THESIS

5MF6255: EXCAVATIONS AT AN EARLY ARCHAIC BASIN HOUSE SITE IN THE YAMPA RIVER VALLEY, MOFFAT COUNTY, COLORADO

Submitted by

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WE HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER OUR SPUERVISION BY STEPHANIE SLAUGHTER ENTITLED 5MF6255: EXCAVATIONS AT AN EARLY ARCHAIC BASIN HOUSE SITE IN THE YAMPA RIVER VALLEY, MOFFAT COUNTY, COLORADO BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS.

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ABSTRACT OF THESIS

5MF6255: EXCAVATIONS AT AN EARLY ARCHAIC BASIN HOUSE SITE IN THE YAMPA RIVER VALLEY, MOFFAT COUNTY, COLORADO

Metcalf Archaeological Consultants, Inc., excavated site 5MF6255 in the late summer and early fall of 2006. The site had been discovered during the open trench inspection of Wyoming Interstate Company's Piceance Basin Expansion Project pipeline. As observed in the trench, the site contained a dark cultural stain located about 1.6 m below bladed surface, which was identified as a possible basin house. Its stratigraphic position within a zone of heavy calcium carbonate deposits suggested an age of 7000 BP or greater, placing the site firmly within the Pioneer period of the Archaic era. Very few sites of this age have been excavated in northwestern Colorado, making 5MF6255 important for establishing basic information about this period of prehistory, regardless of whether or not it was a basin house.

A total of 104 complete and partial 1 m by 1 m units were excavated in one large block to explore the contextual integrity of the feature, the nature of the stain, and search for any associated ancillary features. Results of excavation revealed the site consisted of three basin houses, one of which had two rooms, as well as 15 other pit features. A preliminary charcoal sample from the upper layers of the south end of the initially identified basin house was submitted for radiocarbon analysis and returned two intercept dates of 7935-8070 cal BP and 8084-8159 cal BP (2-sigma), dating the site to the early Pioneer Period of the Archaic Era. It is one of the oldest basin house known in the northern Colorado River basin area. Cultural material recovered from the site is described, and the research contributions resulting from these investigations are detailed, including its place in the chronology of northwestern Colorado, paleoenvironmental data obtained for the project as a whole is described, settlement and subsistence strategies are discussed, and finally, morphology of both the house features and pit features are detailed. A short comparison of this site to other Pioneer-era sites in the regions is also discussed, placing the site within the context of the larger early Archaic adaptive strategies of the region.

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CHAPTER 1: INTRODUCTION

The Pioneer period of the Archaic era in northwest Colorado is little understood. Few sites of this age (9300-7400 calibrated before present [cal BP]) have undergone excavation, leaving a relatively blank spot in our knowledge of the prehistory of this region. The Pioneer represents a transitional period between the earlier Paleoindian era and the later Settled period of the Archaic. Gaps in our knowledge include general subsistence, mobility strategies, land use patterns, feature morphology, and site function. Most of these data gaps have been identified in the prehistoric context for the northern Colorado River basin (Reed and Metcalf 1999).

Site 5MF6255 was one of several sites excavated as a result of the Wyoming Interstate Company's (WIC) Piceance Basin Lateral pipeline project. This pipeline stretches from the Greasewood compressor station in the Piceance Basin southwest of Meeker, Colorado, to the Wamsutter compressor station just outside Wamsutter, Wyoming. For the most part, this pipeline follows a route already established in the early 1990s by the Uinta Basin Lateral (UBL) pipeline. Numerous sites were discovered as part of the initial survey and later monitoring phase of the pipeline construction along the UBL pipeline route during the course of the archaeological investigations undertaken for compliance with federal statutes, specifically Section 106 of the National Historic Preservation Act (NHPA), as amended (Pennefather-O'Brien et al. 1992). As a result of these preliminary studies, 27 sites were excavated, and the information from them filled in numerous data gaps for all periods (MacDonald n.d.). Consequently, research questions for the Piceance Basin Lateral and parallel Rocky Mountain Express (REX) pipelines were more directed and focused.

The research design and data recovery plans for the current project were developed by Reed and Metcalf (2006) with an emphasis on filling in the gaps identified in the prehistoric context (Reed and Metcalf 1999). One area of interest included all aspects of the Pioneer period, as so few sites of that age have been investigated in the region. Site 5MF6255 was discovered during the open trench inspection of the Piceance Basin Lateral at a depth of over 1 m and within sediments heavily laden with calcium carbonates. Based on the geomorphological model developed for the region (Metcalf and McFaul 2006), these indicators suggested an age of 7000 years or older for the occupation, making excavation of this site a high priority since it was relatively dated to the Pioneer period. As a result, 5MF6255 was selected for post-construction data recovery.

This site is a residential camp that consisted of three basin houses and 15 internal pit features. Radiocarbon assays from one feature from each house date the site to about 7800-8200 cal BP, well within the Pioneer period. There is evidence of reoccupation of the houses, which can provide data about the mobility strategies employed during this early period. Additionally, abundant leporid bone and limited macrofloral remains were recovered, providing information about subsistence. Artifact distribution patterns and debitage and tool assemblage characteristics give evidence of site function. Finally, the morphology of the features, both basin houses and thermal pits, indicate a possible evolution of feature construction and use, particularly as compared to other sites in the general region, from earlier, later, and contemporaneous periods. These are the areas of interest for this period, as noted earlier.

This thesis is an in-depth description of a single Pioneer-age site that consists of architectural features, which are not known to have been common until the Settled period of the Archaic. One important question asked in Colorado archaeology is how early in time do these basin houses appear. This is an important aspect to understanding the transition from the earlier, highly mobile Paleoindian lifestyle to the later, more seasonally scheduled Archaic lifestyle. The presence of basin houses indicates people were returning to a *specific* location on the landscape, not just a general area as was the case in the Paleoindian. One model for the use of basin houses in the general region is that these structures were utilized as storage for food stuffs gathered during the warmer seasons and then later utilized in the colder seasons when the houses were occupied. What is unknown is how early this pattern of procurement was adopted and how often during the annual rounds these houses were occupied, thus providing data for models of subsistence and settlement patterns. Because site 5MF6255 represents an occupation that occurred over a limited period of time, suggestive of a single family group utilizing the area, some of these questions can begin to be answered.

This thesis will look at this site from a culture historical perspective in order to lay a baseline of data for subsequent research, without which comparisons of lifeways between periods and within the period would be difficult. In the current body of work, I will present the known culture history of the region, based largely on previous documents, most notably the prehistoric context compiled by Reed and Metcalf (1999), with a special emphasis on the Paleoindian era through the Settled period of the Archaic era. This is done to better understand the differences and/or similarities to the earlier and later periods and what is known about the Pioneer period. I will then present the results of excavation and describe the culture material recovered from the site. Finally, I will compare this site with other known sites in the region that date to the Pioneer period to identify 5MF6255's place in northwestern Colorado prehistory. The areas of interest include cultural chronology, the paleoenvironment, seasonality, site function, feature morphology, and settlement patterns. On its own, 5MF6255 does not provide much information about this last subject, however, when compared to other sites in the immediate area and the general region, it can show how the landscape was utilized by people during this early period of the Archaic.

SITE SUMMARY

Site 5MF6255 is a newly recorded basin house site that was excavated by Metcalf Archaeological Consultants, Inc. (MAC) in the late summer and early fall of 2006. It was discovered during the open trench inspection (OTI) for WIC's Piceance Basin Expansion pipeline project, which was constructed in the winter of 2005-2006. The site is located on a terrace on the north side of the Yampa River and just east of Spring Creek in Moffat County, Colorado (Figure 1). The town of Maybell, Colorado is approximately two miles to the southwest. The site consisted of two features, a basin hearth, labeled Discovery no. 4586 + 20 and a dark, basin-shaped, cultural stain, labeled Discovery no. 4586 + 93, which was about 22 m south of the hearth feature. The features were numbered based on their location in relation to the engineering stations marked for the pipeline construction. The first number designates the Engineering Station (E.S.) and the second number indicates the distance in feet south of the E.S. Therefore, Discovery

Figure 1. Location of site 5MF6255

no. 4586 + 93 indicates the feature was located 93 feet south of E.S. 4586. No surface manifestation of the site was present. The site measures 40 m by 15 m. The basin-shaped stain was present in both walls of the trench, with the thickest portion in the east wall (Figure 2 and Figure 3). Stratigraphically, this stain was located in sediments that were heavily laden with calcium carbonate deposits. In the study area, these heavy deposits developed over a long time and are generally an indicator of an age 7000 BP or greater (Reed and Metcalf 2006:51). The combined treatment plan for post-construction work on the site developed by Alpine Archaeological Consultants, Inc. (Alpine) and MAC prescribed a block excavation of units up to 100 m^2 in size, over the deeper cultural stain, with the majority of units placed on the east side of the trench (Reed and Metcalf 2006).

The final excavation block measured 104 m^2 in size. Excavation yielded 777 pieces of lithic debitage, 37 chipped stone tools (including eight patterned bifaces, 26 flake tools, one core, two tested cobbles), 56 pieces of ground stone, one hammer stone, 11 minimally modified cobbles and pebbles of unknown function, eight manuports consisting of several round sandstone rocks as well as large, unmodified sandstone and quartzite cobbles, 8,618 unmodified faunal remains, and one bone tool. Quantities of fire-cracked rock (FCR) were low, at a mass of 10,001.7 g. Bone was abundant, particularly from the lower levels of the excavations, and highly fragmented. In addition, 12 pit features, three possible postmolds, and three basin houses were discovered. Samples submitted for ancillary studies include charcoal for radiocarbon dating from floor features in each of the houses, an obsidian flake for X-ray fluorescence (XRF) source analysis and obsidian hydration dating, numerous flotation samples from all

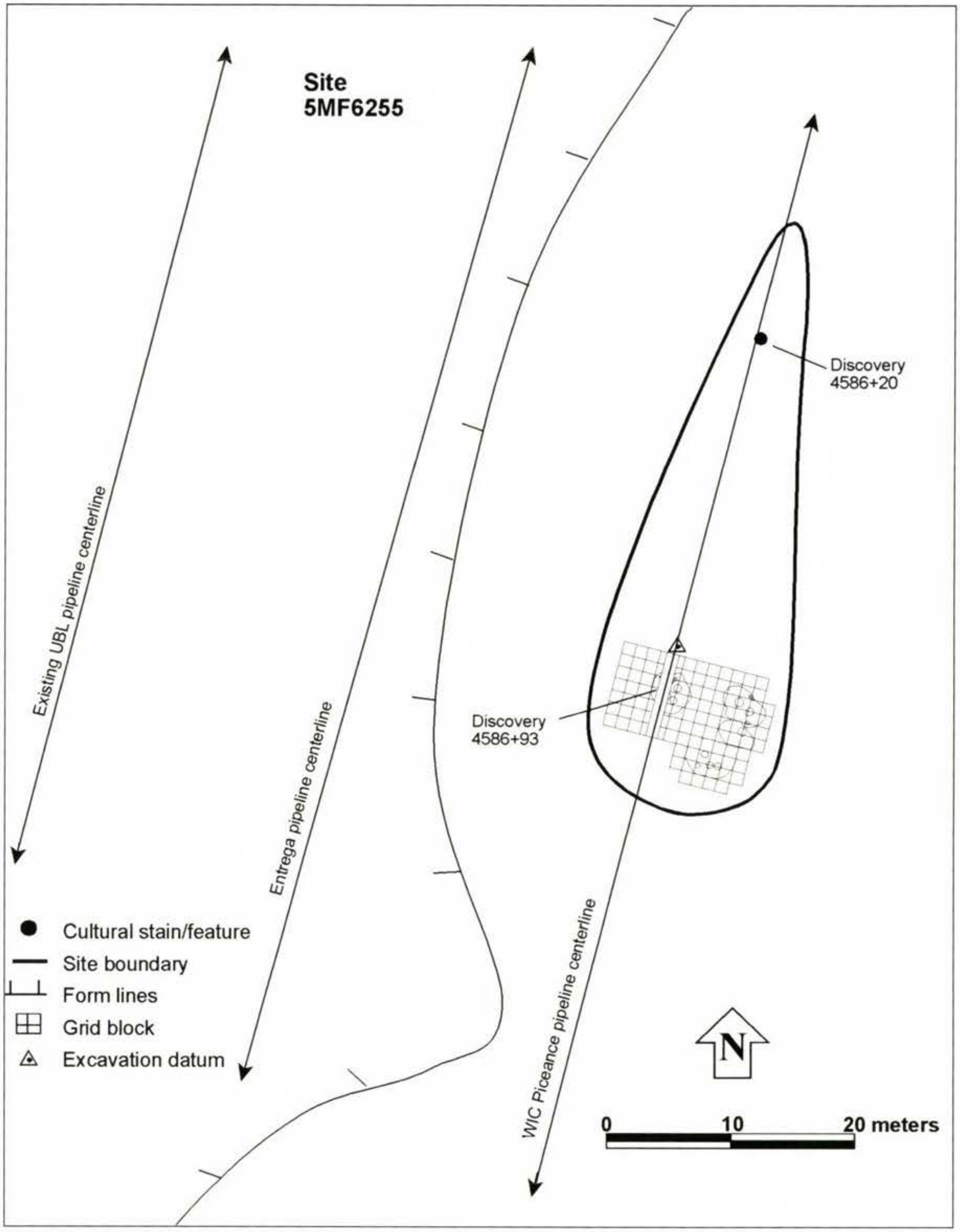


Figure 2. Site map of 5MF6255

Figure 3. Overview of site facing northwest (Roll 06-252, image 051)

features, pollen analysis from the acid wash of five ground stone tools, and two pieces of FCR were submitted for fatty acid residue and lipid analysis. Because of the projected age of the site, it was recommended as eligible for inclusion on the National Register of Historic Places (NRHP).

In Chapter 2, I present the administrative information about the site, including a description of the effective environment, the general geology of the landscape, plant and animal resources present in the current environment, and a history of the site investigations. Chapter 3 covers the culture history of northwestern Colorado. The Paleoindian era, Pioneer period, and Settled period of the Archaic era are covered in some depth to establish a base against which the results of this research will be compared. The following Transitional and Terminal periods of the Archaic, Formative, and Protohistoric eras are briefly summarized. Chapter 4 presents the methodologies utilized for this project, both in the field and the laboratory. Specific attributes that were analyzed for lithic debitage, chipped stone tools, and non-chipped stone artifacts are defined and described. In Chapter 5, I describe the sediment and cultural stratigraphy to gain a better understanding of site formation and preservation, as well as the chronology based on radiometric analysis and diagnostic projectile point typology. Chapter 6 describes the results of excavation, including all artifacts recovered and features discovered; Chapter 7 describes the results of the ancillary analyses, including faunal analysis, macrobotanical remains, pollen wash analysis from select ground stone tools, and the analysis of fatty acid compositions of archaeological residues. Spatial analysis of artifact distributions allowed for the identification of activity areas specific to each basin house. Chapter 8 discusses these activity areas and the possible functions of each house based on the results of artifact analysis. Chapter 9 covers the contributions to regional research that excavation and analysis of 5MF6255 provides. The end of the chapter will place site 5MF6255 within the larger region with respect to other Pioneer-age sites. In addition, a quick comparison of pit feature morphology of these same sites is made in order to determine if the simple, unlined basins discovered at 5MF6255 are characteristic of pit features in the Pioneer period and what, if anything, can be learned about settlement patterns and subsistence, particularly in relation to the earlier Paleoindian era and later Settlement period. Finally, Chapter 10 discusses the possible chronology of events that led to the formation of 5MF6255 and how the site compares to the earlier and later periods. I will also discuss how this site increases our understanding of this early period in prehistory and how we will have to revisit our preconceptions of Paleoindian adaptations, particularly as that earlier era transitioned into the Archaic.

CHAPTER 2: EFFECITVE ENVIRONMENT AND HISTORY OF SITE INVESTIGATIONS

INTRODUCTION

This chapter will cover the general information about the site. Subjects include the modern environment of the region, a short history of site investigations, and acknowledgement of the field and laboratory personnel involved in the project. This basic information is to provide a context for the site, particularly its place currently on the landscape. A description of the present environment can then be compared to the environment of the past, which will be presented in Chapter 9, allowing for understanding how the landscape has changed over time, affecting site formation, and to give some idea of how the landscape appeared during occupation of the site. The last section of this chapter acknowledges the work of both the field personnel who assisted in the excavation of the site, as well as the laboratory personnel who conducted the analyses of artifacts and ancillary studies. A list of the appendices is also provided for reference.

SITE SETTING AND EFFECTIVE ENVIRONMENT

The site is located on an older terrace of the Yampa River system on the north side of the river. Spring Creek, a major, south-flowing tributary of the river, is found to the west. The underlying geology of the region is modern alluvium along the river, with Miocene-age sandstones and siltstones of the Browns Park Formation leading up from the river (Tweto 1979). Surface sediments are generally a fine-grained brown aeolian and colluvial sand with limited amounts of gravels and small cobbles. Layers of calcium carbonate deposits are visible in the walls of deeply entrenched side drainages in the area; the carbonate deposits become denser with depth.

The highest elevation in the area is Coal Mountain near Deception Creek to the south, at 2457 m above mean sea level (amsl), and the lowest elevation is 1792 m amsl along the Yampa River just to the west of the town of Maybell. Site 5MF6255 lies at an elevation of 1817 m amsl. The area is characterized by rolling hills and ridges at an elevation of about 1800 m amsl. Juniper Mountain is the most prominent landmark to the south of the site and the summit is at an elevation of 2400 m amsl.

Vegetation in the area is dominated by sagebrush scrub. Low sagebrush covers the hills, with taller sagebrush in the drainages. The nearby hills are covered in open juniper woodlands. The understory is composed of various bunch grasses, prickly pear cactus, and forbs. Packrat midden studies conducted for the Piceance pipeline project (Madsen et al. 2009) indicate that the vegetation community has changed little over the last 4000 years, with the exception of Utah juniper (*Juniperus osteosperma*) (Table 1). This plant species is abundant in the middens but is absent from the present environment.

Modern fauna in the region include, but are not limited to large mammals such as elk, mule deer, black bear, and mountain lion. Medium-sized mammals include coyote, bobcat, badgers, raccoons, and lagomorphs such as cottontail rabbits, snowshoe hare, and jackrabbit. Smaller mammals include various rodents such as mice, pocket gophers, voles, and squirrels. Bats are also present. Numerous bird species utilize the area and include Canada goose, sage grouse, wild turkey, various species of ducks, and sandhill cranes. Several reptiles, such as snakes and lizards, as well as amphibians like frogs,

Table 1. Plant species common in the area

Common Name	Scientific Name
Aster family	Asteraceae
Bitterbrush	*Purshia tridentata*
Creeping barberry	*Berberis repens*
Dusty maiden	*Chaenactis* sp.
Four-wing saltbush	*Atriplex canescens*
Gambel oak	*Quercus gambelii*
Goldenrush	*Haplopappus* sp.
Goosefoot	*Chenopodium* sp.
Grass family	Poaceae
Horsebrush	*Tetradymia canescens*
Mallow family	Malvaceae
Mountain mahogany	*Cercocarpus ledifolius*
Pea family	Fabaceae
Prickly pear cactus	*Opuntia* sp.
Rabbitbrush	*Chrysothamnus* sp.
Rice grass	*Achnatherum hymenoides*
Sagebrush	*Artemisia tridentata*
Saltbush	*Atriplex* sp.
Shadscale	*Atriplex confertifolia*
Skunkbush sumac	*Rhus trilobata*
Tansy aster	*Machaeranthera* sp.
Wild rye	*Leymus cinereus*
Wormwood	*Artemisia dranunculus*

toads, and salamanders are also present. Grizzly bears, gray wolves, beavers, muskrats, and occasional bison were present in the region historically but are not present today.

The modern climate of the region is typically cool and dry, with an annual mean temperature of 5.8° C and annual mean precipitation of 31.01 cm. The coolest month is January, with a mean of -16.3°C, while the warmest is July with a mean of 30.7° C (Western Regional Climate Center 2006). The wettest seasons are spring and winter, with a mean of 8.97 cm in the spring months and 8.79 cm in the fall months. Mean snowfall for the area tends to fall in December and January, with 30.99 cm of snow (Western Regional Climate Center 2006). The town of Maybell, at an elevation of 1804 m amsl and similar to 5MF6255, sits in a cold-air sink where winter temperatures have reached -51.7° C. The mean winter temperatures are -6.7° C. Summer temperatures have reached a high of 38.9° C, although the mean temperature is 17.8° C. These values are for the years 1958 to 2006 and taken from the weather station located near Maybell, Colorado (Western Regional Climate Center 2006).

The site has been impacted by the construction of the current WIC Piceance Basin Lateral pipeline, which intersected the initially discovered basin house. Existing disturbances in the area also include two other pipelines, the UBL and the REX, both of which parallel the WIC pipeline to the west. Surface disturbances include a pipeline access road, erosion, and trampling by livestock and wildlife.

HISTORY OF SITE INVESTIGATIONS

This newly discovered site was identified by MAC in 2006 during the construction phase of the project and was marked for subsequent return and investigations. Two cultural stains were identified in the trench, Discovery 4586+20 and Discovery 4586+93. The first feature (Disc. 4586+20) is a basin hearth found in the east wall of the trench. It measures 70 cm wide by 30 cm thick and is approximately 60 cm below bladed surface (cmbbs). It lies above the carbonate enriched sediment level that indicates an early Archaic age. The feature was not further investigated and is reported in the monitoring report for Colorado (Elkins and Nelson 2009). Approximately 22 m to the south of the basin hearth was Discovery 4586+93, a basin-shaped cultural level observed in both walls of the pipeline trench, but much thicker in the eastern wall. At the time of discovery, the stain measured 7 m in length and was 70 cm thick, lying about 100 cmbbs and within the carbonate enriched sediment level. The focus of excavation at this site was on this feature, the results of which are reported in this thesis.

RESEARCH GOALS

The research goals for this site were to extend our understanding of the early prehistory of the region. The first goal was to establish the nature of the stain in the trench, to determine if it was a basin house. The second goal was to establish the date of the feature, which would structure the subsequent excavation at the site. Third was context, to establish if there were any additional, associated features, and their function(s). If the feature was indeed a basin house and dated to the suspected 7000 years BP or earlier, then it would represent one of the earliest known basin houses in northwestern Colorado. In this case, all information gained from excavation is important, including feature morphology and function, subsistence, technology, and settlement patterns since currently there is very little information on basin house sites that date to the Pioneer period in this region. The results of excavation at this site can be used to answer questions about cultural continuity and differences between the preceding Paleoindian and the later Archaic eras (Reed and Metcalf 2006:51-54).

PERSONNEL

Field work was conducted from August 22 to October 24, 2006. Stephanie Slaughter was site crew chief. Crew members included Corrine Camuso, Mike Carlisle, Susan Dale, Heather Drought, Caroline Klebacha, Beecher McGee, Adam McManus, Eilis Monaghan, Amy Nelson, Noah Oliver, Chad Pitner, Kelly Pool, Naomi Rintoul, Hanna Romes, John Walker, and Garrett Williams.

Geomorphological investigations were conducted by Michael McFaul of LaRamie Soil Services (Appendix A). Identification of pollen from ground stone samples was conducted by John G. Jones, Ph.D., Department of Anthropology, Washington State

University (Appendix B). Fatty acid residue analysis was conducted by Dr. Mary Malainey and Timothy Figol (Appendix C). Radiocarbon dating services were provided by Beta Analytic, Inc. and Dr. Scott Lehman, Chad Wolak and Patrick Cappa at the Institute of Alpine and Arctic Research (INSTAAR) Laboratory for AMS Radiocarbon Preparation and Research (Appendix D). Obsidian sourcing using non-destructive energy dispersive x-ray fluorescence spectrometry was performed by Dr. Richard Hughes at the Geochemical Research Laboratory (Appendix E). Obsidian hydration dating was performed by Tom Origer at Tom Origer & Associates (Appendix F). Macrofloral remains were analyzed by Abbie Bollans of Alpine Archaeological Consultants, Inc. (Appendix G). Jennie Borresen Lee of MAC provided analysis and identification of faunal remains (Appendix H). Jenny Stahl, with the assistance of Stephanie Slaughter and Alie Graver of MAC, analyzed the chipped stone artifacts, and Jenny Stahl created summaries of artifact analyses (Appendix I). Stephanie Slaughter of MAC analyzed the non-chipped stone artifacts. Amy Nelson drafted the majority of the plans and profiles as well as the site sketch map, Gail Lincoln performed some data entry and took artifact photos, and Molly Boeka-Cannon produced artifact distribution maps. The artifact catalog is included in this thesis as Appendix J. All collected materials, notes, and photographs will be curated at the Museum of Northwest Colorado in Craig, Colorado.

SUMMARY

This chapter has described the current environment around the site, including the dominant vegetation and resident animals. The environment during the time of occupation was likely very similar to that of today, with sagebrush dominating the terraces and hillsides, and conifer trees such as juniper present in the higher elevations.

Likewise, animal communities were probably similar as well, with notable absences of a few species, as noted above. The elevation of the area, combined with the current temperature gradients and moisture regime is critical to understanding the use of the landscape in the past, in particular the proposed season of occupation of 5MF6255, which is described later in Chapters 9 and 10. Additionally, the species that comprise the animal and plant communities are affected by temperature and especially available moisture, which can help to explain subsistence choices in the past.

The next chapter will cover the culture history of northwestern Colorado. Special emphasis is paid to the Paleoindian and Archaic eras to provide a backdrop against which 5MF6255 will later be compared. The remaining eras of prehistory, the Formative and Protohistoric, are briefly described.

CHAPTER 3: CULTURE HISTORY

INTRODUCTION

The culture history of the region has been well summarized in numerous other documents. The following is a short synthesis of this work, largely taken from the Northern Colorado River Basin prehistoric context by Reed and Metcalf (1999), although other work is recognized (Stiger 2001; Thompson and Pastor 1995).

The prehistory of the region is divided into four main eras, the Paleoindian, Archaic, Formative, and Protohistoric, which are further subdivided into periods (Table 2). The eras and periods of interest to this study are the late Paleoindian era, the Pioneer period of the Archaic era, and the Settled period of the Archaic. The other eras and periods will be briefly summarized, with more detail provided for the above-mentioned periods. The divisions for these eras are based mainly on changes in projectile point morphology, along with visible changes in subsistence and settlement practices. For the most part, the dates that serve as beginning and end points are arbitrary since the region displays a great amount of continuity with changes accumulating slowly over time, and there are no single defining characteristics of each period (Reed and Metcalf 1999:71). The discovery of 5MF6255, with its three basin houses, does provide a defining characteristic of the Archaic era, since it is within this era that the highest numbers of basin houses are known (Larson and Francis 1997; Reed and Metcalf 1999; Shields 1998).

Table 2. Culture historic eras and dates (adapted from Reed and Metcalf 1999)

Era	Period/Tradition/Phase	cal. BC and AD	Uncalibrated BP	cal. BP
Paleoindian	Clovis	11,150-10,950 BC	Pre-8,350	13,100-12,900
	Folsom	10,950-9,850 BC		12,900-11,800
	Late Paleoindian	9,850-7,350 BC		11,800-9,300
Archaic	Pioneer	7,350-5,450 BC	8,350-6,450	9,300-7,400
	Settled	5,450-3,150 BC	6,450-4,550	7,400-5,100
	Transitional	3,150-1,150 BC	4,550-2,950	5,100-3,100
	Terminal	1,150 BC – AD 150	2,950-1,950	3,100-2,100
Formative	Aspen	AD 150-1,300	1,950-650	2,100-650
Protohistoric	Antero Phase	AD 1,300-1,880	650-300	650-70
	Canalla Phase		300-130	

PALEOINDIAN ERA

The Paleoindian era is defined from 13,100-9,300 calibrated (cal) BP and is divided into three periods. This era is characterized as a time of highly mobile, big-game hunters, largely based on work by Frison (1991) and others (i.e., Kelly and Todd 1988) for the Northwestern Plains.

Architecture

A few structures are known from this period (Stiger 2006; Stiger and Bjornstad 2002; Wheeler and Martin 1984). These are located on sites in higher altitudes and suggest the presence of early ephemeral structures, although the evidence for these structures is inconclusive. The general lack of substantial, archaeologically visible habitation structures suggests highly mobile people who did not stay in one location long or often revisit them. One exception is Middle Park, where there is evidence of resident populations who established a strong presence in this location (Reed and Metcalf 1999; Surovell et al. 2001a). With the few ephemeral structures mentioned above, no storage pits have been discovered, although caching behavior is known, particularly for tools and raw materials.

Lithic Technology

Technologically, the Paleoindian era is distinguished from later eras by well-made hafted bifaces, generally large, lanceolate points characterized by basal grinding along the hafting element. Some bifaces were fluted, such as Clovis and Folsom, while others were not, such as Goshen. Late Paleoindian points tend to be stemmed with indented bases (Reed and Metcalf 1999). Typically, high-quality materials that were exotic to the locale were used (Bamforth 2009; Kelly and Todd 1988; Meltzer 2009; Reed and Metcalf 1999), although the lithic assemblage from some sites in the mountains, such as the Barger Gulch Folsom locality (5GA195) were almost exclusively the local Troublesome chert formation material (Surovell et al. 2001b).

Subsistence and Settlement Patterns

The procurement of animal protein, with little emphasis on the acquisition of floral resources, was the focus of economic and subsistence activities. One proxy for this conclusion is the general lack of ground stone tools on most known Paleoindian-age sites, although some evidence suggests that plant materials were exploited, though not as intensively as in later eras (Meltzer 2009; Reed and Metcalf 1999). Reliance on big game is based on kill sites that were dominated by an extinct species of bison. This archaeological focus on kill sites has skewed the record to large game procurement, however, as evidence from other sites indicates small to medium-sized mammals were exploited as often, if not more often, particularly in areas such as the mountains (Meltzer 2009; Reed and Metcalf 1999). A general lack of large bison herds in these environments, which supported only smaller groups of the grazers, likely forced humans to focus on the smaller mammals.

Overall, the evidence for Paleoindians in northwestern Colorado is extremely limited. Models for behavior, subsistence, and settlement patterns are generally based on work from other areas (Reed and Metcalf 1999). Few sites of this age have been excavated, and settlement models tend to be based on the distribution of isolated projectile point finds. One exception is Middle Park, where Barger Gulch, a Folsom-age site, has been subjected to extensive and long-term investigations (e.g., 5GA195, Surovell et al. 2001a). The evidence from this area suggests a slightly more sedentary lifeway, where people exploited a wide range of resources available at the different elevation levels on a scheduled basis, which is more similar to an Archaic, broad-spectrum subsistence adaptation.

Foothill-Mountain Tradition

The Foothill-Mountain Tradition is a late Paleoindian adaptation and is recognized in the northwestern portion of Colorado, as well as southwestern Wyoming (Frison and Grey 1980; Thompson and Pastor 1995). Differences between the Foothill-Mountain tradition and earlier Paleoindian traditions are focused on subsistence and settlement patterns. Projectile points identified as Foothill-Mountain Tradition tend to be made from local materials, and the morphologies are more variable. Pitblado (2003) posits that this could be the result of full-time residents in the mountains, while the limited presence of more wide-spread types, such as Jimmy Allen/Frederick types or Great Basin Stemmed points, indicate seasonal users of the high country from the Great Plains to the east and sporadic use by groups from the Great Basin and Colorado Plateau to the west. The full-time residents of the Southern Rocky Mountains were uniquely adapted to the environments of the mountains and made unique weapons, while the seasonal occupants or occasional visitors left behind points that are morphologically more similar to points common in the adjacent regions (Pitblado 2003). Fewer bison bones have been recovered, with more of an emphasis on medium-sized mammals such as mule deer and pronghorn. The models proposed indicate that subsistence should be more broad-based and include more floral resources, and there should be evidence of more substantial residential structures, which the emerging evidence seems to bear out (Reed and Metcalf 1999:67).

ARCHAIC ERA

The Archaic era dates from 9,300 to 2,100 cal BP and is divided into four periods, the Pioneer, Settled, Transitional, and Terminal periods. The beginning and end dates for these periods, as with the eras in general, are relatively arbitrarily based. The changes from the earlier Paleoindian era are more pronounced than from later eras, although there is a great degree of continuity, particularly from the late Paleoindian, Foothill-Mountain tradition into the Pioneer period of the Archaic.

The Archaic era is defined as different from the Paleoindian era based on changes in subsistence adaptations and the attendant difference in settlement systems. Subsistence systems of the Archaic exploited a broader spectrum of animal and plant species, as well as the intensification of use of floral resources. As a result, settlement systems were less mobile, and sites are more visible in the archaeological record. Semi-subterranean houses were constructed, indicating an intention to return to the sites (Kent 1992; Reed and Metcalf 1999). This presumed intent to return to habitation sites also strongly suggests a seasonal round based on the scheduling of seasonally available plant and animal resources. Plant foods are more visible in the archaeological record, with a much higher incidence of ground stone tools, indicating more intensive food processing, as well as the construction of pits with slab linings or rock-filled for roasting or boiling food resources.

Technologically, projectile points are smaller than earlier Paleoindian counterparts and tend to be notched either on the sides or corners. There is also a fluorescence of styles, with a much higher degree of variability noted in the morphologies of the projectile points throughout the Archaic era. It has been speculated that this dramatic increase in variability is the result of a "settling in" process, whereby resident populations were far less mobile than their antecedents. With less mobility was less opportunity for contact with outside groups, and thus exchanges of ideas and technology, and less opportunity for establishing trading partners (Reed and Metcalf 1999). Additionally, point styles could have been utilized to define group boundaries and group affiliations (Weissner 1983, 1984).

The Pioneer period of the Archaic in Colorado has fewer recorded and investigated sites than other time periods, similar to the general region (Thompson and Pastor 1995). The fully nomadic lifeway was replaced by a higher degree of sedentism during this period. Full-time occupants of the region are also visible in the archaeological record.

The Settled period saw a fluorescence of local groups, indicated by the increased variability of tool morphologies and styles. Increased numbers of more highly stylized features, such as slab-lined and rock-filled pits, are noted during this period. The settlement system appears to have been focused on central-place strategies, where predictable winter habitations were utilized as storage during the productive months of the year, such as at the Yarmony site (Larson 1997; Metcalf and Black 1991, 1997; Reed and Metcalf 1999). According to the available archaeological data, semi-subterranean pit structures became established during the Settled period (Reed and Metcalf 1999:79; Shields 1998).

There was an increase in the variability of material culture, less sedentism and more mobility, and more seasonality in the use of the higher elevations during the Transitional period. During the last period of the Archaic, the Terminal, there is some evidence of an early introduction of bow and arrow technology and use of corn. Subsistence strategies included intensification of the utilization of seeds and other lower ranked food resources.

Since this thesis is most concerned with the Pioneer period of the Archaic, it is important to review what is known about four areas of interest for the Archaic era, in order to better place this study in proper perspective. The four areas that are generally considered most important to understanding this system include architecture, morphology and function of pits, projectile point morphology and lithic technology, and subsistence and settlement patterns. While these are certainly not the only areas through which we can gain an understanding of cultural systems, it is through studying changes, and as importantly continuity, in these subjects that we can gain some understanding of adaptive systems in prehistory in northwestern Colorado and beyond.

Architecture

Architecture generally refers to structures that were constructed for a variety of functions, including residences, as well as storage in later periods. The most characteristic architecture of the region during the Archaic is the basin house. The oldest structures known in the region are at Windy Gap in Grand County and date to 7950 BP (uncalibrated [uncal]) (Shields 1998; Wheeler and Martin 1984). By 6250 BP (uncal), houses are well-established in the region (Reed and Metcalf 1999). The key definitions of formal houses include some evidence of labor investment and that the structure appears to have been intended for long-term use rather than temporary use, such as with a conical brush structure such as a wickiup. Basin houses are the most abundant type of architecture in northwestern Colorado, for which Shields (1998) compiled a list for his thesis project. He included the Yarmony house in his list, although the houses at Yarmony are the most formal type of house defined for the region. The most numerous basin houses are located in the Yampa River valley, and the majority of these are less formal.

The oldest architecture in northwestern Colorado is the Granby site (5GA151), which included abundant burned mud-and-post impressions in an arc pattern. These impressions have been interpreted as wattle-and-daub structures of some sort. The next oldest structures are in the Curecanti region. Again, these structures were characterized by post holes and stained areas with radiating poles. These have been interpreted as wickiups (Stiger 2001; Reed and Metcalf 1999). Notably, these early structures were fairly ephemeral and above-ground constructions. The oldest recorded semi-subterranean houses in the region include Yarmony, which dates to about 6250 BP (uncal), and a house discovered near the base levels of Red Army Rockshelter, dating to approximately 7300 BP (uncal). The pertinent question asked by the current study is how early semi-subterranean structures were built and how formalized were they.

Pit Features

Pit features include thermal pits and storage pits. While tool caches are known in the Paleoindian era, and food caches have been theorized to have been entire carcasses of prey animals left to the elements (Frison 1992; Meltzer 2009), no other formalized storage pits, especially for food, have been identified for the Paleoindian era. Thermal pits appear to have been simple hearths, barely recognizable in the archaeological record as stains or shallow basins. These features were very expedient, with little effort expended to prepare them. Expedient hearths are defined as "those with relatively short-lived and generalized purposed, with an apparent lack of extensive construction or preparation for use" (McKibbin et al 1989:49, 264). Their functions included a fire for light, heat, and cooking. During the Archaic era, pits became more formalized and apparently specialized. Pits have been excavated fairly deeply, sometimes with straight sides, other times basined, but with an obvious expense of some effort to dig them. Slab-lined pits as well as rock-filled pits are most visible starting in the Settled period, although slab-lined pits are present, albeit rare, in the Pioneer period. These rock-lined and rock-filled pits were utilized for a variety of functions such as roasting roots, and other floral resources; as a source of heat since rock-lined pits retain heat more adequately than unlined pits; roasting meat, possibly for meat drying (Bach 2009; Walker 2004); stone boiling; and as storage pits. There was at least one slab-lined pit at the Yarmony site that was interpreted as storage. It did not appear to have been fired. Other slab-lined pits in the region have oxidation rinds outside of the rocks, indicating the pits had been utilized as thermal pits, although this function does not exclude their later use as storage pits. Slab-lined pits are labor intensive and Smith and McNees (1999) hypothesize that the groups who dug and utilized these pits intended to return to them. The upright slabs tended to be above ground, making their relocation at a later time, sometimes years later, much easier.

Lithic Technology

Projectile points are subsumed into this subject. Point morphology is one of the attributes utilized to distinguish the different eras, although not necessarily the different periods of the Archaic. As Reed and Metcalf state, "It appears that few Archaic-era point forms have usefully restricted temporal or spatial limits in their distribution" (1999:83). As stated earlier, points in the Archaic tend to be notched, either corner- or side-notched, they are generally large to medium in size, and were made from more locally available materials. This last point is an important distinction between the earlier Paleoindian era and the later eras in the prehistoric. Paleoindian sites are dominated by non-local, exotic materials, particularly the point assemblages. Evidence from Middle Park indicates that by the Late Paleoindian period, people were focusing on obtaining materials for projectile points from more locally available sources (Pitblado 2003; Surovell 2001a). During the Archaic, this trend continues, with local materials dominating both the debitage and chipped stone tool assemblages. All this indicates is the continuation of the "settling in" and also potentially smaller territories as people utilized what was available in the local landscape.

Subsistence and Settlement

The environment at the end of the Pleistocene was undergoing changes that resulted in smaller animals, smaller herds due to less carrying capacity of the landscape, and changes in movements as the herds followed the more seasonally available resources. At the same time, human populations were apparently expanding while the ability to move with the herds became more difficult due to animal population changes, as well as apparent competition with other human groups in adjacent territories. Reliance on a diverse set of resources in a more limited area became more important as territories became restricted (Reed and Metcalf 1999:88). These changes led to lower reliance on the highly mobile large game and a focus on more locally available resources, including plant foods. This change is known as the "settling in" process mentioned earlier. Groups became more reliant on local resources and the higher elevations became more accessible due to the retreat of the glaciers.

One of the keys to understanding prehistoric decisions on resource exploitation is the knowledge that winter survival would allow for fully residential populations in northwestern Colorado (Larson 1997; Reed and Metcalf 1999). This survival was dependent on being able to exploit all available resources in a given territory. As climatic conditions ameliorated after the end of the Pleistocene, glaciers in higher elevations retreated, allowing for access to these areas. Higher elevations are rich in resources, which are highly predictable and compressed in territory and seasonal availability. These resources, however, are limited by severe winter conditions. The lower elevations, which could be continually exploited, were less rich in resources and less predictable. They were, however, available for more of the year (Reed and Metcalf 1999).

The seasonal scheduling of higher resources meant there was a need to plan ahead, and storage of gathered food resources became critical. This planning meant transport costs had to be balanced against scheduling. Three strategies have been hypothesized. One was to send out parties to bring resources back to a home base for processing and storage. The disadvantages were high transport costs and the family groups were separated. Another strategy was to move the entire group through the area as resources became available. An advantage was proximity to high quality resources and low transport costs, however, there was limited storability in this strategy. The third strategy was one in which a central place was selected as a good wintering spot, then both high and low elevations could be exploited as the resources became available. Transport costs remained low, the group stayed together, and the food resources were stored in the place where the group would overwinter. The disadvantage was that there are few places in northwestern Colorado where this type of exploitation was possible (Reed and Metcalf 1999).

Apparently, all of these strategies were utilized, with one line of evidence being the presence of slab-lined pits interpreted as storage on sites that date to the Archaic. Exploitation of all elevations from a central, winter residence place that served as storage, such as at Yarmony (Metcalf and Black 1991, 1997), were rare. A more likely scenario included exploitation of the lower elevations while utilizing basin houses as storage (Larson 1997).

FORMATIVE ERA

The major changes noted during the Formative era, which dates from 2,100 to 650 cal BP, include the introduction of corn, pottery, and bow and arrow technology. While there is limited evidence that bow and arrow technology, as well as some reliance on corn, was starting near the end of the Terminal period of the Archaic, the Formative is marked by the expansion of these technologies. In northwestern Colorado, there is limited evidence of the presence of corn, but this area is outside of the environment for growing cultigens. Presence of corn may just as likely be the result of trade with southwestern or Fremont groups, whose subsistence strategies shifted to a greater reliance on these cultigens in the Formative era. In northwestern Colorado, subsistence shifts included an intensification of hunted and gathered resources. There was a greater focus on lower ranked foods, including seeds, evidenced by an increased reliance on prepared fire pits for processing foods. Increased numbers of radiocarbon dates suggests higher populations, and a shift in the settlement patterns. The higher elevations continued to be used, but during the warm season, as opposed to the cold seasons during the Archaic. Likewise, basin houses were still the favored type of residence (Reed and Metcalf 1999).

PROTOHISTORIC ERA

The Protohistoric era dates from 650 to 70 cal BP; the end date in northwestern Colorado coincides with the final removal of the Ute to reservations in Utah (Reed and Metcalf 1999). Technological changes in the beginning of the period included a change in point typology from corner-notched arrow points to side-notched and unnotched points. Before the end of the era, stone points were replaced by metal, then eventually by firearms introduced by Europeans and Americans. Native pottery was used until approximately the same period, when metal cooking ware replaced the use of ceramics. The major change came with the introduction of the horse after AD 1680, when the Ute abandoned horticulture and became more highly mobile bison hunters. Residences reflected this higher mobility, with less permanent structures built, generally wooden structures such as wickiups.

SUMMARY

Overall, the culture history of the region is marked by a relatively stable adaptation that lasted for most of prehistory. Evidence from Middle Park indicates resident populations in the mountains of northwestern Colorado as early as the Folsom period of the Paleoindian era, which is generally characterized as a period of highly mobile foragers focused on hunting large game. In these mountain environments, there was more variability in the availability of resources by season, and the various cultural systems reflect this variability. Evidence of structures, both residential and pits, indicates a high investment of time and labor, suggestive of an intention to return to these sites. The first appearance of basin houses, the most common type of residential architecture in northwestern Colorado, was apparently in the Settled period, most notably the Yarmony House site. Site 5MF6255, however, indicates that basin houses were constructed much earlier in time.

Pit features also became more specialized through time. During the Paleoindian era, they were simple and expedient pits, then during the Archaic era, more effort was given to construct these features. In addition, the features were also utilized for more specialized uses, with rock-filled, slab-lined, and rock-lined pits becoming more common later in time. Similarly, the exploitation of food resources expanded in scope and intensity, as more plant foods were added to the diet requiring more specialized and intensive processing. By the time of the end of the Archaic era, seeds were heavily exploited and cultigens were starting to appear in the diet. In addition, small and medium mammals were more often exploited than large mammals such as bison, likely due to the changes in herd movements.

Lithic technology followed this "settling in" trajectory, with more exotic materials used during the Paleoindian period, switching over to more locally available cherts and quartzites used during the Archaic and later. Additionally, projectile points changed as well. During the Paleoindian era, styles of points were common throughout broad areas of the country; however, during the Archaic era, styles became more localized. The fluorescence in point styles has been attributed to the "settling in" process. The subsistence and lithic technology data from site 5MF6255 indicates it followed this pattern, but notably near the beginning of the Archaic era rather than later as the adaptive systems became common.

The next chapter will cover the methodologies utilized for the excavation of 5MF6255, as well as the methods for artifact and bone analysis conducted within the MAC laboratory. Definitions of artifact classes, material types, and analytic terms are provided.

CHAPTER 4: METHODOLOGY

INTRODUCTION

This chapter describes the methodologies utilized for excavating site 5MF6255, as well as the various methods used in the analyses of lithic debitage, chipped stone tools, ground stone tools, and faunal remains. Definitions of the base of excavation, as well as house floors are given, as are definitions of the various analytical terms used. Classes of tools are also defined. The faunal analysis methods are more fully described in Appendix H, although a summary of the methods are provided here.

FIELD METHODS

The work plan developed for 5MF6255 included the excavation of up to 100 1 m by 1 m units in a block, placed on both sides of the pipeline trench and oriented to it (Reed and Metcalf 2006). The focus of the excavations was to the east of the trench, where the majority of the units were excavated. A block of 104 full and partial units was ultimately excavated to reveal the site, with the majority located on the east side of the pipeline trench. The initial units were placed directly over the stain discovered in the trench (F17), and on either side of the trench to capture the entire profile of the possible basin house. Because of the way the grid was planned, these 14 initial units were not complete 1 m by 1 m units. Instead, they were partial units that did not exceed 60 cm in width. A total of 28 full and partial units were excavated on the west side of the trench, and the remaining 76 full and partial units were excavated on the east side (Figure 4).

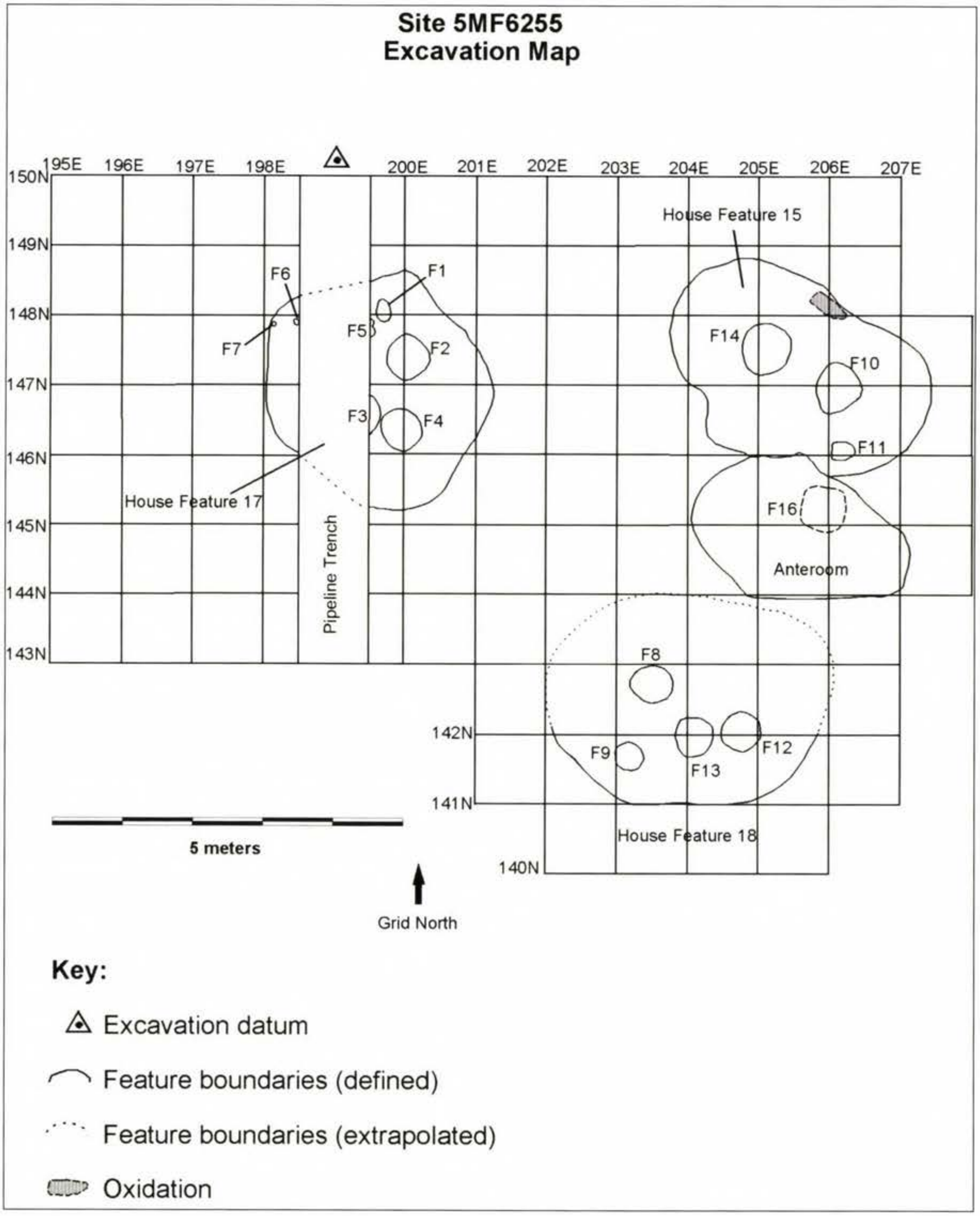


Figure 4. Excavation plan map of 5MF6255

Following construction, MAC emptied the pipeline trench of sediment to reveal the pipe. After it had been visually confirmed to be culturally sterile, the overburden on the projected block was removed with a backhoe to approximately 15 cm above the dark sediment. Approximately 1.5 m of overburden was removed in this manner. The units were hand-excavated with a shovel in flat, 10 cm arbitrary levels until the base of the cultural stain was attained. The base of excavation was troweled and the natural sediment change was followed over the entirety of the block, with the exception of the 14 partial units laid out along the pipeline trench. These units were excavated in flat levels until the stain had been completely removed and was visible in the walls. This was accomplished to reveal a clean profile of the house basin. A laser autolevel unit was used as the site datum, which was located at the north edge of the excavation block, on the east side of the trench. The autolevel was placed on a leveled, concrete cinderblock for stability, which was buried to ground level. All depths were taken below datum from this location, with 0 below datum roughly equal to 0 below surface. Depths below the actual surface are not knowable since the site was discovered in the pipeline trench and all depths were taken from a surface that had been bladed and recontoured. The laser is 19 cm above the base of the unit.

The overburden, which was typically the first 10 cm level of the units, was not screened. With some exceptions, all remaining sediment was passed through 1/4" mesh. In order to control for smaller artifacts not caught in the 1/4" mesh, a constant volume sample consisting of one five gallon bucket from each level in the dark soil was screened from every unit through 1/8" hardware cloth. Artifacts from this sample were combined with the general level. All sediments 10 cm above the floors of the basin houses were also passed through 1/8" mesh. The floors of the houses, as well as the base of excavation, were defined as the interface of the dark cultural soil and the underlying yellow brown sand to clay sand. These interfaces were sometimes hard to determine and extremely mottled, although they were generally slightly more compact than the overlying sediments and were about 50/50 of the dark stain and the lighter, underlying sand.

Floor features were generally recognized when the base of the houses was reached. When recognized, the tops of the features were cleaned to define their extents, they were mapped in plan view, then photographed with both 35 mm color film and a digital camera. Each feature was bisected, the profile was drawn and photographed, and then the other half was excavated. The final excavation of the feature was mapped and photographed, and forms that detailed the dimensions, contents, and form were completed. Approximately 10 L of feature fill was collected from each feature, with the remaining fill screened through 1/8" mesh. Charcoal for AMS radiocarbon assays was collected separately from each of the features, with an emphasis on collecting larger pieces for species identification as well as dating.

When possible, artifacts such as flaked or ground stone tools were point plotted. All other artifacts collected from the screens were bagged in paper or plastic bags and labeled by unit and level. Different artifact classes (i.e., lithics, bone) were bagged separately. Tools were placed in individual bags and labeled. Artifacts collected from the feature fill were also bagged separately. Fire-cracked rock (FCR) was counted and weighed, then discarded. Appropriate pieces from fair to good contexts were collected for lipid analysis. Since minimal quantities of small pieces of FCR were recovered from the features, a few FCR were collected from the floors of the houses. Likewise, ground stone with good contexts and appropriate grinding surfaces were bagged separately for pollen wash analysis, with a pollen control soil sample taken from various locations in the excavation block, generally within the same level below datum.

Once the entire block was excavated and the houses exposed, the floor was mapped and photographs were taken. Profiles of the eastern walls of the units were drawn as the units were completed. Only two individuals profiled the walls to maintain consistency of drawing, and identification and descriptions of the stratigraphy.

LABORATORY METHODS

Once field work was completed, all artifacts and samples resulting from the data recovery were processed in MAC's laboratory. Selected samples were sent off for ancillary studies. All artifacts except those chosen for pollen analysis were washed with water. Feature fill samples were sent to Alpine Archaeological Consultants, Inc., in Montrose, Colorado, for flotation and analysis.

Select ground stone were chosen for pollen analysis. Ground stone were selected based on their provenience and the strength of their association with a feature, as well as the intensity of wear on their use facet(s). The ground stone were washed with a 10% dilute hydrochloric solution, brushed with a clean toothbrush, then rinsed with distilled water. The process was repeated until either the acid solution no longer reacted to the calcium carbonates clinging to the ground surface, or an adequate sample was attained. The resulting liquid was submitted to John Jones of Washington State University in Pullman, Washington.

All notes, forms, and images resulting from the excavation are on file at MAC's office in Wheat Ridge, Colorado. All excavated materials will be curated at the Museum of Northwest Colorado in Craig, Colorado.

LITHIC ANALYSIS

A moderate quantity of chipped stone artifacts was recovered from 5MF6255. In an effort to maximize the amount of effort, time, and interpretive potential, the analysis method utilized was adapted by MAC from the methodology developed by Stan Ahler et al. (1994) for the Lake Ilo archaeological project, which was, in turn, based on research at the Knife River flint quarry (Ahler 1989, Ahler et al. 1994). A detailed analysis of all chipped stone artifacts was made, including both debitage and stone tools. A database (Microsoft Access 2003) was maintained to organize and aid in the interpretation of the results (Appendix J).

DEBITAGE ANALYSIS

The lithic debitage was analyzed first to allow for the identification of previously unrecognized tools. Debitage is the result of a reductive stone tool technology, with no evidence of further cultural modifications. The methodology used here combines two methods, mass analysis and flake typology. Mass analysis focuses on counts and weights of flakes with and without cortex, as well as by size grade. This allows for recognition of patterns of function in large assemblages. In this flake typology, flakes are sorted with an emphasis on variables that are direct indicators of the technology used to produce them. These variables include size grade, material type, flake type, presence of cortex, thermal alteration, count, and weight. These categories are described below.

Size Grade

All of the flaking debris was hand-sorted through a series of nested U.S. Standard testing sieves with square stainless steel mesh. The horizontal aperture measurements for each size grade (SG) are given below. A SG-1 artifact will not pass through 25.0 mm mesh, a SG-2 artifact will not pass through 12.5 mm mesh, and so on. Typological and mass analysis was conducted on all flakes SG-3 and above. SG-4 flakes were sorted by material type, presence/absence of cortex, counted, and weighed. Typological analysis of SG-4 flakes was confined to observations for presence of attributes that characterize pressure biface thinning flakes, as well as raw material, presence or absence of cortex, and presence or absence of heat alteration or burning.

SG-1 = 25.0 mm

SG-2 = 12.5 mm

SG-3 = 5.6 mm

SG-4 = 2.8 mm

Lithic Material

Within each size grade, the debitage was sorted by material type. Materials types include those from northwestern Colorado and the Wyoming Basin region, as well as unknown sources. Artifacts made from these materials were assigned to these categories.

Chert. This material is a smooth-grained, opaque cryptocrystalline silicate with no apparent wood structure. Colors vary, but are generally browns and reds. The material type includes Bridger cherts and Morgan-Madison cherts. The Bridger cherts can be brown or gray with light colored streaks, but also a banded type often referred to as "tiger chert". The "tiger chert" variety is generally lighter browns or light grays alternating with bands of dark brown. All varieties are fine-grained. The material is present in outcrops of the Bridger Formation, of which the quarry location closest to 5MF6255 is Sand Wash (Walker-Buchanan and Naze 1993). Morgan-Madison cherts can include a variety of colors, including brown, yellow, pink, red, and white. Grains vary from fine to coarse. The material is present in outcrops of the Morgan and Madison Formations, which occur on Juniper Mountain, Cross Mountain, and several places along the Yampa River, as well as the uplifted areas of Dinosaur National Monument (Walker-Buchanan and Naze 1993).

Chalcedony. This material is translucent, smooth-grained cryptocrystalline silicates of varying colors.

Petrified Wood. This material is generally orange to brown, with the fossilized wood structures retained. It is semi-translucent to opaque.

Quartzite. This material is a coarser-grained, opaque cryptocrystalline silicate of various colors. A few of the flakes were made from a red quartzite that is consistent with Uinta Mountain quartzite, a fine to course-grained quartzite ranging in color from purple to maroon to red to pink. It is present in Pre-Cambrian exposures in the Uinta Mountain Uplift area in northeast Utah and northwest Colorado. Nearby exposures include Cross Mountain, Juniper Mountain, and Cold Springs Mountain, with quality exposures found throughout the Douglas Mountain and Diamond Mountain areas (Walker-Buchanan and Naze 1993).

Basalt. This material is a fine-grained, volcanic material with colors that are usually gray to black.

Siltstone. This material is composed of silt-sized particles in colors that range from tan to brown. It is opaque.

Obsidian. This material is volcanic glass, generally translucent, and colors vary from gray to black.

Cortex

Flakes were also grouped by the presence or absence of cortical material on the dorsal surface, as well as size grade and material type. Cortex is the outer surface of the raw material that has been exposed to chemical and mechanical weathering. It is often rough and sometimes a different color than the interior. Presence of cortex generally signifies primary core reduction, the beginning phase of tool manufacture. Cortex in any amount was coded as "present", while no cortex was coded as "absent".

Flake Type

Flakes were further sorted into types after being sorted by size grade, material type, and cortex. Flakes SG 1-3 were sorted into types, and SG-4 flakes were scanned only for the presence of pressure biface thinning flakes. The remainder were counted and weighed. The flake typology is taken directly from the Lake Ilo laboratory manual (Ahler et al. 1994:126-128).

Shatter. These are pieces of flaking debris that show evidence of cultural modification or fracture, but cannot be oriented to the direction of force, and the dorsal and ventral surfaces cannot be distinguished.

Bipolar Flake. These flakes are produced by wedging initiation with hard hammer percussion. Characteristics include crushing on opposite ends, shattered ridge-like or pointed platforms with little or no surface area, pronounced ripple marks, a lack of a bulb of percussion, an angular and polyhedral transverse cross-section, and a usually parallel-sided form. Some combination of these characteristics must be present to be coded as a bipolar flake.

Percussion Bifacial Thinning Flake. These flakes are either freehand or indirect percussion flakes produced by bending initiation during the later stages of biface manufacture. Flakes must exhibit most of the following characteristics to be included in this category, although they need not be complete: a thin, slightly curved longitudinal cross-section; an expanding shape in plan view; very acute lateral and distal edge angles; feathered flake terminations; three or more dorsal flake scars, usually originating from a direction opposite of the flake itself; a low percentage of cortex (<10%) on the dorsal surface; a thin and wide, faceted striking platform; a lipped platform; and a small, flattened or diffuse bulb of force.

Blade. A blade is an elongated, parallel-sided flake distinguished by a length:width ratio of 2.0 or greater, with parallel to subparallel lateral margins and parallel to subparallel dorsal flake ridges originating from the same direction as the flake itself. These are indicative of the systematic production of flakes from a prepared and specialized core. The cross-section is plano-convex, triangular, rectangular or trapezoidal.

Simple Flake. This non-bipolar flake type is distinguished by zero to two dorsal flake scars, not including small flake scars indicative of platform preparation. A flake does not need to be complete to be included in this class.

Complex Flake. A complex flake is non-bipolar and must have three or more dorsal flake scars, not including small flake scars indicative of platform preparation. A flake does not need to be complete to be included in this class.

Pressure Bifacial Thinning Flake. These flakes tend to be small (SG-4), but can also be larger. Flakes of this type must retain a platform, which is multifaceted and usually exhibits evidence of grinding. They are produced during the last stages of biface manufacture.

Linear Flake. A linear flake has a parallel-sided form and a length:width ratio similar to that of blades (2.0 or greater), but they lack evidence of repetitive manufacture of flakes from a prepared, specialized core.

Count and Weight

The number of flakes in each of the sub-groups was recorded, as was the weight, recorded to the nearest 0.1 gram. Count and weight were recorded for all size grades.

ANALYSIS OF CHIPPED STONE TOOLS

In this system, the analyst classifies each tool according to its place in each of several domains of human behavior (Ahler et al. 1994:26-118). These domains include *technology*, the reduction sequence used by the flintknapper to produce the tool; *function*, how people used or intended to use the tool; *systemic context*, which is the tool's stage of use and/or manufacture at the time it was discarded; *raw material*, the type of stone used to make the tool; and *style*, defined here as the morphology of the tool, dependent on the cultural context of the tool maker. For this analysis, only those attributes which seemed likely to contribute to a better understanding of tool manufacture and use behaviors were selected for use. A complete list of the attributes used and their codes is provided in

Appendix I and the resulting data are provided in Appendix J. The attributes are briefly discussed below.

FS Number

This is a unique number assigned to each artifact. This variable was coded for all stone tools, both chipped stone and non-chipped stone tools.

Class

This is the general category to which each tool was assigned. It is based on overall morphology and perceived function. These classes include tested raw material, cores, patterned bifaces, flake and tabular tools, and non-chipped tools. The non-chipped tools were analyzed under a different methodology, described below.

Completeness

Each tool was described according to its level of completeness. This variable also includes descriptions of fragments, such as distal end, proximal end, medial fragment, indeterminate end, and margin fragment.

Technological Class

This variable describes both the technological method used to produce the artifact and the initial form of the raw material piece. The different classes distinguish between different tool production sequences. Patterned tools "are those in which the original shape of the piece of raw material is rather completely modified, altered, or obscured during the manufacturing process" and unpatterned tools are those "in which the final form of the tool is little changed from the form of the input piece of raw material" (Ahler et al. 1994:48). The technological class of unfinished or incomplete tools is based on the intended final product.

Morphological Class

This class is based on the basic shape of the artifact, as well as the degree of patterning. The classes describe the shapes of highly stylized tools such as projectile points, as well as the general shapes of less stylized tools, such as flake tools. They also divide retouch flakes from those that have been modified through use. Cores and tested raw materials (TRM) are also classified.

Use Wear and Intensity

Only a basic description of the type of use wear was coded since the means and expertise to conduct more functional use wear analysis is lacking. The use wear was examined with the naked eye or with a 10x handlens. Attributes include rounding, step fractures, scalar flake scars, crushing/battering, attrition, a combination of use wear attributes, unknown/other, and none. The level of use wear intensity was coded as heavy, moderate, or light.

Use Phase

An artifact's stage of manufacture and/or use at the time of discard is identified by use-phase class. These classes correspond, in part, to Schiffer's (1972) five processes in which an artifact participates during its life or systemic context: procurement, manufacture, use, maintenance and discard. The use phase classes used here combine a tool's stage in the manufacturing process with its usability to more closely describe the position of the artifact at its entry into the archaeological context. These classes are: unfinished and usable; unfinished and unusable; finished and usable; and finished and unusable.

Reason for Rejection/Utility

This variable details the primary reason for the abandonment of a tool or core at the site. It documents technological and sometimes post-depositional occurrences. Used in combination with the attributes of the use phase classification, this variable can provide information about tool rejection and discard behavior. This takes into account such things as flintknapping error and flaking/lithic reduction failure.

Lithic Material Type

The lithic material of each tool was recorded, using the same material types as was used for the chipped stone flaking debris analysis (see above).

Cortex

As with the debitage, the presence or absence of cortex was coded for each tool.

Blank

This variable documents the form of the raw material from which the tool or core was begun. Cobbles, blocks, tabular pieces, flakes and even other tools can be used to make tools. This variable tracks raw material selection as well as the recycling of existing tools.

Resharpening or Reworking

Resharpening is the rejuvenation of a dulled working edge and reworking is the remodification of a tool, often following fracture. The types include resharpened; reworked following fracture; chipped to a new form; reworked fracture and resharpened work element; and scavenged and reworked.

Multiple Functions

This variable records the presence of multiple functions on a single artifact. This can mean either multiple periods of use or multiple types of use. If an artifact has more than one function, each function is recorded separately as different tools. If a tool has two separate working elements, used for the same purpose, they are not recorded separately unless they occurred at different points in time.

Metrics

Metrics include length, width, thickness, and weight. Linear measurements were recorded to the nearest centimeter (cm) and weight measurements were recorded to the nearest tenth of a gram (g). The maximum length of the artifact was measured on all artifacts, whole and fragmentary. The maximum width of the artifact of the artifact was measured perpendicular to the axis measured for length. This measurement was made on all artifacts, whole and fragmentary. Maximum thickness was also measured on all whole and fragmentary artifacts. Finally, the weight of each tool was recorded, to the nearest tenth of a gram.

Edge Angle

The lateral edge angle of each chipped stone tool was recorded to the nearest degree, using a goniometer. The measurement was taken at a location representative of the major portion of the tool edge. This measurement records the angle of the edge only, and not the angle of faces of the tool. Edge angle is indicative of use, i.e., tools with edge angles of 50° or less are considered cutting tools, and tools with edge angles greater than 50° are considered scraping tools. Cores and TRM were not included in this category.

Biface Stage

All bifaces were coded according to their position in the production sequence. The stages are used to describe the progression from raw material to completed tool. In this analysis, six stages are used:

Stage 1 - initial blank

Stage 2 - edging

Stage 3 - initial thinning

Stage 4 - secondary thinning

Stage 5 - final thinning and shaping

Stage 6 - finished, hafted biface

"Unhafted bifaces" include stages 1-5, and "hafted bifaces" include only stage 6. The unhafted biface analysis includes tools that may have been hafted bifaces, but because the base or haft modification is missing, it is not possible to conclude that the artifact was in fact hafted. Some artifacts, especially projectile point tips and hafted knife tips, end up classified as unhafted bifaces simply because the base is missing. Hafted bifaces will mostly be temporally and/or culturally diagnostic projectile points, drills and knives.

Flake Tool Certainty

Flake tool certainty codes serve to record the degree of uncertainty in the identification of retouched and use-modified flakes or tabular tools. Seemingly apparent use modification can result from trampling, shoveling, bag wear and other post-depositional processes.

Core Technomorphological Class

This variable was coded only for cores and TRM. It records technological and morphological features that can be used to separate cores from TRM and specific core types such as bipolar from freehand types such as blade cores and tabular cores.

Core Function

Core function records the type and shape of flakes produced from a particular core. All TRM are categorized as "indeterminate" based on the termination of the flaking process.

Core Technology

Core technology reflects the type of percussion (Hertzian, bending, wedging) used to strike flakes from the core. This variable also separates bipolar from non-bipolar flake production. All TRM are categorized as "indeterminate" based on the termination of the flaking process.

Core Platform Preparation

This variable describes the striking platform on a freehand, or non-bipolar core. The presence of cortex or signs of preparation, such as trimming, blunting, or grinding, are recorded.

Number of Core Platforms

The number of observable platforms, or those that might be inferred, was recorded for each freehand core.

Core Production Stage

Core production stage describes the degree to which the core or TRM has been utilized. This is recorded for both bipolar and non-bipolar cores.

NON-CHIPPED AND GROUND STONE TOOLS

Methods of analysis for all non-chipped stone artifacts, including milling implements, hammer stones, and manuports were adapted from MAC's artifact analysis manual, which was originally developed for the UBL project (MAC 1993). The intent of the analysis is to gain an idea of how these tools were manufactured, modified and used. Where applicable, the manufacturing technique and intensity were documented. In the case of milling implements, all facets, or used sides were analyzed, and the intensity of use for each facet was noted.

Material Types

Material types were recorded for all non-chipped and ground stone tools. These types are limited to sandstone and quartzite. The majority of tools in this category are made from sandstone.

Metrics

All artifacts were weighed, with more detailed measurements, including length, width and thickness recorded only on complete or nearly complete artifacts. Linear measurements were taken to the nearest centimeter, and weights were recorded to the nearest tenth of a gram when possible, or nearest gram for larger implements which were outside of the mechanical range of the higher resolution scale.

Manufacturing Process and Intensity

The manufacturing process refers to the technique that was employed in the shaping of the tool and not modifications resulting from use. Most commonly, the edges were modified to shape the tool, such as flaking around the edges of a slab for a metate. Pecking was often utilized on milling implements to create a more effective use surface. The manufacturing intensity was also recorded, indicating level of effort in the formation of the tool. Five variables for intensity were recognized and coded. These variables code for the amount of the surface that could be reliably recognized as having been modified. If an artifact was too fragmentary, the level of intensity of manufacture could not be reliably recognized and was thus coded as "unknown". The codes are:

0 = No modification
1 = 1-25% modification
2 = 26-50% modification
3 = 51-75% modification
4 = 76-100% modification
9 = Unknown modification

Use Wear and Intensity

Five variables were used to analyze discrete use surfaces: grinding, polishing, striations, pecking and battering. While pecking was typically utilized as a manufacturing process in the formation of the tool, it was also utilized to rejuvenate milling implements when the use surface had become too smooth to allow for efficient grinding. In these cases, pecking was considered a result of the use of the artifact rather than part of the modification process. Battering was limited to hammer stones, although it was not unusual for manos to be reused as hammer stones.

Direction of wear was determined only when striations were present. Attributes include parallel, perpendicular, diagonal left, diagonal right, and unknown. Parallel and perpendicular were determined by the direction of use at close to 90° to the long axis of the artifact.

Wear intensity can be subjective depending on the analyst, therefore, only two types were recognized: light and heavy. Light use wear was defined as wear that had not altered the shape of the use surface. Heavy wear was defined as use that has altered the shape of the use surface such that it no longer reflects the original shape of the artifact prior to use.

Descriptive Classes

The artifacts were placed into descriptive classes, which also serve as functional classes. These include mano, metate, hammer stone, unknown and other. Fragments of ground stone that were too small to identify beyond a milling implement were placed into the "unknown" category. Manos are hand-sized cobbles utilized as the grinding implement on a grinding slab, the metate.

Manuports were placed in the "other" category. These artifacts were typically unmodified stones that were notable because they were anomalous or unique in the site setting. No manufacturing or use modifications were noted, and these artifacts were typically described by material type and basic measurements only.

Thermal Alteration and Reuse

Thermal alteration and reuse were noted. Numerous manos had been reused as hammer stones, which was the most common reuse of the manos. Thermal alteration attributes included cracking, rough, angular edges interior to the stone, and sometimes either reddened or blackened modification of the material.

Use Phase and Reason for Rejection/Utility

Modifications to the UBL manual include the addition of a use-phase class and reason for rejection/utility; both of these additions were based on Graham (2004). The use-phase class identifies the artifact's stage of manufacture and/or use at the time of discard, to describe the condition of the artifact when it was abandoned or lost. The rejection/utility variable describes the primary reason for the tool's abandonment at the site. In combination with the use-phase classification, this variable can provide information about tool rejection and discard behavior, such as inferior material or size/exhaustion of the tool.

FAUNAL ANALYSIS

The analysis of the faunal assemblage from 5MF6255 was performed by Jennifer Borresen Lee. The methodologies that were utilized are included in the summary report for this site, included in this document as Appendix H. The following is a short summary of the methods. For more detail, the reader is referred to the faunal report.

Species were identified using comparative collections, listed in Appendix H. Taxonomic identifications of the various mammal remains followed Burt and Grossenheider (1980). All species with modern and historic distributions in northwestern Colorado, northeastern Utah, and southwestern Wyoming were considered. Several characteristics for each identifiable specimen were recorded, of which the data was entered into a relational database (Microsoft Access 2007). All fragments were size graded, counted, and weighed. The size grade methods utilized are the same as that for lithic debitage, using the same type of nested sieves. Additional analysis was restricted to all SG-3 and larger specimens, and any SG-4 or smaller bones identifiable to genus/species or skeletal element.

Identifications of individual specimens were made to the highest possible taxonomic category, such as Class, Order, and genus and/or species level. If specimens could not be identified to genus, arbitrary size groupings were used (e.g., Brain 1981; Thomas 1969). Examples of such groupings include mammal body size classes (BSC) I, II, III, and IV. Sorting into such groups can provide useful information not apparent when fragments unidentifiable beyond genus/species are disregarded.

Taxonomic diversity is presented as a whole and separate tabulations are provided for the different activity areas within the site. Two basic quantitative methods were utilized to obtain a clearer understanding of the archaeofauna. These are number of individual specimen (NISP), or the total count of identified specimens, or fragments, per species or group as well as per element (Lyman 1994:100); and MNI, or the minimum number of animals necessary to account for all identified specimens and calculated based on the most frequently occurring element or element part.

When analyzing modifications of the bone, taphonomy is also considered. Taphonomy includes both cultural and non-cultural processes that affect the bone, such as scavenger gnawing, root etching, and weather-related events, as well as human-induced burning and butchering. These processes can affect the taxonomic diversity, element survivorship, and surface modifications of a site's faunal remains. Consequently, all specimens were macroscopically examined for surface modifications, with the criteria for distinguishing culturally-affiliated bone from natural bone generally following Lubinski (2000:Table 3.3). Specimens yielding evidence of butchering or gnaw marks were studied more closely with a 10x hand lens.

A number of lagomorph and rodent species were identified at 5MF6255, including several fossorial and semi-fossorial mammals, such as rabbit, pocket gopher, ground squirrel, chipmunk, prairie dog, and voles. With the exception of the rabbits, the remaining species are generally considered intrusive to archaeological sites rather than as a result of cultural activity. Their activity can have enormous effects on the archaeological record in terms of artifact redistribution and destruction (e.g., Bocek 1986; Erlandson 1984; Johnson 1989; Wood and Johnson 1978). Ethnographic and ethnohistoric records, however, suggest rodents were often utilized as a food resource by prehistoric humans (see Shaffer 1992). As a result, closer attention is now paid to their remains in faunal assemblages, with some useful patterns recognized for determining if they are present due to cultural or non-cultural activity (e.g., Driver 1985; Falk and Semken 1990; Shaffer 1992; Szuter 1991). With these studies in mind, unless rabbit and rodent remains are present in high numbers and/or exhibit obvious proof of human modification (e.g., burning, butchery, breakage), they are generally assumed to be intrusive.

The main goals of the analysis of the faunal remains were aimed at answering questions related to subsistence, seasonality, settlement patterns, intra-site spatial variability, and site function (Metcalf 2005:Table 4). The identification and quantification of animal species (taxonomic diversity) in each archaeofauna was done in an effort to understand patterns in subsistence behaviors and/or dietary preferences. When used in conjunction with other aspects of a particular site, such data can be useful for determining length of site occupation and, to some degree, number of site occupants. Seasonality assessments based on faunal material were attempted whenever possible. Typically, fetal remains, if present, are an indicator of seasonality, based on the discrete gestation and birthing periods of ungulate species. If fetal remains are present, occupation of the site occurred sometime during the gestation period. No fetal remains, however, were recovered from the archaeofauna at site 5MF6255. The same is true of tooth morphology and eruption, however, only rodent teeth were recovered.

In the next chapter, I will describe the geomorphological and cultural stratigraphy noted at the site. In addition, I will cover the chronology as determined by radiometric analysis of charcoal samples as well as the relative chronology noted by the diagnostic hafted bifaces.

CHAPTER 5: STRATIGRAPHY AND CHRONOLOGY

INTRODUCTION

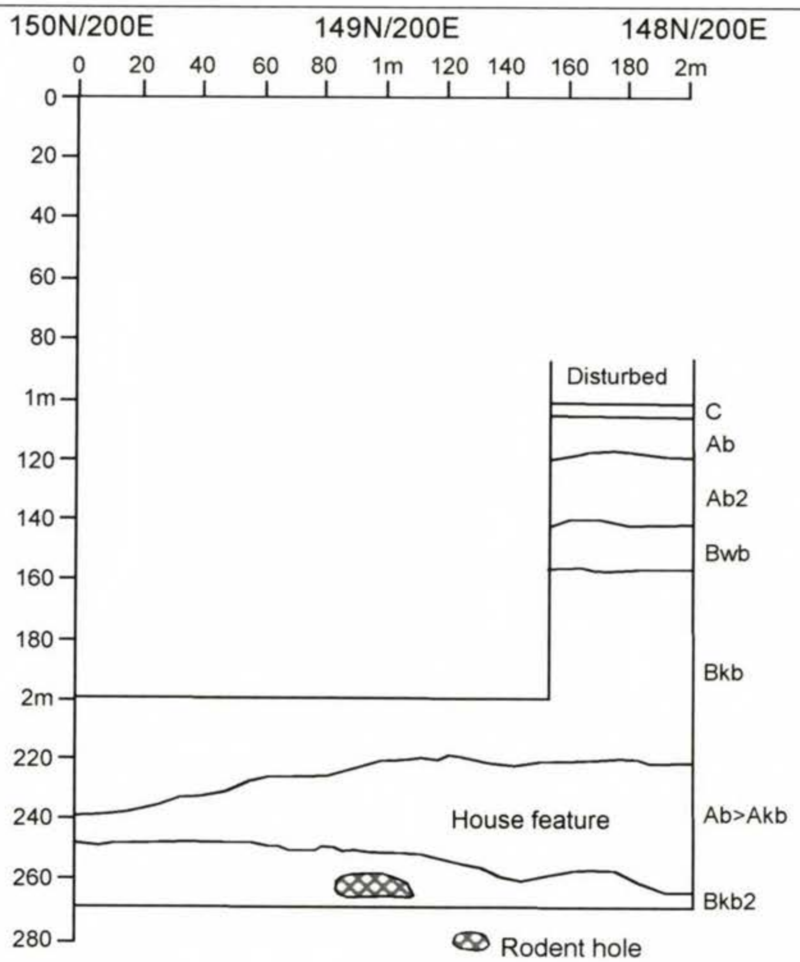
This chapter will discuss the natural stratigraphy at the site as identified by geomorphologist Michael McFaul, as well as the cultural stratigraphy identified by the author. The following sections describe the chronology of the site based on the results of AMS ^{14}C dating of charcoal samples from a floor feature within each house, as well as the diagnostic projectile points discovered. Diagnostic projectile points can be used as a separate line of evidence for the dating of cultural occupations, serving as an independent check on radiometric dates that may be affected by "old wood" issues (Reed and Metcalf 1999). In the case of 5MF6255, the radiometric dates help to establish the morphologies of these points as present in the early Archaic era as the charcoal chosen for dating was sagebrush. Sagebrush is a short-lived species, typically living approximately 50 to 70 years (Perryman et al. 2001), although there are some issues with the length of time sagebrush is present in the environment, approximately 200 years in the Southwest, creating an uncertainty in the dates that may offset cultural activity (Geib 2001).

NATURAL STRATIGRAPHY

Site 5MF6255 is located on a T3 alluvial terrace on the north side of the Yampa River. The T3 terrace is the oldest river terrace in this section of the Yampa River valley, which was occupied by the river through 6690 BP (uncalibrated), after which it began a period of downcutting (McFaul 2009:4). The T3 is the third terrace above the river. The site lies near the foot of a slope in an early aeolian sediment unit, which caps the terrace.

Understanding the geomorphology, or the processes by which the landscape was shaped, helps to understand how the site formed and how good its integrity is. The reason for doing a geomorphological investigation in conjunction with archaeological excavation is to determine the contextual integrity of a site. Good contextual integrity allows archaeologists to identify activity areas that reflect the behavior that potentially created the distribution patterns (Binford 1980). A second reason for such investigations is to gain some understanding of past climatic events that may have led to formation of landscape features reflected in the stratigraphic profiles, such as buried surfaces. These were the stated goals of the geomorphological investigations conducted by Michael McFaul (2009).

The following is a summary of the geomorphological report by McFaul (2009), presented in Appendix A. McFaul identified three aeolian units (Eolian I, II, and III) which are comprised of seven soil horizons, summarized in the profile in Figure 5. Eolian I was the deepest and oldest unit and consisted of the lowest paleosol (Ab>Akb) and the lowest sandy loam horizon (Bkb2), which underlies the Ab>Akb horizon. Eolian II consisted of two sand horizons (Bwb, Bkb), with two paleosol horizons (Ab, Ab2) overlying the sand horizons. The highest and youngest aeolian unit (Eolian III) is composed of a C horizon, which is a brown loamy sand. Excavation at the site was through the lower three stratigraphic horizons identified by McFaul, the Bkb, Ab>Akb, and Bkb2 horizons, which form the lowest horizon of Eolian II and the upper portion of Eolian I. The B horizons formed during xeric, or hot and dry, environmental conditions,



Depth cm	Sediment Unit	Horizon	Characteristics
100-106	Eolian III	C	Brown (10YR5/3); loamy sand, coarse-grained, moderately-sorted; massive; consistence = 1.5 gr/cm2
106-119		Ab	Brown (10YR4/3); sandy clay, medium-grained, well-sorted; massive; consistence = 2.0 gr/cm2
119-142		Ab2	Dark brown (10YR3/3); sandy clay loam, medium-grained, well-sorted; massive; consistence = 3.0 gr/cm2
142-156	Eolian II	Bwb	Brown (10YR5/3);sandy loam, medium-grained, well-sorted; massive; consistence = 2.0 gr/cm2
156-220		Bkb	Light brownish gray (10YR6/2) grading to light gray (10YR7/3) with depth; loamy sand, coarse-grained, well-sorted, subrounded, quartz; massive; violently effervescent, many (40%), fine-medium, irregular, segregated filaments, Stage II; consistence = 4.0 gr/cm2
220-263	Eolian I	Ab>Akb	Dark gray (10YR4/1);sandy loam, coarse-grained, well-sorted; massive; violently effervescent, many (70%), fine, irregular, segregated filaments; almost plugged, Stage II; consistence = 1.75 gr/cm2; **radiocarbon age of feature 7190 +/-50 BP**
263-270	TD	Bkb2	Light gray (10YR7/2); sandy loam, coarse-grained, well-sorted; massive; violently effervescent, many (40%), fine, irregular, segregated filaments, Stage II; consistence = 2.- gr/cm2

Figure 5. Geomorphological profile of east wall 148E and 149E (adapted from McFaul 2009:7)

while the paleosols formed during more mesic conditions, which are more stable and moist, allowing for the formation of soils with a higher organic content. The lowest paleosol (Ab>Akb), in which the cultural level of 5MF6255 is located, underlies most of the xeric aeolian deposition. The oldest horizon, which composes the lowest portion of Eolian I, underlies the occupation of this site and dates older than approximately 7190 $\pm$ 50 BP. This radiocarbon date was obtained from a charcoal sample taken from near the top of the occupation layer along the trench. The next aeolian event (Eolian II), also occurring during a xeric period, occurred more than 4000-5000 years ago, based on the relative age-dating of soil carbonate development (McFaul 2009:6). The age of the third aeolian unit (Eolian III) is unknown, although it occurred sometime after 4000 years ago.

The east walls of the units were also profiled to capture the finer details noted during excavation, as well as to identify the profile of F17, the basin house originally observed in the trench (Figure 6). The following discussion is a description of these strata. Strata I, II, and III were McFaul's Bkb horizon. Stratum I was a compact yellow brown silty sand with a few sandstone gravels present. Thin lenses of carbonates were present (Strata II and III), creating extremely hard caps at various levels. These strata were relatively sterile and not screened except when the few artifacts recovered were observed. Stratum III, which marked the transition from McFaul's Bkb to Ab>Akb horizons, was a very pale layer of carbonates that was difficult to excavate. Strata IV and VII were McFaul's Ab>Akb horizon. Stratum IV and the lower feature fill (Stratum VII) represented the cultural levels at this site. The majority of artifacts were recovered from these two strata and they represent the cultural deposits. Stratum IV was a medium gray brown silty sand that was very compact. No gravels larger than 1/4" diameter were

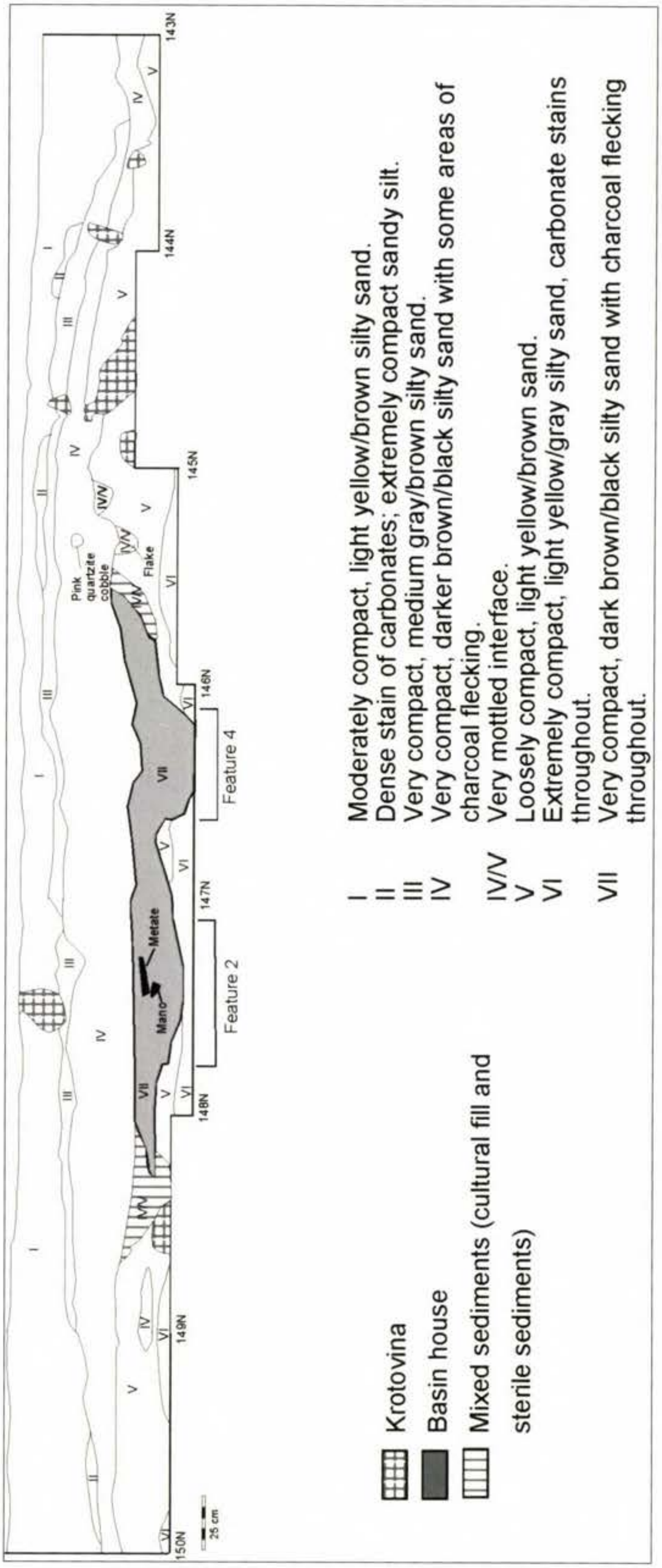


Figure 6. East wall at profile 200E

present in either Strata IV or VII. Calcium carbonate deposits had accumulated in diffuse aggregates and stringers rather than as layers. Stratum VII was also very compact with a high degree of diffuse carbonates. It was a darker black silty sand, also with no gravels present. Some areas of the site, particularly between the basin houses and above their floors, consisted of a mottled dark gray brown sand and yellow brown to brown sand (Stratum IV/V), making identification of the house floors difficult. Underlying the site were Strata V and VI, which correspond to McFaul's Bkb2 horizon. These strata were looser, coarse grained yellow to yellow brown sands. This was the earliest aeolian sediment unit identified at the site, with decaying sandstone rocks scattered throughout.

The results of these studies indicate that the site retains good integrity, meaning artifact distributions likely represent the activities that led to the discard of the artifacts. These studies have also shown that there was a period of lower moisture immediately prior to the occupation of the site. The main part of the occupation lies near the bottom of the paleosol, indicating the moister conditions that led to the formation of this buried soil were just beginning when the site was occupied.

CULTURAL STRATIGRAPHY

Strata IV and VII constituted the cultural level at this site, which comprised the single analytical unit. The depths of the cultural level varied across the site; it was thicker over the three houses and main occupation area, and thinned to the west. The top of the cultural level varied from a maximum of 190 cmbs to a minimum of 83 cmbs, and the bottom of the level varied from a maximum of 206 cmbs to a minimum of 104 cmbs. Generally, the thickness of the cultural level was about 45 cm, although it varied from a minimum of 10 cm to a maximum of 84 cm. The thickest portions lay over the basin houses.

DEFINITION OF ANALYTICAL UNIT AND ACTIVITY AREAS

As noted above, only one analytical unit (AU) was defined for the excavated portion of the site, encompassing the entirety of the cultural level. Within this AU, four activity areas (AA) and one non-floor distribution area (NFDA) were defined (Table 3). The activity areas were based on the final 10 cm of sediment above the base of excavation within the defined houses. Because of the undulating floors, some of the depths of the activity areas are greater than 10 cm. The non-floor distribution is a catch-all unit for all other excavated areas at the site.

Table 3. Provenience designations and associated features of the activity and distribution areas

Activity Area	Associated Features	Grid unit	Depth (cmbd)
House 15 Activity Area (H15AA)	10, 11, 14	146N 204E	150-177
		146N 205-206E	160-175
		146-147N 207E	140-151
		147N 203E	160-165
		147N 204-205E	160-175
		147N 206E	169-173
		148N 203E	154-158
	10, 11, 14	148N 204E	160-173
		148N 205E	161-174
		148N 206E	152-169
House 15 Anteroom Activity Area (H15AAA)	16	144-145N 204E	150-164
		144N 205E	160-177
		144N 206E	170-180
		145N 205E	170-180
		145N 206E	150-191
House 17 Activity Area (H17AA)	1, 2, 3, 4, 5, 6, 7	145N 199E	180-198
		145N 200E	160-193
		146-147N 198E	180-200
		146N 199E	190-210
		146-147N 200E	180-196
		146N 201E	160-172
		147N 199E	190-210
		147N 201E	160-162
		148N 198-199E	190-200
		148N 200E	180-192
House 18 Activity Area (H18AA)	8, 9, 12, 13	141N 202E	150-158
		141N 203-204E	150-163
		141N 205E	140-168
		142N 202E	150-178
		142N 203E	160-192
		142N 204E	150-178
		142N 205E	140-155
		143N 202E	170-190
		143N 203E	170-183
		143N 204E	160-179

Activity Area	Associated Features	Grid unit	Depth (cmbd)
House 18 Activity Area (H18AA)	8, 9, 12, 13	143N 205E	150-159
Non-Floor Distributions (NFDA)	None	140N 202-204E	100-104
		141N 201-206E	89-150
		152N 201-206E	110-160
		143N 195-199E	132-222
		143N 200-206E	110-184
		144N 195-198E	141-216
		144N 199-207E	97-180
		145N 195-199E	138-199
		145N 200-207E	87-170
		146N 195-199E	140-202
		146N 200-207E	82-180
		147N 195-199E	140-202
		147N 200-207E	82-180
		148N 195-200E	140-205
		148N 201-206E	90-170
		149N 195-199E	140-200
		149N 200-206E	100-180

CHRONOLOGY

Radiocarbon Dates

Five AMS ^{14}C dates derived from charcoal were recovered from hearths within the basin houses and the general cultural level (Table 4). Three of the samples submitted were sagebrush (*Artemisia* sp.), a relatively short-lived species, and the other two samples were unidentified charcoal wood. Two samples were submitted to Beta Analytic and the rest were submitted to INSTAAR. F4 was located within house F17, F13 was located within house F15, F10 was located within house F18, and F16 was located within the anteroom of house F15. The dates generally fall into a 280-year range between approximately 7840-8120 cal BP, bracketing the occupation of this site into a relatively tight time frame. This range, however, represents the extreme dates returned.

Table 4. Radiocarbon dates for 5MF6255

Feature No./Sample No.	Sample Description	^{14}C Age B.P.	$\partial^{13}C$	Calibrated Age Ranges (2-Sigma) with .05 or Greater Relative Area Under Probability Distribution	Relative Probabilities for Age Ranges	Mean of Calibrated Age Ranges (cal BP)	Lab No.
F10/S92	Charcoal, prob. sage brush (cf. *Artemisia* sp.)[a]	7020 ± 25	-25.2%	7794-7883	0.59	**7839**	CURL-10310
				7886-7933	0.41	**7910**	
S10	Charred wood	7190 ± 50	-23.9%	7935-8072	0.84	**8004**	Beta-220514
				8084-8159	0.16	**8122**	
F4/S84	Charcoal, prob. sage brush (cf. *Artemisia* sp.)[a]	7225 ± 25	-24.6%	7970-8064	0.80	**8017**	CURL-10321
				8087-8156	0.20	**8122**	
F13/S42	Charcoal, prob. sage brush (cf. *Artemisia* sp.)[a]	7285 ± 30	-25.6%	8022-8170	1.00	**8096**	CURL-10327
F16/S	Charcoal wood	7130 ± 50	-23.9%	7848-8026	1.00	**7937**	Beta-266648

Notes: All dates are AMS unless otherwise noted; All calibrations were done using CALIB 5.0.2 with IIntCal04 calibration curve and are presented as years before present (1950) (http://radiocarbon.pa.qub.ac.uk/calib/calib.html).
[a]Macrobotanical analyst, Abbie Bollans, Alpine Archaeological Consultants, Inc.

Diagnostic Hafted Bifaces

Three hafted bifaces were recovered from 5MF6255; two are diagnostic and one is minimally diagnostic. General discussion and attribute observations of all flaked stone tools are presented in the material culture chapter below. This particular section discusses the diagnostic attributes of the three hafted bifaces recovered.

All three hafted bifaces are corner-notched (Figure 7). One (Cat. No. 48) is a complete specimen recovered from one level above the base of excavation in the furthest north unit immediately adjacent to and west of the trench, placing it just north of F17, the basin house originally identified at this site. Cat. No. 434 is a base with part of the blade intact and was recovered from two levels above the base of excavation on the southwest

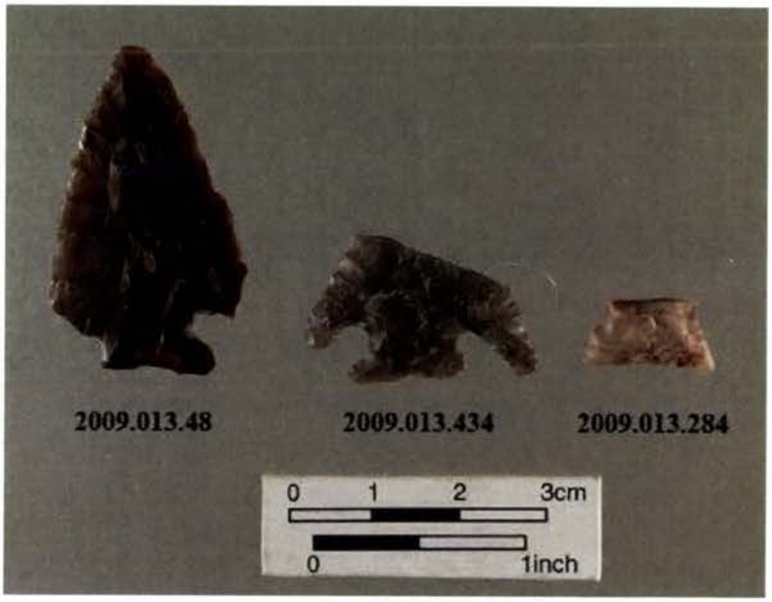


Figure 7. Diagnostic hafted bifaces

side of F17. Cat. No. 284 is a minimally diagnostic hafting element from the top of the cultural sediments near the center of the excavation block.

The complete point (Cat. No. 48) is a medium-sized, corner-notched point that is generally equivalent to the Elko corner-notched series (Drager and Ireland 1986; Holmer 1986). Elko points are common throughout the Archaic period. More regionally, Cat. No. 48 most closely resembles a point recovered during the 1992 excavation of 48SW8842 and dated to 7190 ± 100 BP (Pool 2001:14-16). Points recovered from sites closer to the Spring Creek/Yampa River area were dated to 4000 to 2500 BP, within the Settled period of the Archaic era (Kalasz 2000:14-17; O'Brien and McDonald 2000a:7-10).

The second diagnostic projectile point (Cat. No. 434) has an expanding base and deep oblique corner notches. Most of the blade is missing. The point resembles a type recovered from several Spring Creek sites (5MF2996, 5MF2998, 5MF3048, 5MF3610), but it is not confidently associated with this designation. These points are thicker than Cat. No. 434. This may be no more than a variation of the category, or it could indicate an entirely different type. This type is similar to Cat. No. 48 discussed above, and dates to the same period within the region, which is the Settled period of the Archaic era (Kalasz 2000:14-17; McDonald 1999:5-9; McDonald 2000:4; O'Brien and McDonald 2000a:7-10; Pool 2001:14-16).

Cat. No. 284 consists of an expanding base, likely corner notched. The blade and tangs are absent. The point appears to most closely resemble an equivalent to the Elko corner-notched from the Great Basin (Drager and Ireland 1986; Holmer 1986), or the Pelican Lake type from the Northern Great Plains (Drager and Ireland 1986; Frison 1991:103). Pelican Lake points tend to be later in the Archaic than most Elko points and are typically confined to the Plains. Sites from the Spring Creek/Yampa River area that yielded points similar to this type date from 4530 ± 80 BP to 1400 ± 70 BP (Kalasz et al. 2000:17-20; Pool 2000:7-9; Pool 2002:12-13; Rood and McDonald 2000:8-10).

SUMMARY

The geomorphological studies conducted at the site resulted in the identification of three aeolian units, representative of unstable surfaces and dry conditions, leading to erosion and deposition. With the exception of the last and youngest aeolian unit, each of the older two aeolian units were capped by a well-developed soil horizon. These soil horizons represent stable surfaces and moister environmental conditions. The occupation of site 5MF6255 lies within the first and oldest of these soil horizons, or paleosols, suggesting the climatic conditions of the region at the beginning of the occupation of the site were mesic, allowing for the formation of the paleosol. Additionally, the aeolian nature of the sediments indicates the contextual integrity of the site is good, allowing for better interpretation of artifact distributions, activity areas, and ultimately, the potential behaviors that led to the deposition of the cultural stratum.

Radiocarbon dates derived from charcoal recovered from the cultural level indicate the site was occupied over a period of approximately 300-400 years during the Pioneer period of the Archaic Era, specifically between 7794-8170 cal BP. The diagnostic artifacts also fall within this period. They are similar to the Elko series, which is diagnostic only to the general Archaic Era. Comparisons to types within the immediate Spring Creek/Deception Creek region indicate points of similar style are present on sites that date more than 4000 years later. The type represented by Cat. No. 48, the complete hafted biface, was also present in south-central Wyoming 7190 radiocarbon years ago, indicating this morphology was present in this region for approximately 3000 years.

In Chapter 6, I will present the results of excavation, including descriptions of the lithic assemblage, stone tool assemblages including both chipped stone and non-chipped stone, and the features. This chapter is mostly descriptive, with little interpretation included. The interpretations are mostly limited to what information the artifact assemblage as a whole is able to provide about the possible activities that took place here.

CHAPTER 6: CULTURAL MATERIALS AND FEATURES

INTRODUCTION

Excavations at site 5MF6255 were performed only on the larger, lower feature and resulted in the recovery of 777 pieces of lithic debitage, 37 chipped stone tools, 76 non-chipped stone tools, one piece of burned clay, 290 pieces of FCR weighing a total of 10,001.7 g, and 8,618 fragments of bone weighing a total of 655.9 g. The chipped stone tools include two diagnostic hafted bifaces, one minimally diagnostic hafted biface, five unhafted bifaces, 26 flake tools, and three cores/tested raw material (TRM) (Table 5). The non-chipped stone tool assemblage includes 56 milling implements, one hammer stone, 11 minimally modified stones, and eight unmodified cobbles. Eighteen features were also discovered and included three basin houses, 12 basin-shaped hearths, and three possible postmolds.

Table 5. Distribution of tool type by material

Activity Area	Raw material	Unhafted biface	Hafted biface	Flake tool	Core	TRM	TOTAL
H15AA	Chert	1	--	--	--	--	**1**
H15AAA	Chert	--	--	--	--	--	**0**
H17AA	Chert	--	--	1	--	--	**1**
H18AA	Chert	1	--	4	--	--	**5**
NFDA	Chert	3	3	21	1	--	**28**
	Quartzite	--	--	--	--	2	**2**
TOTAL		**5**	**3**	**26**	**1**	**2**	**37**

Only one analytical unit was defined for the excavated portion of the site, the results of which are presented below. The cultural level was then divided into activity areas (AA) and the non-floor distribution area. These areas are discussed in the following Chapter 9. The artifact catalog can be found in Appendix J.

FLAKED STONE TOOLS

Hafted Bifaces

Three hafted bifaces were recovered including one minimally diagnostic projectile point base (Cat. No. 284), the diagnostic base and tangs of another (Cat. No. 434), and a nearly complete point (Cat. No. 48) (Table 6, see **Error! Reference source not found.**). All are stage 6, which are finished bifaces with the hafting element added (Table 7). No use wear was observed on the two points with partially intact to intact blade edges, indicating either light use, or possibly retouch just prior to loss.

Table 6. Measurements for hafted bifaces

Activity Area	Cat. No. 2009.013.	Max. Length (cm)	Max. Width (cm)	Max. Thick (cm)	Haft Width (cm)	Base Width (cm)	Weight (g)	Edge Angle (°)
NFDA	48	3.8	2.4	0.4	1.1	1.3*	3.4	14
NFDA	284	0.8*	1.5*	0.3*	1.0	1.5	0.4	15
NFDA	434	1.7*	2.8	0.3	1.0	1.4	1.5	17

* incomplete measurement

Table 7. Distribution of biface stages

Activity Area	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	TOTAL
H15AA	--	--	1	--	--	--	1
H15AAA	--	--	--	--	--	--	0
H17AA	--	--	--	--	--	--	0
H18AA	--	--	1	--	--	--	1
NFDA	--	1	2	--	--	3	6
TOTAL	**0**	**1**	**4**	**0**	**0**	**3**	**8**

Cat. No. 284 is an expanding stem with a straight base. It is made from Morgan/Madison chert and is too fragmentary to fit in a type, although Elko is a possibility. Cat. No. 48 is a nearly complete dark brown Bridger chert point with deep corner notches that was abandoned due to a lateral break. The lateral break could have been the result of the artifact being stepped on, or perhaps it was snapped in half. It fits into the Elko Corner-notched series. Cat. No. 434 is the proximal end of a deeply corner notched projectile point. It is dark brown chert and fits in the Elko Corner-notched type, which dates to the Archaic (Drager and Ireland 1986; Holmer 1986).

Unhafted Bifaces

Five unhafted bifaces were recovered (Table 8, Figure 8). One biface (Cat. No. 316) is stage 2 and four are stage 3 (see Table 7). Stage 2 bifaces are ones that have been edged, and stage 3 bifaces have been thinned. Two bifaces (Cat. No. 500, Cat. No. 860) are complete, two (Cat. No. 316, Cat. No. 510) are fragments, and one (Cat. No. 303) is a nearly complete artifact. Two of the bifaces are made of a gray chert, two are Morgan-Madison chert, and one is Bridger chert. Both Morgan-Madison bifaces exhibit evidence of thermal alteration, with one burned and the other heat treated. The Bridger chert biface is also burned. Only one biface (Cat. No. 860) exhibits light use wear; the remainder do not appear to have been utilized.

Table 8. Measurements for unhafted bifaces

Activity Area	Cat. No. 2009.013.	Stage	Max. Length (cm)	Max. Width (cm)	Max. Thick (cm)	Weight (g)	Edge Angle (°)
NFDA	303	3	6.0	2.6	0.6	9.3	20
NFDA	316	2	3.0*	4.1	1.1	18.0	40
NFDA	500	3	6.4	5.2	2.0	63.1	35
H18AA	510	3	5.6*	2.2*	0.8*	6.1	27
H15AA	860	3	8.9	6.5	2.8	148.5	36

*incomplete measurement

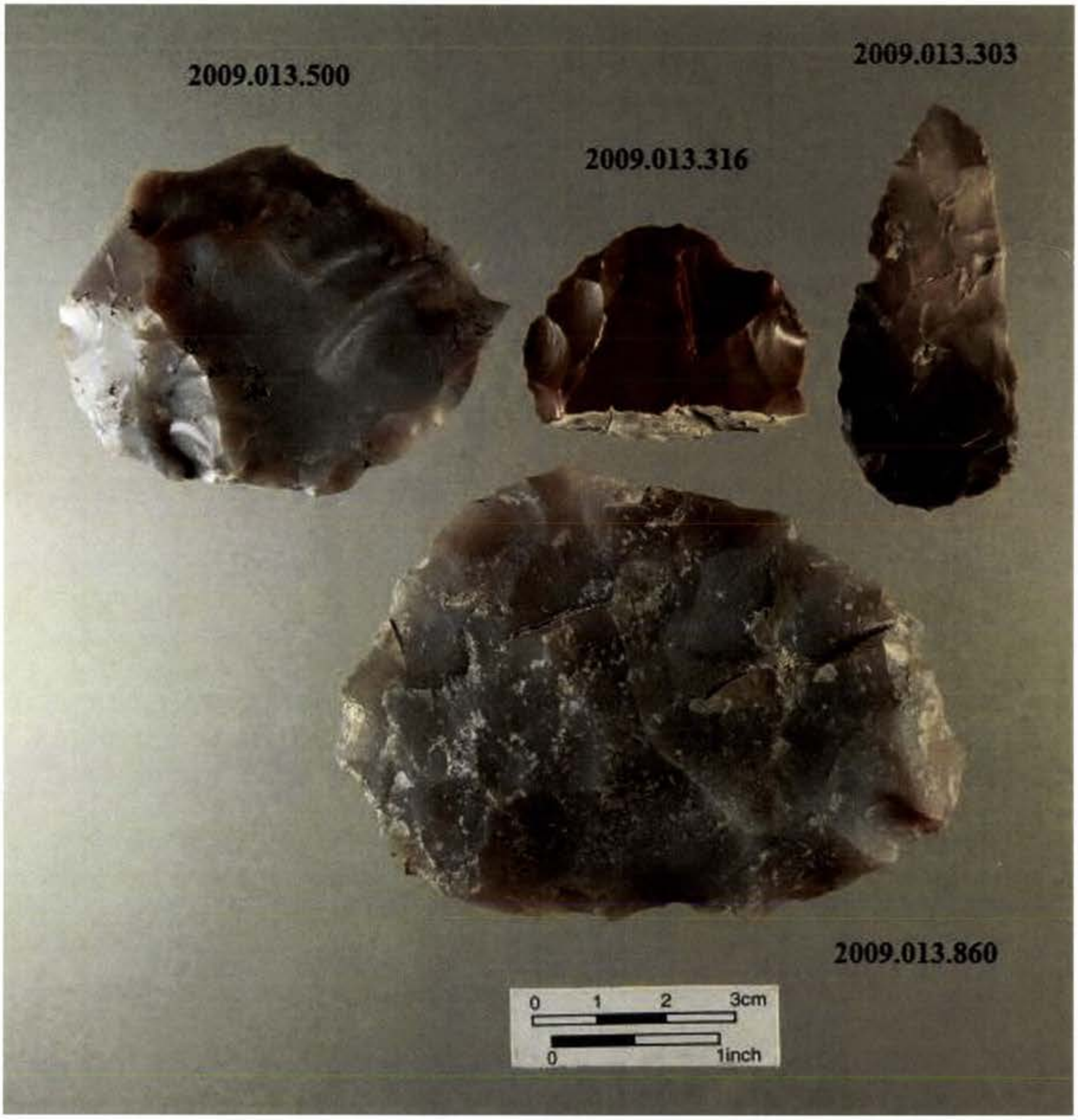


Figure 8. Bifaces

Flake Tools

Twenty-six flake tools were recovered from this site (Table 9, Figure 9). All of the flake tools were used for cutting, but five were also used as gravers (Table 10). One tool (Cat. No. 103) has a well-defined graver, and three tools (Cat. No. 372, 416, 663) have two gravers each. Two tools (Cat. No. 511, 578) were retouched after use. Eleven tools are Morgan/Madison chert, and fifteen are a dark brown algalitic chert.

Table 9. Flake tool characteristics

Cat. No. 2009.013.	Use wear intensity	No. of used edges	Edge angle (°)	Function
50	Light	1	13	Cutting
59	Light	1	35	Cutting
103*	Moderate	2	48	Graving
103*	Moderate	2	26	Cutting
126/291/534	na	2	31	Cutting
148	Heavy	2	31	Cutting
163	Light	2	22	Cutting
172	Heavy	1	18	Cutting
213	Heavy	1	22	Cutting
358	Moderate	2	23	Cutting
372*	Light	4	52	Graving
372*	Moderate	3	25	Cutting
391	Heavy	1	18	Cutting
395	Light	1	17	Cutting
416*	na	4	43	Graving
416*	Heavy	1	46	Cutting

Cat. No. 2009.013.	Use wear intensity	No. of used edges	Edge angle (°)	Function
429	Moderate	1	15	Cutting
449	Heavy	2	29	Cutting
470	Heavy	2	24	Cutting
471/511	Moderate	2	23	Cutting
530	Moderate	1	30	Cutting
538*	Moderate	1	40	Cutting
538*	Heavy	2	61	Graving
578	Moderate	2	49	Cutting
599/614	Heavy	2	39	Cutting
663*	Light	4	64	Graving
663*	Heavy	2	24	Cutting
701	Moderate	1	35	Cutting
856	Moderate	2	22	Cutting
881	Moderate	1	45	Cutting
882	Heavy	1	15	Cutting

*dual use

Table 10. Distribution of tool use types

Activity Area	Cutting	Graving	Total
H15AA	--	--	0
H15AAA	--	--	0
H17AA	1	--	1
H18AA	4	2	6
NFDA	21	3	24
TOTAL	**26**	**5**	**31**

Most tools exhibit medium or heavy use wear; only six tools exhibit light use wear. Thirteen tools have one utilized edge, twelve have two edges, and one tool has

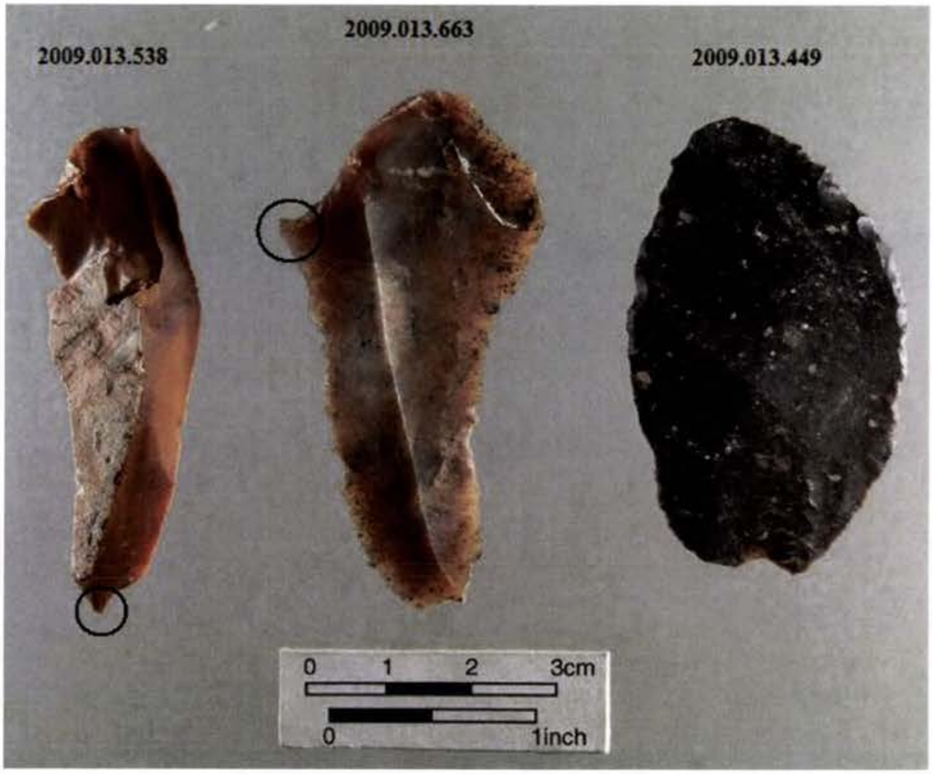


Figure 9. Representative sample of utilized flakes, gravers encircled

three edges, all of which were used for cutting. Two of the tools with gravers have two edges each associated with this function, and three graver tools have four utilized edges. Raw material was not abundant on the site or apparently in the immediate vicinity, thus, the occupants had to get a lot of use out of most tools. The gravers have a wide range of use wear, from non-existent to heavy. It is unlikely they were used for piercing hides, since no scraping tools were found and the points of the gravers are very delicate, more likely to break off with the pressure needed to pierce leather. If hides were processed on this site, they were most likely cleaned by using steeply edged tools. The delicate nature of these implements and lack of distinctive use wear suggest they were used for piercing or engraving soft materials.

Seven fragments constitute three complete tools and were recovered from different parts of the site. One cutting tool composed of three fragments (Cat. No. 126, 291, 534) has been retouched but does not exhibit use wear. One fragment (Cat. No. 291) was recovered from the floor of F18, while the other two pieces were recovered from higher levels (Figure 10). One moderately used cutting implement consists of two

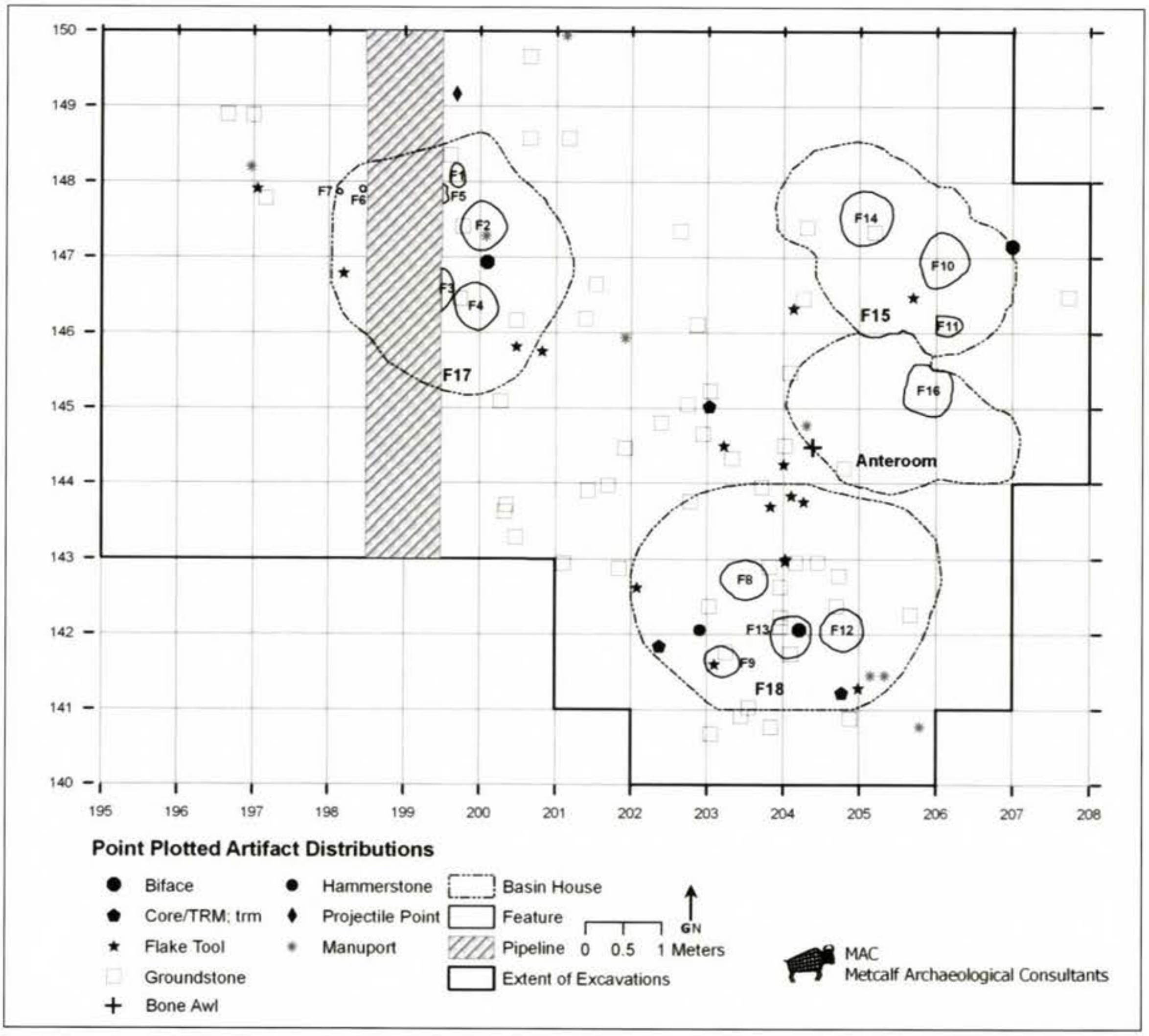


Figure 10. Locations of point plotted artifacts

fragments (Cat. No. 471, 511). The former was recovered from the fill of F18, while the latter was recovered from the floor of the same feature. Two other tool fragments (Cat.

No. 599, 614) refit to make a heavily utilized cutting tool. They were both located in the upper levels of the cultural level above and just to the north of F15.

Cores/Tested Raw Material

One core and two tested cobbles were also recovered from the site (Table 11). The core (Cat. No. 565) is grey chert, freehand and irregular with random pronounced-bulb flake production (Figure 11). The three platforms are unprepared and non-cortical. The tested cobbles (Cat. No. 398, Cat. No. 699) are quartzite, with fewer than three flake removals each.

Table 11. Measurements for cores and TRM

Activity Area	Cat. #	Tool Type	Max. Length (cm)	Max. Width (cm)	Max. Thick (cm)	Weight (g)
NFDA	565	Core	4.8	4.0	1.9	29.8
NFDA	398	TRM	10.1	8.1	3.2	235.0
NFDA	699	TRM	9.7	7.7	5.6	460.0

Figure 11. Core, Cat. No. 2009.013.565

Debitage

A total of 777 pieces of lithic debitage were recovered from this site; 774 flakes were recovered from the cultural level of the occupation and three were recovered from the sediments immediately overlying the cultural level. These three flakes will not be further discussed. The debitage from the cultural level weighs a total of 401.4 g (Table 12).

Table 12. Debitage by count, weight, and percentage across activity areas

Activity Area	n	%	Weight (g)	%
H15AA	29	3.7	14.0	3.5
H15AAA	40	5.2	8.8	2.2
H17AA	58	7.0	61.3	15.3
H18AA	165	21.3	27.5	6.9
NFDA	482	62.3	289.8	72.2
TOTAL	**774**	**100.0**	**401.4**	**100.0**

Size Grade

The debitage assemblage was sorted into four size grades, described in the Methods chapter of this thesis. The smaller size grades (SG-3, SG-4) dominate the assemblage and comprise more than 90% of the lithics. The smallest (SG-4) flakes are most abundant (Table 13). Small numbers of larger flakes (SG-1, SG-2) are also present.

Table 13. Debitage distribution by size grade and activity area

Activity Area	SG 1		SG 2		SG 3		SG 4		TOTAL	
	n	%	n	%	n	%	n	%	n	%
H15AA	--	--	3	5.4	9	3.4	17	3.8	**29**	**3.7**
% AA	--		*10.3*		*31.0*		*58.6*		*100.0*	
H15AAA	--	--	1	1.8	13	4.9	26	5.8	**40**	**5.2**
% AA	--		*2.5*		*32.5*		*65.0*		*100.0*	
H17AA	2	50.0	4	7.1	9	3.4	43	9.6	**58**	**7.5**
% AA	*3.4*		*6.9*		*15.5*		*74.1*		*100.0*	
H18AA	--	--	5	8.9	39	14.7	121	27.0	**165**	**21.3**
% AA	--		*3.0*		*23.6*		*73.3*		*100.0*	
NFDA	2	50.0	43	76.8	196	73.7	241	53.8	**482**	**62.3**
% AA	*0.4*		*8.9*		*40.7*		*50.0*		*100.0*	
TOTAL	**4**	**100.0**	**56**	**100.0**	**266**	**100.0**	**448**	**100.0**	**774**	**100.0**
% of total	***0.5***		***7.3***		***34.5***		***58.1***		***100.0***	

Material Type

A variety of raw material types were utilized (Table 14), with 84.7% of the assemblage comprised of cryptocrystalline materials (chert, chalcedony, petrified wood).

The next most common material type is quartzite (8.8%), although it comprises a small amount of the debitage. Morgan-Madison chert constitutes 41.6% of the cryptocrystalline materials recovered, while Bridger chert makes up 37.4%. These material types, which are most (79.0%) of the assemblage, are available in quarries located within 40 km of site 5MF6255, such as at Juniper Mountain to the south. Table 15 summarizes the distribution of flake size by material types. As would be expected considering its abundance in the debitage assemblage, cryptocrystalline materials are the only material types to include all size grades, with the quartz/quartzites including all but the largest size grade (SG-1).

Table 14. Distribution of material types

Activity Area	Basalt	Chalcedony	Chert	Obsidian	Petrified Wood	Quartz	Quartzite	Siltstone	TOTAL
H15AA	--	1	24	--	--	1	3	--	**29**
%	--	*3.4*	*82.8*	--	--	*3.4*	*10.3*	--	***100.0***
H15AAA	--	4	26	--	--	5	5	--	**40**
%	--	*10.0*	*65.0*	--	--	*12.5*	*12.5*	--	***100.0***
H17AA	--	5	45	--	--	3	5	--	**58**
%	--	*8.6*	*77.6*	--	--	*5.2*	*8.6*	--	***100.0***
H18AA	8	1	144	--	--	12	--	--	**165**
%	*4.8*	*0.6*	*87.3*	--	--	*7.3*	--	--	***100.0***
NFDA	2	22	381	1	1	18	55	2	**482**
%	*0.4*	*4.6*	*79.0*	*0.2*	*0.2*	*3.7*	*11.4*	*0.4*	***100.0***
TOTAL	**10**	**33**	**620**	**1**	**1**	**39**	**68**	**2**	**774**
% of total	***1.3***	***4.3***	***80.1***	***0.1***	***0.1***	***5.0***	***8.8***	***0.3***	***100.0***

Table 15. Distribution of debitage by size grade and material type

Raw Material	SG 1		SG 2		SG 3		SG 4		TOTAL	
	n	%	n	%	n	%	n	%	n	%
Activity Area H15AA										
Chalcedony/chert	--	--	3	*12.0*	8	*32.0*	14	*56.0*	**25**	***3.2***
Quartz/quartzite	--	--	--	--	1	*25.0*	3	*75.0*	**4**	***0.5***
Activity Area H15AAA										
Chalcedony/chert	--	--	1	*3.3*	11	*36.7*	18	*60.0*	**30**	***3.9***
Quartz/quartzite	--	--	--	--	2	*20.0*	8	*80.0*	**10**	***1.3***
Activity Area H17AA										
Chalcedony/chert	2	*4.0*	4	*8.0*	7	*14.0*	37	*74.0*	**50**	***6.5***
Quartz/quartzite	--	--	--	--	2	*25.0*	6	*75.0*	**8**	***1.0***
Activity Area H18AA										
Basalt	--	--	--	--	--	--	8	*100.0*	**8**	***1.0***
Chalcedony/chert	--	--	4	*2.8*	38	*26.2*	103	*71.0*	**145**	***18.7***
Quartz/quartzite	--	--	1	*8.3*	1	*8.3*	10	*83.3*	**12**	***1.6***
NFDA										
Basalt	--	--	--	--	2	*100.0*	--	--	**2**	***0.3***
Chalcedony/chert/ petrified wood	2	*0.5*	37	*9.2*	157	*38.9*	208	*51.5*	**404**	***52.2***
Obsidian	--	--	--	--	--	--	1	*100.0*	**1**	***0.1***
Quartz/quartzite	--	--	6	*8.2*	35	*47.9*	32	*43.8*	**73**	***9.4***
Siltstone	--	--	--	--	2	*100.0*	--	--	**2**	***0.3***
TOTAL	**4**	***0.5***	**56**	***7.2***	**266**	***34.4***	**448**	***57.9***	**774**	***100.0***

In addition, one obsidian flake was recovered and was submitted to the Geochemical Research Laboratory for X-ray fluorescent (XRF) sourcing analysis, and also to Origer's Obsidian Laboratory for obsidian hydration dating. The flake (Cat. No. 431) is a small (SG-4), untyped flake recovered from several levels above the southwestern margin of F15. Results of the XRF analysis indicate the obsidian was obtained from Big Southern Butte in southwestern Idaho (Hughes 2008). Obsidian hydration analysis indicated the obsidian is marked by a hydration band measuring 4.1 microns, however, no dating rates for the source were known by the analyst, nor were any induced hydration studies completed. Consequently, the piece was not dated (Origer 2009).

Flake Type

Flake types are dominated by the smallest, untyped flakes, although simple and complex types are common (Table 16). Few biface thinning flakes are present, either percussion or pressure flakes. Likewise, shatter is also rare.

Table 16. Distribution of debitage type

Activity Area	Shatter	Percussion biface thinning	Simple	Complex	Pressure biface thinning	Untyped (SG 4)	TOTAL
H15AA	1	--	4	6	1	17	**29**
%	*3.4*	--	*13.8*	*20.7*	*3.4*	*58.6*	***3.7***
H15AAA	--	--	4	10	1	25	**40**
%	--	--	*10.0*	*25.0*	*2.5*	*62.5*	***5.2***
H17AA	--	--	5	10	--	43	**58**
%	--	--	*8.6*	*17.2*	--	*74.1*	***7.5***
H18AA	1	--	19	23	5	117	**165**
%	*0.6*	--	*11.5*	*13.9*	*3.0*	*70.9*	***21.3***
NFDA	5	1	121	114	3	238	**482**
%	*1.0*	*0.2*	*25.1*	*23.7*	*0.6*	*49.4*	***62.3***
TOTAL	**7**	**1**	**153**	**163**	**10**	**440**	**774**
% of total	***0.9***	***0.1***	***19.8***	***21.1***	***1.3***	***56.8***	***100.0***

Cortical Retention

Interior or non-cortical flakes comprise 88.0% of the assemblage, with cortical flakes present though not abundant (Table 17). No cortex was noted on basalt, obsidian, or siltstone flakes.

Table 17. Distribution of non-cortical and cortical debitage by material type

Raw Material	Non-cortical		Cortical		TOTAL	
	n	%	n	%	n	%
Activity Area H15AA						
Chalcedony/chert	19	*76.0*	6	*24.0*	**25**	***3.2***
Quartz/quartzite	4	*100.0*	--	--	**4**	***0.5***
Activity Area H15AAA						
Chalcedony/chert	28	*93.3*	2	*6.7*	**30**	***3.9***
Quartz/quartzite	9	*90.0*	1	*10.0*	**10**	***1.3***
Activity Area H17AA						
Chalcedony/chert	48	*92.3*	4	*7.7*	**52**	***6.7***
Quartz/quartzite	6	*100.0*	--	--	**6**	***0.8***
Activity Area H18AA						
Basalt	8	*100.0*	--	--	**8**	***1.0***
Chalcedony/chert	126	*86.9*	19	*13.1*	**145**	***18.7***
Quartz/quartzite	10	*83.3*	2	*16.7*	**12**	***1.6***
NFDA						
Basalt	2	*100.0*	--	--	**2**	***0.3***
Chalcedony/chert/petrified wood	350	*86.6*	54	*13.4*	**404**	***52.2***
Obsidian	1	*100.0*	--	--	**1**	***0.1***
Quartz/quartzite	68	*93.2*	5	*6.8*	**73**	***9.4***
Siltstone	2	*100.0*	--	--	**2**	***0.3***
TOTAL	**681**	***88.0***	**93**	***12.0***	**774**	***100.0***

Burning

Less than 20% of the debitage recovered was subjected to thermal alteration in the form of either heat treatment or burning (Table 18). Of those thermally altered, most were simply burned rather than apparently intentionally heat altered.

Table 18. Distribution of heat altered or burned debitage

Activity Area	Heat-altered	Burned	TOTAL	% of Activity Area
H15AA	--	2	**2**	6.9%
H15AAA	--	7	**7**	17.5%
H17AA	1	7	**8**	13.8%
H18AA	1	16	**17**	10.3%
NFDA	9	109	**118**	24.5%
TOTAL	**11**	**141**	**152**	
% of site total	**1.4%**	**18.2%**	**19.6%**	

Summary of Flaked Stone Tools and Debitage

The lithic assemblage is dominated by local materials, mostly Morgan-Madison and Bridger chert variants. All three of the hafted bifaces, all of the flake tools, and most of the unhafted bifaces are this material. The one core present is also a variant of Bridger chert, with no cortex remaining. The lack of cortex and its small size indicate the core had been utilized to exhaustion, perhaps the reason it had been abandoned. The patterned tools exhibit light to no use wear along their edges, however, the flake tools were heavily utilized. About half of the flake tools exhibit heavy use, either as one edge heavily utilized edge, or several edges present on one flake. This seems to contrast the dominant activity inferred from the debitage assemblage, which indicates tool maintenance. It is possible, however, that some of these patterned bifaces, both hafted and unhafted, may have been manufactured on site, although the lack of high numbers of pressure biface thinning flakes contradicts this supposition. The lack of use wear observed on the biface edges could also be a function of resharpening.

The debitage assemblage is likewise dominated by the local materials. Some quartzites are present, most of which is locally available Uinta Mountain quartzite, available from the same locations as the Morgan-Madison and Bridger cherts. Quartzite was present in all activity areas with the exception of F18, the southernmost house. Very little cortical quartzite flakes were recovered from any of the houses or non-floor distributions, indicating there was little core reduction performed on this material at the site. The quartzite was likely reduced elsewhere, then transported to the site.

Other material types include quartz, basalt, siltstone, petrified wood, and obsidian. With the exception of the obsidian, the source of these other materials is not known. These materials are nearly exclusively small flakes (<SG-3). A few larger, SG-2 quartz flakes were recovered from F18. These materials were transported in to the site from elsewhere, having been picked up during the annual rounds, perhaps in a similar way that the obsidian was acquired. For the most part, these other material types are represented by small flakes, both SG-3 and SG-4, and generally non-cortical, suggesting there were tools made from these materials present on the site during occupation. The few small, non-cortical flakes are indicative of maintenance activities, and the lack of such tools mean they were probably taken with the residents when they left.

The flake tools and debitage cluster in and above F18, the southernmost house. Half of the 12 point plotted flake tools were also located either within the perimeter of this house, or in the fill just above it and the core and one of the tested cobbles were found above F18. The debitage shows a similar pattern, with the highest counts recovered from within and above this house, particularly the small, SG-4 flakes. While these small flakes dominate the assemblage in all locations, most of the small flakes from the floor distributions are in this area (27%). Distribution patterns within each house will be discussed in more detail in Chapter 8, however, the majority of debitage within F18 concentrated between the two large, adjacent features (F12, F13), described more fully later in this chapter. The character of the assemblage within all houses indicates later stage knapping (Ahler 1989), with mostly small, non-cortical simple and complex flakes dominating the assemblages. Some core reduction, as well as limited blade production, was most likely occurring within F18, contrasted to mostly maintenance of tools within the other houses.

Both F15 and the anteroom had small assemblages dominated by small, non-cortical flakes, with only quartzite and the local cherts present. Likewise, few tools were point plotted within or above these basins. Tool maintenance appears to be the dominant activity in these locations.

Finally, very little of the lithic assemblage was thermally altered. While heat treating was apparently conducted at the site, this type of thermal alteration accounts for only 1.4% of the debitage total. Most of the heat altered flakes were burned, although this represents less than 20% of the assemblage. It appears that the flakes were not swept into the features during cleaning episodes, and those that were burned may have been inadvertently discarded into the fires during maintenance activities.

NON-CHIPPED STONE ARTIFACTS

Excavations at this site resulted in the recovery of 76 non-chipped stone artifacts, 56 of which are milling implements, or ground stone tools. The remaining 20 artifacts include one hammer stone, nine small round rocks, two polished stones, and eight unmodified manuports. The ground stone tools include 32 manos and mano fragments, 20 metates and metate fragments, and four fragments too small to identify as either a mano or metate. In addition, four metates and two manos were subjected to pollen wash analysis.

Manos

Manos make up 42.1% of the entire non-chipped stone tool assemblage, and 57.1% of the assemblage of milling implements. This category includes both complete (N=13) and incomplete (N=19) specimens (Table 19; Figure 12). One incomplete mano was reconstructed into an incomplete tool from two fragments (Cat. No. 230, 279).

Table 19. Summary of manos

Cat. No. 2009.013.	Completeness	Material type	Length (cm)	Width (cm)	Thickness (cm)	Mass (g)	Burned?
Activity Area H15AA							
746	complete	quartzite	11.9	6.8	5	557	yes
Activity Area H15AAA							
868	incomplete	sandstone	--	--	--	41.9	yes
Activity Area H17AA							
66	complete	quartzite	9.8	6.5	5	513	yes
83	complete	quartzite	12.4	8.5	6.5	680	yes
876	complete	sandstone	12.2	7.8	4.6	707	yes
Activity Area H18AA							
512	complete	quartzite	11.2	11	4.6	680	yes
515	incomplete	sandstone	--	--	--	161	yes
516	incomplete	quartzite	--	--	4.7	162	yes
574	incomplete	sandstone	--	--	--	30	yes
575	complete	quartzite	9.7	9.6	5.4	680	yes
662	incomplete	sandstone	--	--	5.9	480	yes
NFDA							
119	incomplete	quartzite	--	--	--	54	yes
127	incomplete	quartzite	--	--	--	189	yes
184	incomplete	sandstone	--	--	3.5	186	yes
194	incomplete	quartzite	--	--	4.4	311	yes
230	reconstructed w/Cat. No. 279	sandstone	--	8	5.3	451	yes
259	incomplete	quartzite	--	--	--	141	yes
279	reconstructed w/Cat. No. 230	sandstone	--	--	--	--	yes
289	complete	quartzite	13.1	7.7	5.4	907	no
313	complete	quartzite	12.9	7.2	5.5	701	no
321	complete	sandstone	10.8	9.7	3.9	453	yes

Cat. No. 2009.013.	Completeness	Material type	Length (cm)	Width (cm)	Thickness (cm)	Mass (g)	Burned?
			NFDA				
322	incomplete	sandstone	10.9	8	--	517	yes
359	complete	quartzite	11.8	8.5	4.8	601	yes
373	complete	sandstone	10.3	9.1	5.2	680	yes
397	complete	sandstone	10.6	7.5	4.9	456	no
425	incomplete	sandstone	--	--	--	20	yes
446	incomplete	sandstone	--	--	--	220	yes
655	incomplete	sandstone	--	--	4.6	260	yes
671	incomplete	quartzite	--	--	--	292	yes
774	incomplete	sandstone	--	--	4.6	191	no
775	complete	quartzite	12.1	7.5	5.5	610	yes
815	incomplete	quartzite	--	--	--	131	yes
840	incomplete	quartzite	--	--	--	104	yes

Both sandstone and quartzite were utilized in the manufacture of the manos, with slightly more quartzite than sandstone (sandstone = 48.48%; quartzite = 51.51%).

All four measurements (length, width, thickness, mass) were taken only from complete or nearly complete artifacts, however, mass was recorded for all (see Table 19). Three fragments, including two that refit, are sufficiently complete to measure three dimensions, six fragments are sufficiently complete to obtain thickness, and the remaining fragments (N=11) are too incomplete to measure any dimension other than mass. They average 11.5 cm long, 8.3 cm wide, and 5.1 cm thick.

Manufacturing Process and Intensity

Manufacturing processes include grinding, grinding and pecking, and pecking, with 3.1% unmodified (N=1) and 3.1% unknown (N=1) (Table 20). Approximately half of the manos are ground and pecked, with 37.5% ground only.

Figure 12. Representative mano, Cat. No. 2009.013.289

Table 20. Summary analysis of manos

Cat. No. 2009.013.	Manufacture process	Manufacture intensity	No. of Use Facets	Wear type 1	Wear type 2	Wear type 3	Wear intensity 1	Wear intensity 2	Wear intensity 3
Activity Area H15AA									
746	grinding	2	3	grinding polish striations pecking	grinding striations	battered	heavy	heavy	heavy
Activity Area H15AAA									
868	grinding	9	1	grinding polish striations			light		
Activity Area H17AA									
66	unmodified	0	3	grinding	grinding	battered	heavy	heavy	heavy
83	grinding pecking	2	3	grinding striations	grinding	grinding	light	light	light
876	pecking	1	3	grinding polish striations	grinding polish striations	grinding	heavy	light	heavy

Cat. No. 2009.013.	Manufacture process	Manufacture intensity	No. of Use Facets	Wear type 1	Wear type 2	Wear type 3	Wear intensity 1	Wear intensity 2	Wear intensity 3
Activity Area H18AA									
512	grinding pecking	3	3	grinding polish	grinding pecking	grinding polish	heavy	heavy	heavy
515	grinding pecking	4	2	grinding striations pecking	grinding pecking		heavy	heavy	
516	grinding pecking	2	3	grinding polish striations	grinding polish striations	battered	heavy	heavy	heavy
574	grinding	4	1	grinding polish striations			heavy		
575	pecking	1	1	polish			light		
662	grinding pecking	4	2	grinding striations	grinding striations		light	light	
NFDA									
119	grinding	2	1	grinding polish			light		
127	grinding pecking	3	2	grinding	grinding		heavy	heavy	
184	grinding pecking	4	3	grinding pecking	battered	grinding pecking	heavy	light	heavy
194	grinding	4	3	grinding striations	grinding striations	battered	heavy	heavy	light
230	grinding pecking	3	2	grinding pecking	grinding pecking		heavy	heavy	
259	grinding	3	1	grinding			light		
279	grinding pecking	3							
289	grinding pecking	4	3	grinding striations pecking	grinding striations pecking	battered	heavy	heavy	light
313	grinding pecking	2	2	grinding polish striations	grinding polish pecking		light	light	
321	grinding pecking	1	3	grinding striations pecking	grinding striations pecking	battered	heavy	heavy	light
322	grinding pecking	4	2	grinding	grinding		heavy	heavy	
359	grinding pecking	4	2	grinding striations	grinding striations		light	light	
373	grinding	2	3	grinding polish striations	grinding	grinding polish	light	light	light
397	grinding pecking	3	1	grinding striations pecking			heavy		
425	unknown	9	1	grinding polish			heavy		
446	grinding	2	1	grinding polish			light		

Cat. No. 2009.013.	Manufacture process	Manufacture intensity	No. of Use Facets	Wear type 1	Wear type 2	Wear type 3	Wear intensity 1	Wear intensity 2	Wear intensity 3
				NFDA					
655	grinding pecking	4	3	grinding polish striations pecking	grinding pecking	battered	heavy	heavy	light
671	grinding	2	1	grinding			light		
774	grinding pecking	4	2	grinding striations pecking	grinding		heavy	light	
775	grinding	3	2	grinding striations	battered		light	light	
815	grinding	3	1	grinding			light		
840	grinding	2	1	grinding polish			light		

Manufacturing intensity: 0 = unmodified; 1 = 1-25%; 2 = 26-50%; 3 = 51-75%; 4 = 76-100%; 9 = unknown

A little over half of the manos and mano fragments (53.2%) were intensively processed, indicating more than 50% of the individual tool was subjected to manufacturing processes intended to obtain the desired configuration of shape and use surface.

Use Wear and Intensity

More than half (62.5%) of the manos recovered from the site exhibit use wear on two or more surfaces (see Table 20). Nine manos (five complete, four incomplete) are battered on one end, indicating reuse as hammer stones. About 37.5% exhibit use wear on only one surface, or only one milling surface was identified, 50.0% have two identified use surfaces, and 12.5% have three identified use facets.

Grinding is the most common type of wear, with 98.7% of the manos exhibiting this wear on all of their milling facets. One mano (Cat. No. 575) exhibited only light polish on its one identified use surface. Striations are the second most common wear type at 56.3%, 43.8% of the manos exhibit polish, and finally, 34.4% were pecked for the purposes of resharpening. Six of the manos exhibit only grinding on their identified use surfaces, and the remainder of the manos and mano fragments have a combination of the different wear types.

Slightly more individual manos across the site were heavily used than lightly used. On the other hand, more of the manos that were reused as pounders were lightly utilized. Overall, the intensity of use wear is evenly distributed between those that were lightly utilized (40.6%) and those that were heavily utilized (50.0%). Two manos (Cat. No. 774, 876) exhibit a mix of utilization intensity on their use surfaces (see Table 20).

Burning

The majority of manos (87.9%) exhibit thermal alteration in the form of heat cracks and/or reddening. Eighteen of the burned manos are fragments and were likely last used as FCR. Only one fragment did not exhibit thermal shock. The majority of the burned fragments were relatively large, greater than 5 cm, indicating they were not used repeatedly in the hearths.

A red ochre stain was noted on one facet of a complete mano (Cat. No. 746), suggesting the tool may have been used to grind pigment.

Metates

Metates constituted 26.3% of the non-chipped stone tool assemblage, and 35.7% of the milling implements. This category includes complete metates, nearly complete metates, and fragments. There are significantly more fragments (N=18; 90.0%) than nearly complete metates (N=2; 10.0%) (Table 21). Eight of the metate fragments are sizeable slabs that were too incomplete to confidently measure most of the dimensions except mass. One of the two nearly complete metates was reconstructed from five fragments (Cat. No. 229, 914, 915, 916, 917) (Figure 13). These five fragments were found from different proveniences across the site, both horizontally and vertically, although all five were in the general area of F18. One fragment was recovered from near F17. The distribution of this artifact, both vertically and horizontally, suggests the thick nature of the sediments overlying the houses were a result of cultural activity. The fragments could easily have been kicked around during occupation. On the other hand, it must be noted that this area of the site was heavily impacted by burrowing animals. This activity could have churned the deposits and moved the artifacts from their original discard locations, however, the artifacts did not move far.

Table 21. Summary of metates

Cat. No. 2009.013.	Completeness	Material type	Length (cm)	Width (cm)	Thickness (cm)	Mass (cm)	Burned?
Activity Area H15AA							
456	incomplete	sandstone	--	--	1.7	75	no
485	incomplete	sandstone	--	--	--	1058	yes
Activity Area H17AA							
35	incomplete	sandstone	--	--	3	209	yes
299	incomplete	quartzite	--	--	--	958	yes
Activity Area H18AA							
576	incomplete	sandstone	--	20.8	--	1371	yes
NFDA							
18	incomplete	sandstone	--	--	2.8	494	yes
120	incomplete	sandstone	--	--	2.6	211	yes
160	incomplete	sandstone	--	--	1.4	46	no
229	reconstructed w/Cat. No. 914, 915, 916, 917	sandstone	--	20.4	2.9	2412	yes
236	incomplete	sandstone	--	--	2.9	907	no
262	incomplete	sandstone	--	--	2.9	400	yes
342	incomplete	quartzite	--	--	5.3	302	yes
444	incomplete	sandstone	--	--	--	618	no
479	incomplete	quartzite	--	--	--	7	no
488	incomplete	sandstone	--	--	2.7	3039	no
506	incomplete	sandstone	--	--	--	67	yes
573	nearly complete	sandstone	37.7	25.6	3.9	5817	no
604	incomplete	sandstone	--	--	2.7	145	yes
636	incomplete	sandstone	--	--	--	110.4	yes
889	incomplete	sandstone	--	--	--	49	no

Cat. No. 2009.013.	Completeness	Material type	Length (cm)	Width (cm)	Thickness (cm)	Mass (cm)	Burned?
NFDA							
914	reconstructed w/Cat. No. 229, 915, 916, 917	sandstone	--	--	--	--	yes
915	reconstructed w/Cat. No. 229, 914, 916, 917	sandstone	--	--	--	--	yes
916	reconstructed w/Cat. No. 229, 914, 915, 917	sandstone	--	--	--	--	yes
917	reconstructed w/Cat. No. 229, 914, 915, 916	sandstone	--	--	--	--	yes

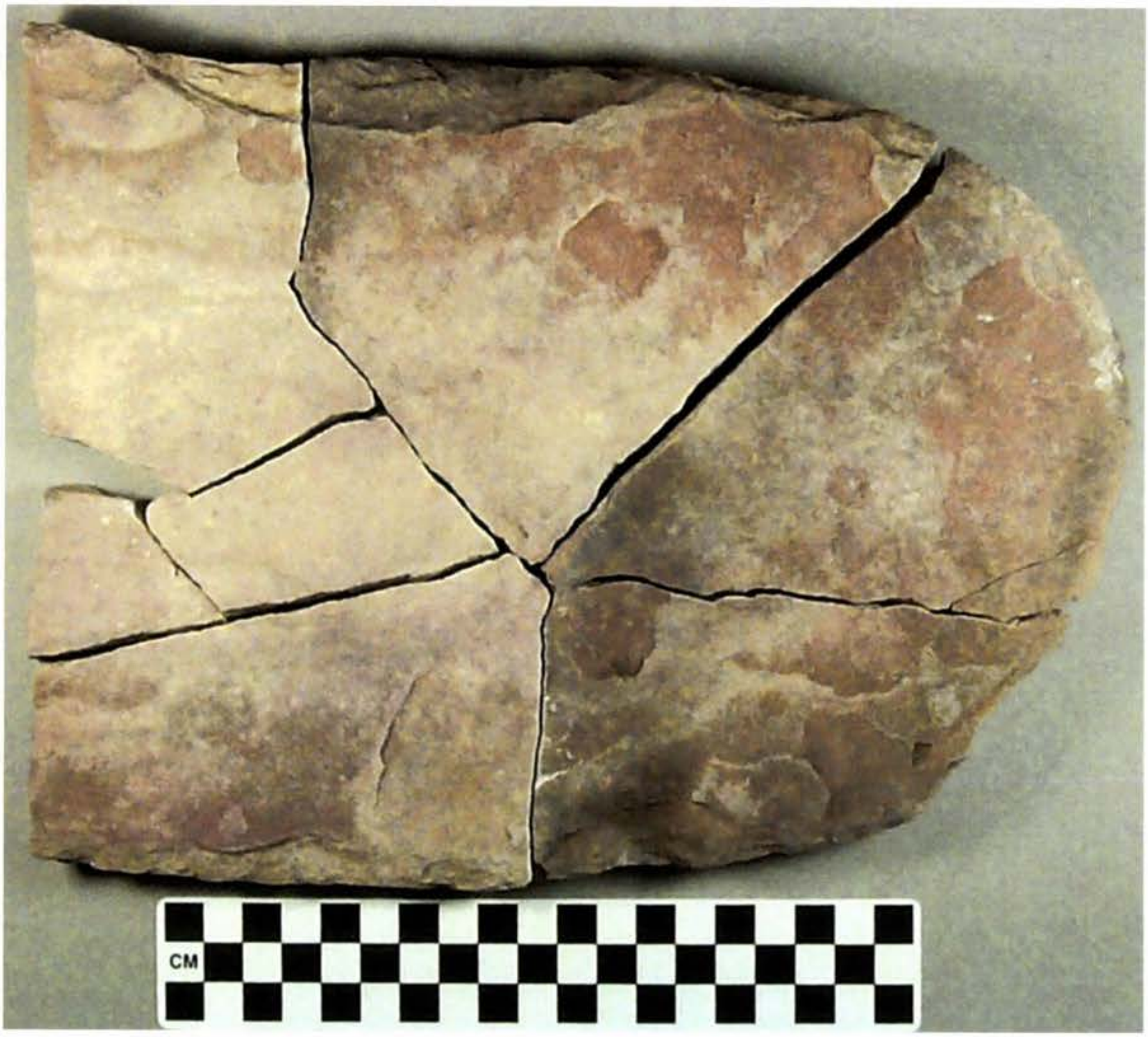


Figure 13. Metate reconstructed from Cat. No. 2009.013.299, 914, 915, 916, and 917

The majority of metates and fragments are sandstone (85.0%), while a portion is quartzite (15.0%). Complete measurements were obtained for the nearly complete metate. Three measurements were recorded for the reconstructed metate, and two measurements were taken from half of the fragments (50.0%) (see Table 21).

Manufacturing Process and Intensity

Manufacturing processes include flaking, grinding, pecking, and combinations of these processes. One metate fragment is unmodified, four are too fragmentary to determine presence or absence of manufacturing process, and the remaining 15 metates, including the nearly complete slabs, have been subject to one or more manufacturing processes (Table 22). The largest percentage (61.0%) of metate fragments exhibit some grinding, either by itself or in combination with pecking and/or flaking; 27.8% of the fragments are flaked, again either alone or in combination with an additional process; and 50.0% had been pecked, always in combination with an additional process.

Table 22. Summary analysis of metates

Cat. No. 2009.013.	Manufacture process	Manufacture intensity	No. of Use Facets	Wear type 1	Wear type 2	Wear intensity 1	Wear intensity 2
Activity Area H15AA							
456	grinding pecking	4	1	grinding		heavy	
485	flaking	2	1	grinding polish striations pecking		heavy	
Activity Area H17AA							
35	grinding pecking	4	1	grinding striations pecking		heavy	
299	flaking pecking	9	2	grinding	grinding polish	heavy	heavy
Activity Area H18AA							
576	grinding flaking	4	2	grinding polish striations pecking	grinding striations pecking	heavy	heavy

Cat. No. 2009.013.	Manufacture process	Manufacture intensity	No. of Use Facets	Wear type 1	Wear type 2	Wear intensity 1	Wear intensity 2
NFDA							
18	grinding pecking flaking	4	1	grinding pecking		heavy	
120	grinding pecking	4	1	grinding		heavy	
160	grinding	3	1	grinding		heavy	
229	flaking grinding	4	2	grinding polish striations pecking	grinding polish striations pecking	heavy	heavy
236	grinding pecking	4	1	grinding		light	
262	grinding pecking	4	2	grinding striations	grinding	light	light
342	grinding pecking	4	2	grinding striations	grinding	light	light
444	unmodified	0	1	grinding striations		light	
479	unknown	9	2	grinding polish striations	grinding	heavy	light
488	flaking grinding	3	2	grinding polish striations pecking	grinding striations pecking	heavy	heavy
506	unknown	9	1	grinding polish		light	
573	flaking	1	2	grinding pecking	grinding striations pecking	heavy	heavy
604	grinding pecking	4	2	grinding striations	grinding striations pecking	heavy	heavy
636	unknown	9	1	grinding		light	
889	unknown	9	1	grinding		light	

Manufacturing intensity: 0 = unmodified; 1 = 1-25%; 2 = 26-50%; 3 = 51-75%; 4 = 76-100%; 9 = unknown

Over half (61.0%) of the metate fragments were intensively processed, while 27.8% are unknown, and the remainder (11.2%) were either unmodified or lightly processed. One nearly complete, reconstructed metate was intensively processed by flaking and grinding the edges to shape the slab. The second nearly complete metate (Cat. No. 573) was lightly processed through flaking to shape the slab.

Use Wear and Intensity

Both of the nearly complete slab metates have two use facets each, which were heavily utilized. Use wear exhibited includes all four types on both facets on one (Cat. No. 229), while Cat. No. 573 exhibits grinding, striations, and pecking on one facet and grinding and pecking on the other (see Table 22).

Seven metate fragments were bifacially utilized, and one facet was identified on 11 fragments. Wear types include grinding, pecking, striations, and polish. Nearly all metate fragments exhibit grinding, with one exception (Cat. No. 569). Six fragments were ground only on their single identified use facet. Six fragments were pecked along with at least grinding on one or both facets; nine fragments exhibit striations as well as one or more additional types of use wear; and six fragments are also polished.

Most of the metate fragments (55.6%) were heavily used on one or both facets, 35.0% were lightly used on one or both facets, and one metate fragment (5.0%) exhibits heavy wear on one facet and light wear on the other.

Burning

More than half (61.1%) of the metate fragments, as well as the nearly complete, reconstructed metate, exhibit thermal alteration. This reconstructed metate also exhibits red ochre staining on both facets.

Unidentified Fragments

In addition to the identified ground stone tools, there are four ground stone fragments that are clearly ground but too fragmentary to identify as either a mano or a metate. Three of the four are sandstone, and one is quartzite (Table 23). All four are edge fragments, therefore, the manufacturing process was identifiable, although processing intensity is unknown. Two are ground only, and two are ground and pecked. All of the fragments exhibit grinding on their only identified use facet, and two have striations; one is also polished. Two of the fragments exhibit heavy wear, and the other two fragments were lightly used (Table 24). Only one unknown fragment was burned (Cat. No. 779). The remainder did not exhibit thermal alterations.

Table 23. Summary of unknown ground stone

Activity Area	Cat. No.	Material type	Length (cm)	Width (cm)	Thickness (cm)	Mass (g)	Burned?
NFDA	282	sandstone	--	--	--	6	no
	436	quartzite	--	--	--	11	no
	546	sandstone	--	--	--	16	no
	779	sandstone	--	--	--	59	yes

Table 24. Summary analysis of unknown ground stone

Activity Area	Cat. No. 2009.013.	Manufacture process	Manufacture intensity	No. of Use Facets	Wear type 1	Wear intensity 1
NFDA	282	grinding	9	1	grinding	heavy
	436	grinding pecking	9	1	grinding striations	light
	546	grinding	9	1	grinding polish	light
	779	grinding pecking	9	1	grinding striations pecking	heavy

Manufacturing intensity: 0 = unmodified; 1 = 1-25%; 2 = 26-50%; 3 = 51-75%; 4 = 76-100%; 9 = unknown

Summary of Milling Implements

Despite the fragmentary nature of the milling implement assemblage, more manos than metates are represented, and more of the manos than metates are complete artifacts. Only two nearly complete metates were recovered. The rest of the metates are fragments. Quartzite is the most common material type utilized for manos and mano fragments, while the majority of metates, including fragments and the two nearly complete slabs, are made from a fine-grained sandstone. Manos and mano fragments are fairly evenly divided between those that were intensely manufactured and those that were lightly manufactured. Likewise, utilization of the manos and mano fragments was also relatively evenly divided between those that had been heavily used and those that had been lightly used. Those metate fragments for which intensity of manufacturing could be determined were generally more intensely processed than not. Likewise, utilization of the identified facets was heavy for most of the fragments. The two nearly complete slab metates were both heavily utilized, although one was intensely manufactured while the other was not. Overall, the metates were intensely utilized, apparently to the point to which they were broken and discarded. The size of the slabs suggests they were left at the site as site furniture, and the complete slab was discovered next to F8 with its use side facing down. Very few of the metate fragments exhibit evidence of thermal shock. The manos, on the other hand, tend to be both less intensely modified for use and less intensely utilized. The mano assemblage also included more complete tools than the metate assemblage. Finally, the manos were more heavily burned, indicating their last use was as roasting stones in the hearths.

Select ground stone, mostly metates, were washed for pollen. These ground stone were chosen based on if they were in good context, meaning they were clearly associated with a feature, and how easily identifiable the use facet was, which generally meant heavy use wear. The results are presented in more detail in the following chapter (Chapter 7). The analysis resulted in the identification of several pollen types, all of which are economically useful, however, none were at levels above that of the background pollen rain, determined by several control samples. The control samples were composed of soil that had been collected from the same general level as the ground stone, although not in close proximity. Interestingly, grass pollen was present in the ground stone wash samples in elevations higher than what had been identified in the control samples. This indicates grasses may have been processed with these tools.

The milling implements at 5MF6255 make up 62% of the stone tool assemblage, comprising the largest class of tools present here. While other sites in the region have high total numbers of ground stone tools present, such as at 5MF3006 (Graham 2000; Elkins and Metcalf 2010), these sites also have high numbers of other tools as well, meaning the ground stone assemblage comprises a smaller portion of the stone tool assemblages. Since a high proportion of the tools at 5MF6255 are milling implements, activities were apparently focused on the processing of plants. The large slab metates were clearly left at the site for later use, with one turned upside down to protect the use surface from the elements. Such artifacts are typically referred to as site "furniture" (Binford 1978, 1980) and are left at a site because the artifact weighs too much for a mobile group, and the intention is to return to the same location and reuse the tool.

The plant processing activities were concentrated in and around F18, with the highest numbers of all types found adjacent to this house (see Figure 10, Figure 14, and Figure 15). No ground stone were recovered from the anteroom, although at least one was recovered from the levels above the floor. Likewise, F15 contained few milling implements, suggesting plant processing was not a primary activity in these locations. Ground stone that had been subjected to pollen wash analysis were recovered from all houses except the anteroom, and all of the ground stone returned higher elevations of grass pollen. It appears that grasses were processed in all houses during at least one occupation of each of the houses.

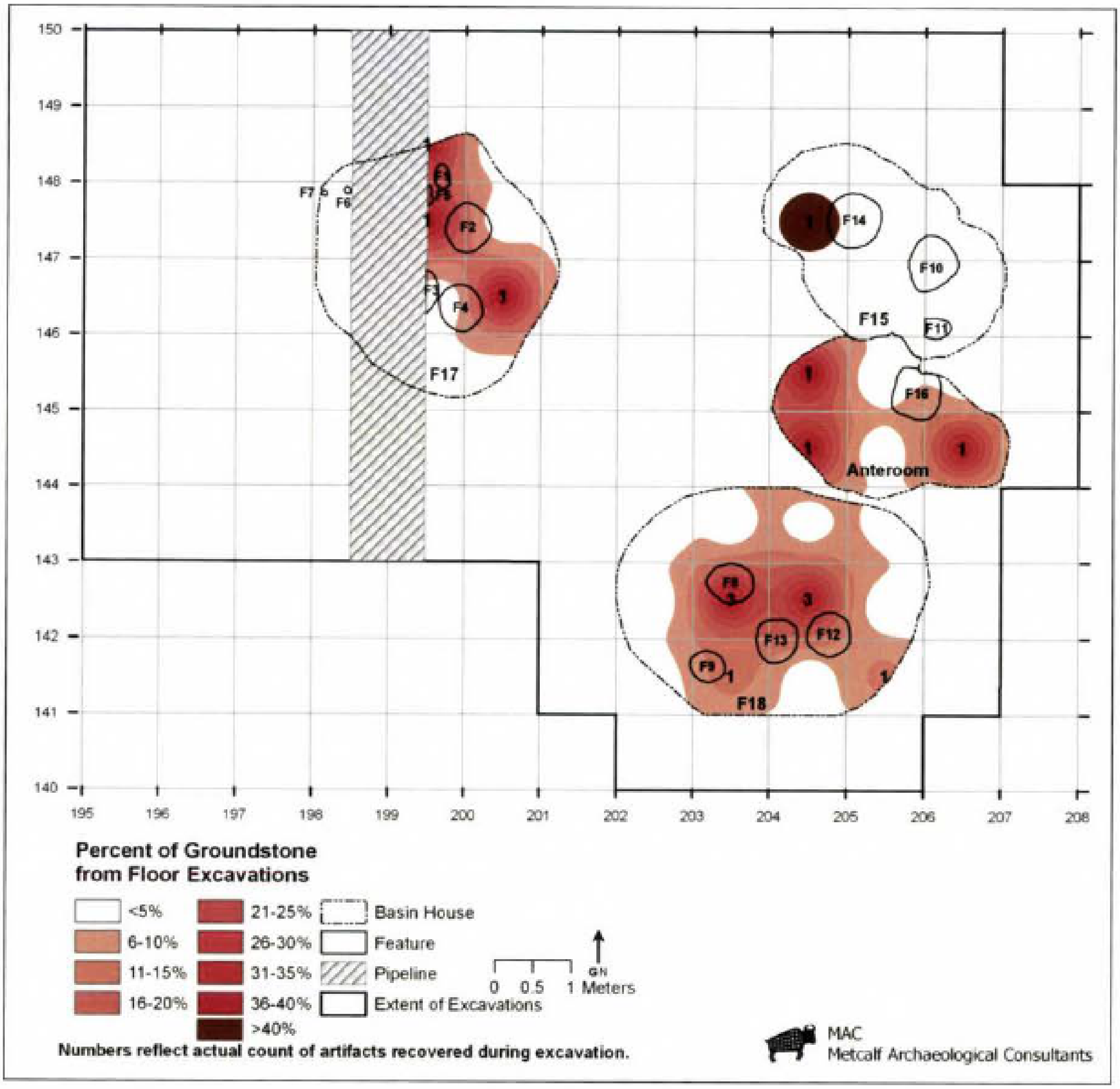


Figure 14. Floor distributions of ground stone tools

Hammer Stone

One dedicated hammer stone (Cat. No. 539) was recovered from the site, and nine manos were reused as hammer stones. The manos reused as hammer stones are described in the section above. The hammer stone is an incomplete quartzite cobble that measures 5.6 cm wide by 2.6 cm thick and weighs 114 g; both ends have been battered and exhibit heavy use-wear.

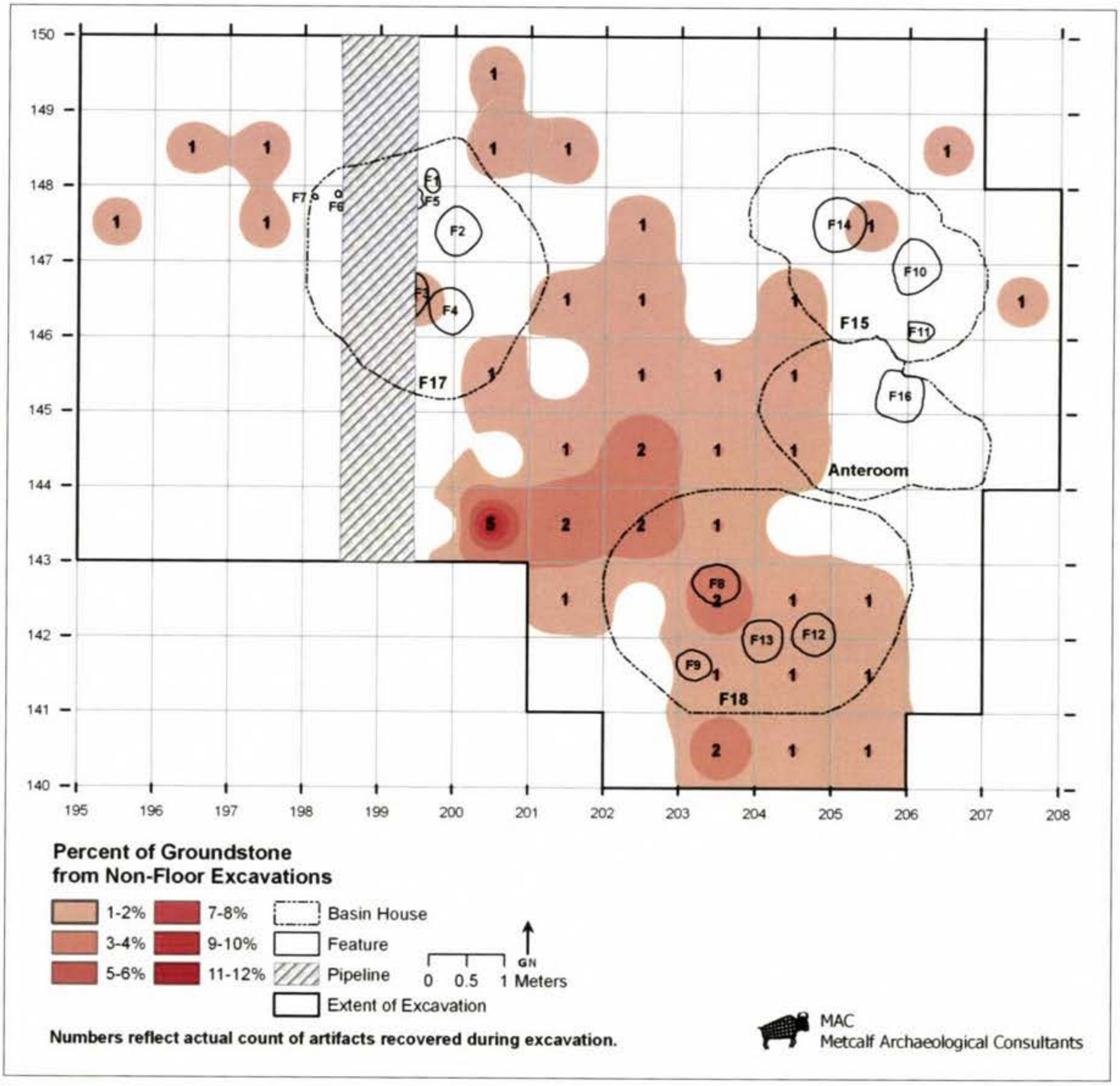


Figure 15. Non-floor distributions of ground stone tools

Manuports

This category includes eight unmodified cobbles of sizes not commonly found in the excavated portion of the site area. Five of the cobbles are coarse-grained, friable sandstone and two are quartzite. All of them weigh more than 200 g (Table 25). With the exception of two (Cat. No. 114, 766), the manuports were recovered from near the base of excavations around F17 and F18. Cat. No. 114 was recovered from the upper levels of the cultural level just to the north of F17, and Cat. No. 766 was recovered from F10 in F15. No naturally occurring cobbles or large pebbles were noted in the cultural level during excavation, indicating these cobbles were brought in by human agents rather than natural occurrences.

Table 25. Summary of manuports and other non-chipped stone artifacts

Cat. No. 2009.013.	Class	Completeness	Material type	Length (cm)	Width (cm)	Thickness (cm)	Mass (g)
Activity Area H15AA							
766	manuport	incomplete	sandstone	--	--	--	1.4
Activity Area H18AA							
718	manuport	incomplete	quartzite	--	14.5	7.6	405
NFDA							
114	manuport	nearly complete	sandstone	7.8	6.8	6.5	446
175	manuport	nearly complete	sandstone	10.4	7	5	377
197	manuport	complete	sandstone	13.9	5	5	466
235	manuport	complete	sandstone	8.5	7.9	3.6	330
713	manuport	complete	quartzite	14.7	8	3.5	576
827	manuport	complete	sandstone	8	6.4	2.8	218

Four of the larger sandstone manuports (Cat. No. 114, 175, 197, 235) are similar. These four are all deteriorating, highly friable, coarse-grained sandstone cobbles. There is what appears to be pecking along their margins, but this pecking is not clearly cultural. It could be the result of cultural modification, natural degradation of the sandstone, or material attrition during post-excavation cleaning and analysis. Cat. No. 114 is somewhat rounded, with two flattened sides with no grinding or polish evident on these surfaces. The manuport appears to have been a tabular stone at one point, hence the flattened sides. Cat Nos. 175 and 235 are oval to teardrop shaped. Both stones are coated in a calcium carbonate crust, particularly along the underside of the artifacts. This coating seems to have preserved small cupules, suggesting the stones may have been culturally modified. Both of these artifacts appear to have been heated, with some blackening and limited fractures, although the staining is just as likely a result of their location within the cultural sediments. Cat. No. 197 is more of a rounded crescent shape. One side has smooth patches with flattened crowns of the sand grains, suggestive of grinding. The function of these manuports is unknown, although it is possible they were used as source materials to obtain coarse sand. One piece of burned and tempered clay (described below) was recovered adjacent to F18 and it is possible that these manuports were ground or pecked to obtain the temper for the clay.

Other Non-Chipped Stone Artifacts

Eleven other artifacts were recovered from the cultural level at the site. These include nine small, round, pieces of sandstone and two polished stones (Table 26). The round stones are all coarse-grained, friable pieces of sandstone. They are evenly shaped and typically round to oval, although no obvious modification was noted, such as grinding or polishing (Figure 16). Their function is unknown. It is possible these stones may be sling shots or bola stones, possibly gaming pieces, or tension controllers for drums.

Table 26. Summary of other non-chipped stone artifacts

Cat. No. 2009.013.	Class	Completeness	Material type	Length (cm)	Width (cm)	Thickness (cm)	Mass (g)
Activity Area H17AA							
298	manuport, poss sling shot	complete	sandstone	3.3	2.7	1.6	19

Cat. No. 2009.013.	Class	Completeness	Material type	Length (cm)	Width (cm)	Thickness (cm)	Mass (g)
Activity Area H15AAA							
455	manuport, poss sling shot	nearly complete	sandstone	3.3	3.4	3.2	50
NFDA							
113	manuport, poss sling shot	complete	sandstone	4.2	3.9	2.9	60
177	manuport, poss sling shot	complete	sandstone	2.8	2.7	2.3	23
251	polished stone	nearly complete	sandstone	4	3.1	2	32
NFDA							
569	polished stone	complete	quartzite	16.2	10.6	5.9	907
570	manuport, poss sling shot	complete	sandstone	2.8	2.6	2.2	24
875	manuport, poss sling shot	nearly complete	sandstone	2.7	2.3	1.7	16
890	manuport, poss sling shot	complete	sandstone	1.8	1.8	1.7	7
891	manuport, poss sling shot	complete	sandstone	3.2	2.3	2.6	30
892	manuport, poss sling shot	complete	sandstone	4.5	3.2	2	35

Two other artifacts (Cat. No. 251, 569) exhibited light polish on one small facet each, but were not otherwise modified. Both were from the fill above the house floors. One (Cat. No. 251) is a small, nearly complete pebble of sandstone, and the other (Cat. No. 569) is a large, complete quartzite cobble. As with the small round stones, the function of these two stones is unknown, although the quartzite cobble may have been collected for later use as a source of lithic raw material. Alternatively, it may have been intended for use as a hide polisher or milling implement. The sandstone piece could have been a game piece and the polish resulting from rubbing the pebble across a surface during game playing.

Summary of Non-Chipped Stone Artifacts

Included in this category are one hammer stone, eight manuports, and 11 modified stones of unknown function. The hammer stone is the only dedicated hammer

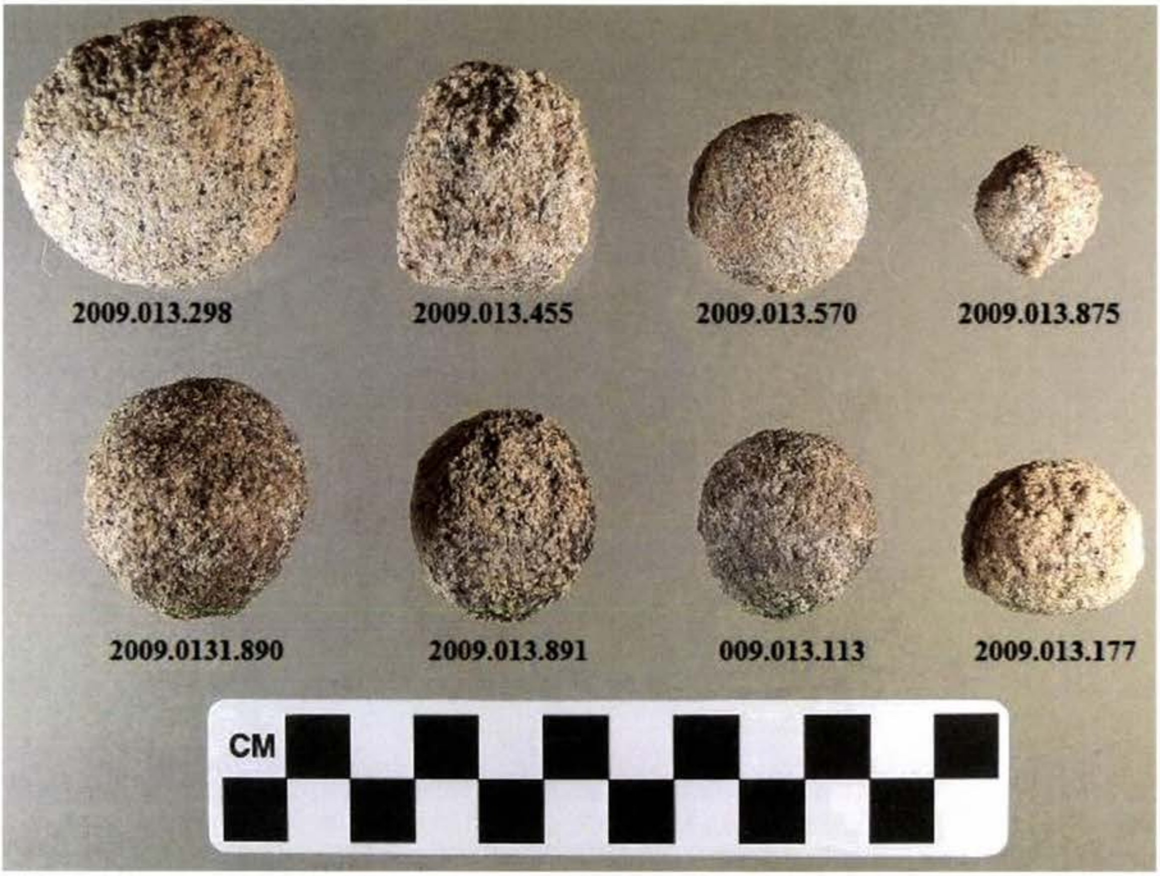


Figure 16. Small round stones, unknown function

stone recovered from the cultural level, although several of the manos had been reused as pounders. The manuports are notable only because of their unusual presence in aeolian deposits. The nine small, round, sandstone pebbles were clearly modified, whether culturally or naturally is unclear. Their function is also equivocal, although several hypothesis have been offered. The stones could be ammunition for sling shots or bola stones for hunting rabbits, an activity that clearly occurred on the site (see below); they could be gaming pieces; or they could possibly be tension controllers for drums.

BURNED CLAY

One small piece of burned clay was recovered from near the base of excavation just to the west of F18. The piece measures 0.9 x 0.6 x 0.4 cm and weighs less than 0.01 g. It is heavily charred and appears to have some sand temper within it. It appears to be incidental to hearth use and not burnt deliberate wattle and daub.

HEAT-ALTERED STONE

Heat-altered stone, generally termed FCR, was largely represented in the excavations by sandstone and quartzite. Only those pieces of stone that did not fall under other artifact classifications (such as non-chipped stone) were included in this category. Rock was divided between large and small sizes. "Large" cobbles or pieces of FCR exceeded five cm in maximum dimension, and "small" pieces measured less than five cm in maximum dimension.

FCR was present at this site in low quantities. A total of 290 pieces weighing 10,001.7 g were recorded (Table 27). Small pieces of FCR were most numerous, and large FCR were far less numerous, although they constituted the largest proportion of the weight. No large clusters or FCR-filled features were observed during excavation. Two pieces were submitted for lipid analysis, described in more detail in the next chapter. One of the samples returned insufficient residues for analysis. The second piece, recovered from the floor of F15, returned specific isomers that indicate the rock had been in a feature in which fatty meat combined with plants with a high fat content, such as seeds or nuts, were processed. It is not possible to say which feature was utilized for processing such foods since the sample was not recovered from a feature. Additionally, most of the mano fragments had been last used as FCR and fall under the "large category but are not included in the counts in Table 27. Several mano fragments (N=7) were less than 5 cm and weighed a total of 521.9 g. Twelve mano fragments, weighing 3229 g, were larger than 5 cm.

Table 27. Summary of FCR by activity area

Activity Area	Size less than 5 cm		Size greater than 5 cm		TOTAL	
	Count	Mass (g)	Count	Mass (g)	Count	Mass (g)
H15AA	5	130	2	181.7	**7**	**311.7**
H15AAA	--	--	--	--	**--**	**--**
H17AA	10	110	1	110	**11**	**220**
H18AA	86	700	15	2050	**101**	**2750**
NFDA	137	2160	34	4560	**171**	**6720**
TOTAL	**238**	**3100**	**52**	**6901.7**	**290**	**10001.7**

Experiments with heat-altered stone have demonstrated that size and mass of FCR can sometimes provide insight on the length or intensity of site-occupation. According to replicative experiments investigating the rate of breakdown of stones used in cooking and boiling, porphyritic rhyolite cobbles lose their effectiveness as boiling stones when they are reduced to fragments measuring two to three cm in size and weighing 110 g (Jensen et al. 1999). Small pieces of FCR may have been discarded due to exhaustion of efficient usefulness. Thus, a greater number or mass of small pieces of FCR exhibiting far less average mass than those pieces from the replicative boiling experiments that were considered exhausted could imply longer or more intensive use of the stone and the locale (Jensen et al. 1999). On the other hand, it might simply reflect a difference in material type, a difference in the size of raw material utilized, or a different use for the hearth rocks other than boiling. It seems likely that this data can serve as a proxy to explain the retention and/or discard of types of FCR, e.g., sandstone and quarztite, as well.

The preponderance of small pieces of FCR at 5MF6255, particularly in F18, suggests this house and these features were utilized more than in the other houses. Combined with ground stone data, it seems likely that the features within F18 were utilized to boil plant materials. Meat products should not be ruled out as having been boiled or processed in these features, however, the lack of suitable pieces of FCR from any of the other features, either in direct association with one or recovered from a proximate provenience, negates this line of evidence.

FEATURES

Feature Types

Eighteen features were discovered at 5MF6255, including three basin houses, three possible postmolds, and 12 basin-shaped hearths. All of the smaller features (hearths and postmolds) were discovered within the defined perimeters of the houses. Table 28 summarizes the features and includes descriptions, provenience, size, and associated artifacts.

Table 28. Feature summary information

Feature No.	Activity Area	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts
					N-S	E-W	Depth		
1	H17AA	post mold	147-148N 199E	195	31	20	11	no	bone (16)
2	H17AA	basin hearth	147N 199-200E	200	70	60	6	no	debitage (2) bone (29)
3	H17AA	basin hearth	146N 199E	197	58	18	28	no	debitage (2) bone (56)
4	H17AA	basin hearth	146N 199-200E	190	57	57	24	no	bone (57)
5	H17AA	basin hearth	147N 199E	200	28	8*	16+	no	none
6	H17AA	post mold	147N 198E	190	34	11	14	no	bone (3)

Feature No.	Activity Area	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts
					N-S	E-W	Depth		
7	H17AA	post mold	147N 198E	199	16	14	14	no	bone (1)
8	H18AA	basin hearth	142N 203E	177	55	57	33	no	debitage (5) bone (66)
9	H18AA	basin hearth	141N 203E	155	42	43	4	no	bone (24)
10	H15AA	basin hearth	146-147N 205-206E	160	75	66+	40	no	bone (38)
11	H15AA	basin hearth	146N 206E	160	35+	35+	12+	no	bone (32)
12	H18AA	basin hearth	141-142N 204E	161	64	54	16	no	debitage (3) bone (37)
13	H18AA	basin hearth	141-142N 203-204E	162	52*	53*	19	no	debitage (9) bone (25)
14	H15AA	basin hearth	147N 204-205E	171	66	66	26	yes	debitage (1) bone (39)
15	H15AA	basin house	145-148N 203-207E	132	390	262	45	yes	flaked stone tool (1) ground stone (1) other non-chipped stone artifacts (1) debitage (28) bone (552)
--	H15AAA	anteroom	144-145N 204-206E	160	313	194	10-15	no	ground stone (3) other non-chipped stone artifact (1) debitage (36) bone (273) bone tool (1)
16	H15AAA	basin hearth	145N 205-206E	161	70	77	44*	no	debitage (4) bone (65)
17	H17AA	basin house	145-148N 198-201E	170	340	316	25	no	flaked stone tool (1) ground stone (5) other non-chipped stone artifact (1) debitage (54) bone (1123)
18	H18AA	basin house	141-143N 202-206E	133	380	296	35	no	flaked stone tool (7) ground stone (7) hammer stone (1) other non-chipped stone artifact (1) debitage (148) bone (1135)

+ = incomplete measurement; * = presumed measurement

Basin Houses

Feature 15 was an oval-shaped basin house located in the northeast corner of the excavation block (Figure 17). It was measured along the long axis, oriented 334° north-northwest/south-southeast (Table 29). It appears that during construction of the house,

Figure 17. View east of F15, post-excavation (Roll 06-350, image 033)

the northeastern portion was excavated into the natural slope of the prehistoric landscape, with the wall steeply sloping to the occupation surface. A gap in the southern wall was interpreted to be a doorway. The depth of the house was taken from the upper rim along the other three walls to the general base of excavation. An area of oxidation approximately 60 cm along the wall was observed during excavation. A fairly large, somewhat circular basin lay directly in front of the oxidation on the floor of the house. It was not a feature, rather a deeper undulation of the floor. House fill was a dark brown to black sand loam lightly mottled with a dark yellow brown sand loam. Charcoal flecks were abundant throughout the fill. The base of excavation was defined as where the black and yellow brown mottling became more consistent and the surface was slightly more compact than the upper layers of the fill. Three features (F10, F11, F14), all basin hearths, were located within the house boundaries. F11 was near the southeastern edge just to the east of the presumed doorway, and the other two were more centrally located.

Table 29. Summary of basin house features

Feature No.	Activity Area	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts?
					N-S	E-W	Depth		
15	H15AA	basin house	145-148N 203-207E	132	390	262	45	yes	flaked stone tool (1) ground stone (1) other non-chipped stone artifacts (1) debitage (28) bone (552)
--	H15AAA	anteroom	144-145N 204-206E	160	313	194	10-15	no	ground stone (3) other non-chipped stone artifacts (1) debitage (36) bone (273) bone tool (1)
17	H17AA	basin house	145-148N 198-201E	170	340	316	25	no	flaked stone tool (1) ground stone (5) other non-chipped stone artifact (1) debitage (54) bone (1123)
18	H18AA	basin house	141-143N 202-206E	133	380	296	35	no	flaked stone tool (7) ground stone (7) hammer stone (1) other non-chipped stone artifact (1) debitage (148) bone (1135)

To the south, and adjacent to F15, was another shallow basin that was tentatively identified as a second room attached to F15, referred to as the "anteroom" (Figure 18). This "anteroom" was an oval-shaped, shallow depression that was oriented at 307° northwest/southeast (see Table 29). It was oriented slightly more east/west than F15 and was comparable in size. The perimeter of the "anteroom" was well-defined and regular. The opening that separated the two basins was a low hump, the presumed doorway for

Figure 18. View southwest of F15 "anteroom", post-excavation (Roll 06-350, image 045)

F15. A single feature (F16) was located within the margins of the "anteroom" on the east side of the presumed doorway. The base of excavation was where the black and yellow brown mottling became more consistent and the surface was slightly more compact than the upper layers of the fill. Alternatively, this basin could be a fourth house that was excavated into F15. The northern perimeter of the "anteroom" truncates the curve of the southern wall of F15. This area has been interpreted as a doorway between the two rooms, although it could just as likely be the place where the "anteroom" was superimposed on F15.

F17 was the house identified in the pipeline trench (Figure 19 and Figure 20). About one-third of the house was removed by the trench. F17 lay approximately 3 m west and 10 cm downslope of F15. It was oriented along the pipeline and grid north, and extended onto the west side of the pipeline trench (see Table 29). The basin perimeter on the west side of the trench was harder to define, while the perimeter of the east half was well-defined with a regular outline, which was roughly circular. The floor was gently undulating and followed the natural slope of the prehistoric landform. The walls varied somewhat with generally shallow to moderate slopes (Figure 21). Fill was a black silty sand loam with abundant small charcoal bits. The base of excavation was defined as where the black and yellow brown mottling became more consistent and the surface was slightly more compact than the upper layers of the fill. Seven features (F1-7) were discovered in the interior of F17. Only three interior features (F1, F6, F7), all possible postmolds, were discovered near the outer perimeter. The remaining four features, all basin hearths, were discovered arranged near the center.

F18 was a basin house located approximately 10 cm south of the F15 "anteroom", 2 m south of F15, and nearly 3 m southeast of F17 (Figure 22). F18 was oriented at approximately 289° east/west off true north (see Table 29). The floor of the house sloped more significantly and undulated more dramatically than the other two identified basin houses (F15, F17), although it was relatively level south of the floor features. The north-central half was impacted in prehistory by a drainage channel that flowed west and continued downslope towards Spring Creek. Due to this impact, the northern perimeter was assumed to equate to the top of the northern bank of the channel, although the southern perimeter was well-defined. Overall, the perimeter as defined was regular and

Figure 19. Profile of F17 prior to excavation, view east (Roll 06-252, image 0810)

Figure 20. View east of F17, post-excavation (Roll 06-255, image 019)

slightly oval in shape. Fill was a dark brown to black loamy sand with abundant small charcoal bits. The base of excavation was defined as where the black and yellow brown mottling became more consistent and the surface was slightly more compact than the upper layers of the fill. Four features (F8, F9, F12, F13) were discovered in the interior, all on the south side of the erosional channel.

Alternatively, this area could have been an open-air, hearth-centered activity area that was not necessarily housed within a superstructure. The southern wall follows along the natural slope, with a minor indentation that could be natural. Also, no features reminiscent of

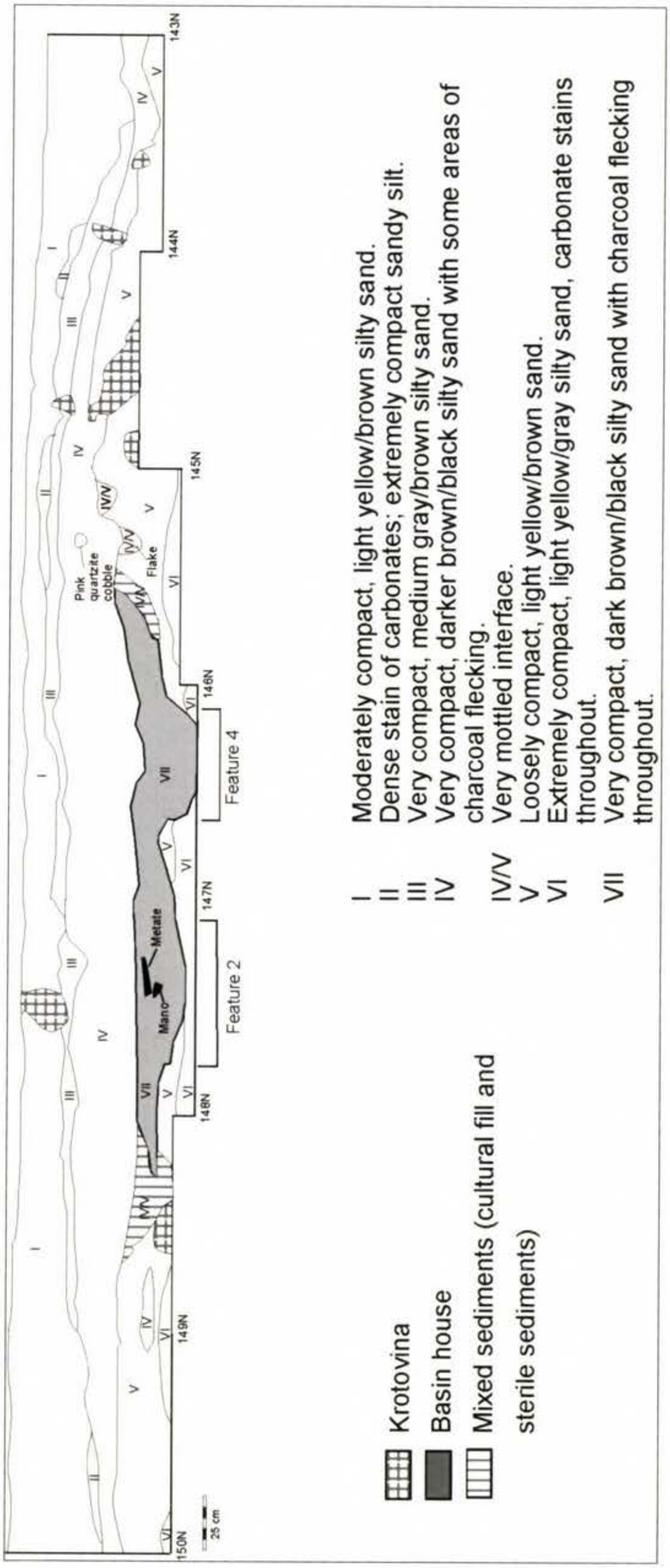


Figure 21. Profile of east wall, 200E

Figure 22. View south of F18, post-excavation (Roll 06-250, image 021)

postmolds were discovered. On the other hand, the curve of the southern wall is regular, with a level floor to the edge of the area impacted by the drainage channel. Additionally, the distribution of artifacts within the confines of the house is very similar to those of the other two houses. The majority of the artifacts recovered from the floor are small lithics and bone, most of which were located along the outside of the house walls. In sum, the lack of any evidence of a superstructure does not preclude the existence of one during occupation; the distribution of artifacts was concentrated within the perimeter of F18, particularly in the bottom 10 cm of all units in and adjacent to the defined house; and the southern wall and floor south of the features was regular and even, contrasted to a natural, undulating surface. F18 was likely a house and not an open-air activity area.

Features 15 and 17 represented small basin houses, while F18 was more amorphous. F15 was oval in shape, and F17 and F18 were more round. All three had a definite basin shape in profile. The perimeters for F15 and F17 were well-defined and the outlines were regular. The floors for these two features were gently undulating and followed the natural slope of the prehistoric landform. The walls varied somewhat, with shallow to moderate slopes. The northeastern wall of F15 dipped sharply from the exterior to the interior. The outline for F18 was indefinite at best. The north side of the basin was cut by a prehistoric drainage channel. The floor was more undulating and uneven, with a sharp dip to the north and west where the channel was located. Adjacent to F15 on the south side was a shallow basin approximately the same size and orientation as the house. It was presumed to represent an extra room associated with F15 and was not given a feature number. It is referred to simply as the "anteroom". Each of the houses had a minimum of two internal features, described below. Seven features were discovered within the boundaries that defined F17, three were within F15, four features were discovered within F18, and one was within the "anteroom". No external features were discovered. Approximately 3 m separated the houses, except the "anteroom" and the presumed northern wall of F18 which was less than 50 cm. Measurements for the houses were along the long axis for the length and perpendicular to the long axis for the width. The depth of each house, measured from the edge of the defined wall to the center of the house, was approximately 20 cm.

Postmolds

Three possible postmolds (F1, F6, F7) were located along the north rim of basin house F17. All three features were small diameter, dark stains only visible once the floor of the house was exposed (Table 30). F1 and F6 exhibited straight sides and a flat bottom, while F7 was more of a basin shape (Figure 23). The feature fill of all three was charcoal-enriched silty sand. The fill was collected for flotation and macrofloral analysis. The flotation yielded no charred or uncharred remains, and minimal to no charcoal. The results are described in more detail in Chapter 7.

Table 30. Summary of possible postmold features

Feature No.	Activity Area	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm) N-S	E-W	Depth	Oxidation?	Artifacts?
1	H17AA	postmold	147-148N 199E	195	31	20	11	no	bone (16)
6	H17AA	postmold	147N 198E	190	34	11	14	no	bone (3)
7	H17AA	postmold	147N 198E	199	16	14	14	no	bone (1)

Basin-shaped Hearths

Twelve basin-shaped features were discovered within the perimeters of the three basin houses. Most were discovered in pairs in the floors of the houses and tended to be located on the upslope sides around the central portion. Four basin hearths (F2, F3, F4, F5) were located in F17, four (F8, F9, F12, F13) were located within F18, three basin hearths (F10, F11, F14) were internal to F15, and one feature (F16) was discovered within the "anteroom" associated with F15 (Table 31). Fill from the features was collected for macrofloral analysis, described more fully in the next chapter. Small amounts of charred Cheno-Am seeds (N=14) were recovered from only two features, F2

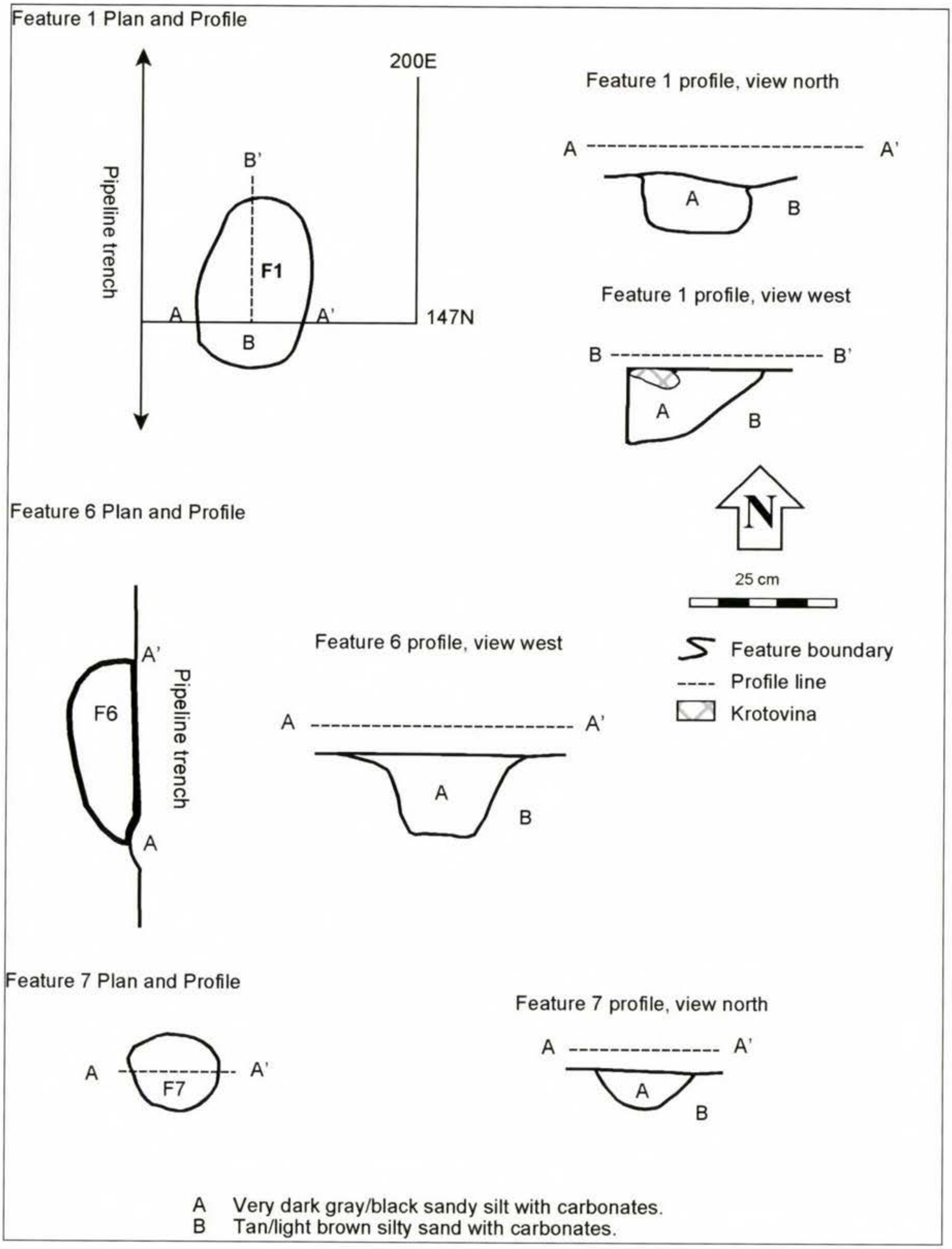


Figure 23. Plans and profiles of possible postmolds, F1, F6, F7

and F3. While Cheno-Am seeds were also recovered from seven other pit features, none of these seeds were charred, indicating they are not archaeological and likely represent modern intrusions. One uncharred Poaceae (grass) seed was recovered from F2, however, this is also probably intrusive and not representative of archaeological economic use.

Table 31. Summary of basin hearth features

Feature No.	Activity Area	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm) N-S	E-W	Depth	Oxidation?	Artifacts?	Comments
2	H17AA	basin hearth	147N 199-200E	200	70	60	6	no	debitage (2) bone (29)	shallow basin
3	H17AA	basin hearth	146N 199E	197	58	18	28	no	debitage (2) bone (56)	deep, steep-sided pit
4	H17AA	basin hearth	146N 199-200E	190	57	57	24	no	bone (57)	deep, steep-sided pit, charcoal sample for dating
5	H17AA	basin hearth	147N 199E	200	28	8*	16+	no	none	deep, steep-sided pit
8	H18AA	basin hearth	142N 203E	177	55	57	33	no	debitage (5) bone (66)	deep, steep-sided pit
9	H18AA	basin hearth	141N 203E	155	42	43	4	no	bone (24)	shallow basin
10	H15AA	basin hearth	146-147N 205-206E	160	75	66+	40	no	bone (38)	deep, steep-sided pit, charcoal sample for dating
11	H15AA	basin hearth	146N 206E	160	35+	35+	12+	no	bone (32)	shallow basin
12	H18AA	basin hearth	141-142N 204E	161	64	54	16	no	debitage (3) bone (37)	deep, steep-sided pit, slightly bell-shaped on north side
13	H18AA	basin hearth	141-142N 203-204E	162	52*	53*	19	no	debitage (9) bone (25)	deep, steep-sided pit, charcoal sample for dating
14	H15AA	basin hearth	147N 204-205E	171	66	66	26	yes	debitage (1) bone (39)	deep, steep-sided pit
16	H15AAA	basin hearth	145N 205-206E	161	70	77	44*	no	debitage (4) bone (65)	deep, steep-sided pit

+ = incomplete measurement; * = presumed measurement

Nine of the features were relatively large (>50 cm diam.), steep-sided basins, likely representing hearths (Figure 24). Fill for all was a dark brown/black to black sandy loam heavily laden with charcoal. Few rocks or charred seeds were recovered from any of the features, which indicate they were not used as storage. A higher concentration of charcoal was noted along the outer perimeter of F8. Charcoal samples from four features (F4, F10, F13, F16) were submitted for AMS radiocarbon analysis (see Table 4). F4 was located near the center of F17, F10 was located near the northeastern wall of F15, F13 was located near the center of F18, and F16 was located near the northwestern wall of the "anteroom". Most of the features were easily defined, once the base of the houses were achieved, although they were disturbed to varying degrees by burrowing animals or the erosional channel in F18.

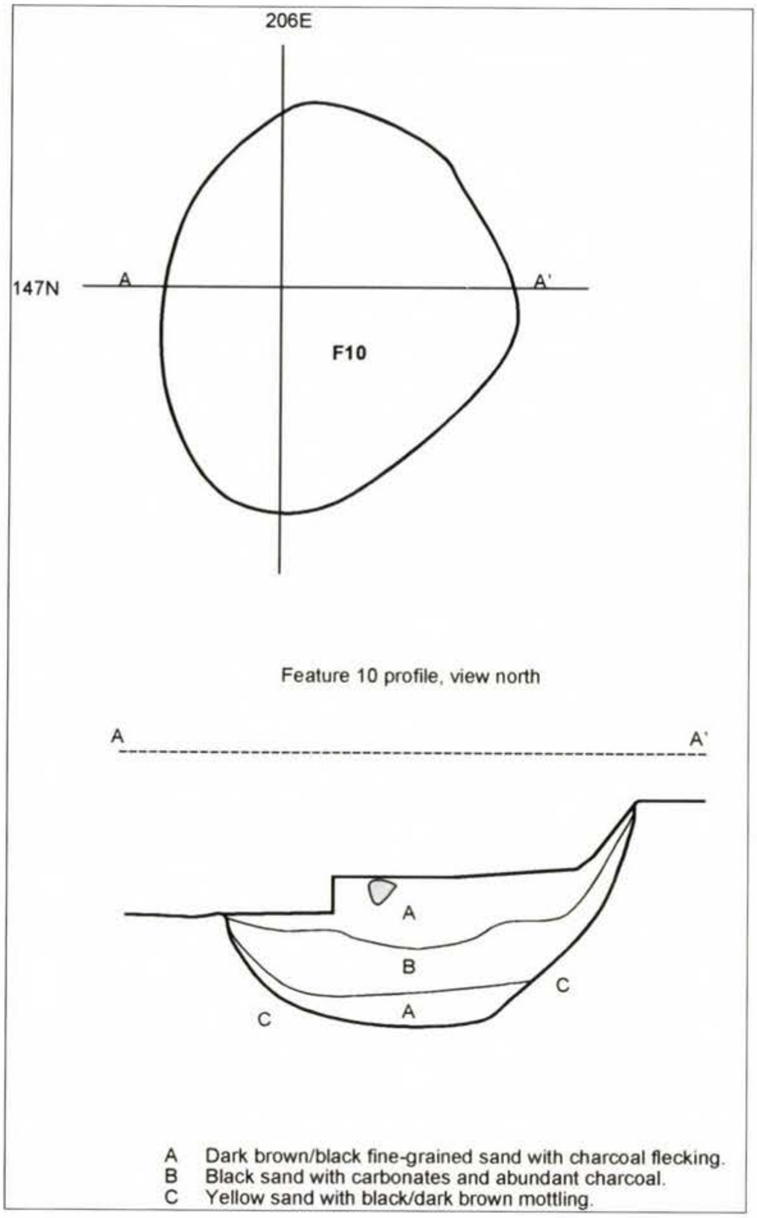


Figure 24. Plan and profile of deep hearth pit, F10

F3 and F5 were portions of two basin pit features located near the presumed center of F17. F3 included the eastern half of a basin pit that was partially dug into the western edge of F4 and presumably post-dated it. F5 was just the outer edge of a basin pit. Based on the morphology of the more complete basin pits present in F17 and the arc of the remaining portion of F5, it was likely nearly identical in morphology and size to F4. These two features (F3, F5) were mostly destroyed by the pipeline trench.

The locations of F3 and F4 relative to each other indicate reuse of F17. F4 was a complete basin hearth located near the southeastern wall of the house. F3 was also a basin hearth more centrally located. This feature lay immediately adjacent to F4, with less than 1 cm separating the walls of the two features. F4 was apparently utilized first, then F3 was used during a subsequent occupation of the house.

F8 was located on the southern edge of the drainage channel that cut through F18. In fact, approximately half of the feature was removed by the channel, with large portions of the remainder heavily impacted by rodent activity. The southern rim of the feature was easily defined, however, the north edge was much more difficult to discern and was determined more from the arc of the intact portion and the presence of undisturbed feature fill.

F12 and F13 were deep pits that had also been highly disturbed by rodent activity. The boundaries of these two features were, however, easily defined. The features were adjacent to each other, with about 10 cm separating the two. F8 was located about 35 cm to the northwest. F12 and F13 were not impacted by the prehistoric drainage channel.

F16 was a heavily disturbed pit located in the northeastern portion of the "anteroom" near the entrance to F15. The feature was so disturbed by rodent activity that its boundaries were defined based on the presence of undisturbed feature fill and the arc of the undisturbed north side. The entire south half appeared to have been removed by the activity of a large burrowing animal, possibly a badger. Undisturbed portions of the fill were collected for macrofloral analysis and yielded neither macrofloral remains nor charcoal.

Three features (F2, F9, F11) were shallow, basin-shaped pits, approximately 10 cm deep or less, and two of them (F9, F11) were difficult to identify. F2 was a wide, shallow basin located in the eastern portion of F17 (Figure 25). Three ground stone artifacts (Cat. No. 35, 66, 299) were found either directly above the feature or near the identified top of the feature. F9 was located on a slight slope near the southern perimeter of F18. One utilized flake was point plotted and removed from near the center of the feature. F11 was a small, amorphous stain located near the southeastern wall of F15, next to and east of the presumed entrance of the house. These shallow features are more reminiscent of expedient hearths, which are defined as simple stains or shallow basins. It is possible these shallow features represent firepits whose primary function was as a light source. As will be noted in the next chapter in the faunal section, there was a preponderance of cottontail bone recovered from F9, which represents the highest concentration of bone from F18. This feature may have served as an interior refuse pit, although it could also have been a location where a cottontail rabbit was processed and cooked. This same pattern was noted around F2 within F17, with the highest concentration of bone around F2. Likewise, debitage within F17 was concentrated around F2. If this shallow feature functioned as a light source, it is possible that the majority of activities that would require good light, such as tool maintenance, would occur near the source of illumination.

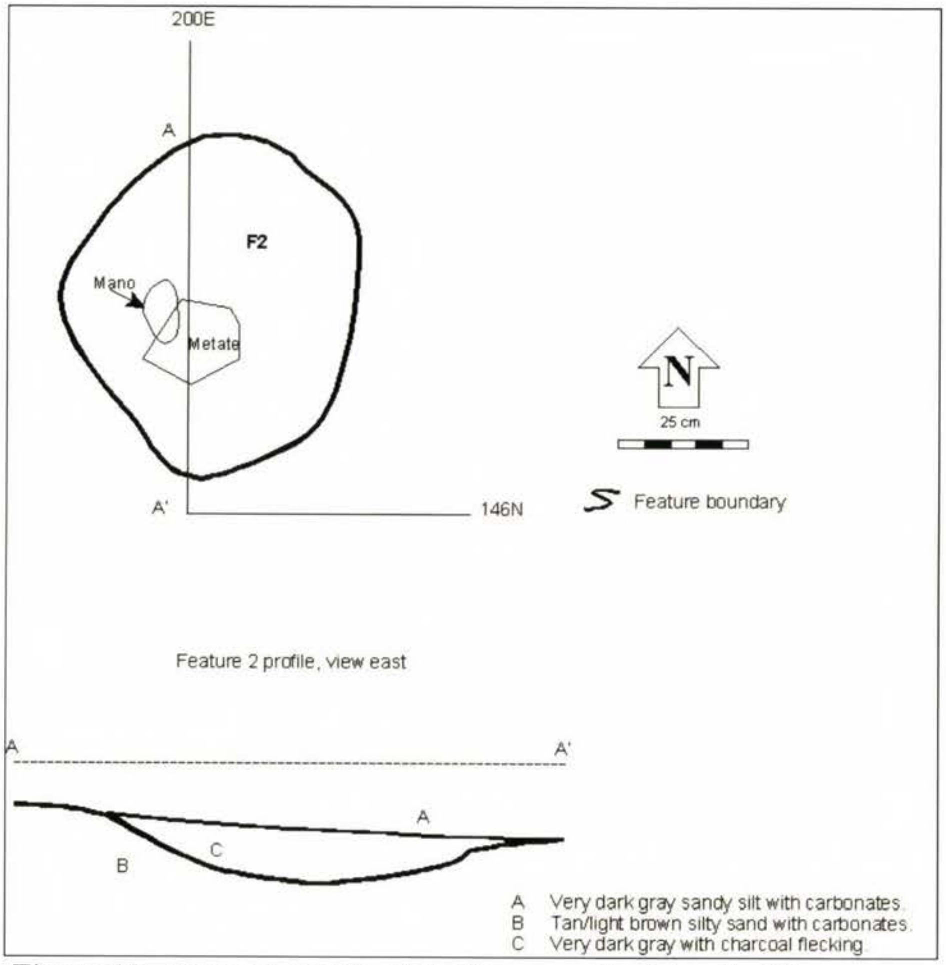


Figure 25. Plan and profile of shallow, expedient hearth, F2

SUMMARY

The excavations at site 5MF6255 resulted in the recovery of a limited, albeit diverse, artifact assemblage. This includes 777 pieces of lithic debitage, 3 hafted bifaces, 5 unhafted bifaces, 26 flakes tools, one core, two tested cobbles, 32 manos and mano fragments, 20 metates and metate fragments, four indeterminate ground stone, one hammer stone, nine small round stones, two lightly polished stones, and eight manuports, as well as one small piece of burned clay. The debitage is dominated by small flakes suggestive of tool maintenance with limited core reduction, noted by the lack of cortical flakes. The dominant material type is Morgan-Madison chert and Bridger chert variants, both of which are available from a source less than 15 km to the south. The chipped stone tool assemblage was dominated by heavily used flake tools, with few patterned bifaces present. Those that are present were lightly used. It is possible that these early stage bifaces served as sources of raw material as well as cutting implements. The edge angles of all of the flake tools and unhafted bifaces indicate their primary purpose was for cutting, although five of the flake tools also had small gravers present. No scrapers or edges that could be interpreted as scrapers were recovered. The hafted bifaces include two diagnostic and one minimally diagnostic tool. These bifaces are likely projectile points, particularly Cat. No. 48, the only nearly complete hafted biface recovered from the site. The edges of this artifact did not exhibit any use wear, and the blade was symmetrical, indicating it was not used as a knife, but probably represented a projectile point. There was not enough of the blade of the second diagnostic hafted biface (Cat. No. 284) to determine if it had been used as a knife. The third hafted biface consisted only of the base. Similar to the debitage, all of the chipped stone tools were made of Morgan-Madison or Bridger chert.

The ground stone tool assemblage comprises the largest portion of the tool assemblage at this site (62%). Manos are more common than metates and were generally more lightly used than were the metates. Fragments from both classes dominated the milling stone assemblage, and the majority of milling implements were burned. Likewise, a few of the manos had been reused as hammer stones, with nine exhibiting battering at one or both ends.

The small, round rocks were interesting because they may represent domestic items. While the crew did speculate that these stones could represent either bola stones or sling shots, it is also possible that they were game pieces or tension controllers on drums. If they do represent either of the latter two artifact types, they provide a rare glimpse into activities that do not leave traces in the archaeological record.

In addition to the artifacts, 18 features were discovered representing residential structures as well as processing pits, possible support for the structures, and potentially light sources within each house. The houses were all small and confined to a fairly small area. They appeared to be well-made in one event rather than as a result of multiple revisits and cleaning episodes (e.g., Shields 1998). One (F18) had been impacted in prehistory by a drainage channel, and no smaller pit features were found outside the perimeters of the houses. The pit features were all simple, with very little FCR recovered from any of them. Most were deep, exhibiting a somewhat rounded profile, although three were shallow basins and may have served as sources of light, as refuse pits, or as processing centers for animal and plant resources. In addition, three pits were small diameter and shallow, reminiscent of postmolds, and located near the perimeter of F17. Whether these features represented support posts for a superstructure or posts for a drying rack is unknown.

While the numbers of interior features were highest in F17, suggesting it was revisited at least once and was probably the most intensely utilized, the artifact distributions concentrate in F18, with the highest quantities of both debitage and ground stone tools present here. In addition, the only core and only dedicated hammer stone were also found in this house.

This chapter has described the artifacts recovered from excavation, as well as the features discovered. The next chapter will discuss the results of the faunal analysis and the ancillary studies.

CHAPTER 7: RESULTS OF FAUNAL ANALYSIS AND ANCILLARY STUDIES

INTRODUCTION

This chapter described the results of the analysis of the archaeofauna, conducted by Jennifer Borresen Lee of MAC, as well as the results of the ancillary studies including macrofloral, pollen, and lipid and fatty acid residues. These sections are summaries of the reports included in the appendices, with interpretations provided by myself.

The faunal assemblage represents the largest data set from 5MF6255, comprising 90.6% of all individual items recovered. For the most part, the assemblage is highly fragmentary, with more than half of the assemblage too small to identify to either taxon or body size class. Only those specimens that were identifiable were included in the analysis, as is explained in the section below and in the methods chapter (Chapter 4). Understanding the faunal assemblage helps to answer questions of subsistence and site function. Depending on the elements present, faunal assemblages can be utilized to answer questions about season of occupation as well. As will be discussed below, few animals of economic importance are present in the faunal assemblage, despite the size of the assemblage. This information can aid in assumptions of group size and length of individual occupations.

The following sections described the results of the analysis of the macrobotanical remains yielded by the flotation of feature fill. A sample from every feature discovered was submitted for flotation. Macrofloral studies of the fill from features can provide data about what plants were processed within the feature. Other remains from feature fill include lithic debitage and bone, as well as charcoal. Bone from features is included in the faunal analysis, but their presence in the features helps to detail feature function. Charcoal was identified when possible, which provides information about material used for fuel. This can provide some details about the environment and how it may be different or similar to that of the present.

Several ground stone artifacts were selected for pollen wash analysis. This type of analysis cleans the milled surface of the implement, freeing any pollen grains that may have become trapped in the pores of the rock. These pollen grains can then be identified. The assumption is that these pollen grains reflect economic usage of plants that were milled on the implements. In the pollen analysis section of this chapter, I provide a summary of the findings of John Jones, pollen analyst at Washington State University. The results of the analysis indicate which plants may have been processed by the occupants of 5MF6255.

The last section of this chapter summarizes the results of lipid and fatty acid residue analysis. Fatty acids in foods are deposited on rocks in features during cooking or processing. These residues are identifiable to types of foods, such as meats or high-fat content seeds and/or nuts. Two pieces of FCR were collected from 5MF6255, the only two rocks that were suitable for this type of analysis. The results of this analysis can provide evidence of what types of foods were cooked or processed in the features, leading to interpretations of feature function.

RESULTS OF FAUNAL ANALYSIS

The faunal section is based on the analysis of Jennie Borresen Lee. Her full report is included in this volume as Appendix H. The interpretations are my own, informed by conversations with Ms. Borresen Lee.

The archaeofauna of 5MF6255 is comprised of 8,618 bone specimens that weigh a total of 655.9 g. Included in the analysis were 3,547 specimens. These were diagnostic to skeletal element or taxa, or they were SG-3 or larger. The remaining bone was counted, size graded, weighed, and inspected for burning. The remains of a minimum of 5 cottontails, 12 jackrabbits, 1 chipmunk, 3 ground squirrels, 1 prairie dog, 11 pocket gophers, 1 pocket mouse, 1 deer mouse, 1 woodrat, and 3 voles were identified. In addition, one probable pronghorn astragalus and a tibia shaft fragment of an unidentified artiodactyl, as well as specimens consistent with all mammal body size classes were also identified (Table 32). The faunal assemblage is dominated by small fragments, SG-3 and smaller (Table 33). All of the identified archaeofauna in the assemblage are present in the environment today.

Small mammal remains are dominated by leporids, both cottontail (*Sylvilagus* sp.) and jackrabbit (*Lepus* sp.). The minimum number of individuals (MNI) of cottontails is based on the left astragali, and the MNI of jackrabbits is based on left humerii (Lee 2009). The entire forelimbs of jackrabbits are present at the site in comparable numbers (Table 34). The skeletal elements of the upper forelimb include the scapula, humerus, radius, and ulna, and their presence may represent individual carcasses.

Table 32. Site wide taxonomic diversity, including NISP values, for the floors at 5MF6255

Taxon	Common Name	Site NISP*	Site MNI	F15AA	F17AA	F18AA	F15AAA
Family Leporidae	rabbits, hares	24	-	3	9	6	-
Sylvilagus sp.	cottontail	45	5	5	5	11	2
Lepus sp.	jackrabbit	299	12	19	43	51	13
Order Rodentia	rodents	61	-	4	-	22	3
Eutamias sp.	chipmunk	1	1	-	-	-	-
Spermophilus sp.	ground squirrel	22	3	-	-	10	4
Cynomys sp.	prairie dog	1	1	-	-	1	-
Thomomys talpoides	Northern pocket gopher	102	16	1	-	27	4
Perognathus sp.	pocket mouse	2	1	-	-	-	-
Family Cricetidae	mice, rats, lemmings, voles	7	-	2	-	2	-
Peromyscus sp.	deer mouse	1	1	-	-	-	-
Neotoma sp.	woodrat	2	1	-	-	-	-
Microtus sp.	vole	11	3	-	-	-	-
Order Artiodactyla	even-toed ungulates	1	-	-	-	-	-
cf. *Antilocapra americana*	pronghorn	1	1	-	-	-	-
mammal, BSC I	mouse/squirrel/rabbit-sized	2418	-	155	307	303	67
mammal, BSC II	coyote/badger/pronghorn-sized	1	-	-	-	-	-
mammal, BSC II/III	coyote/pronghorn/deer-sized	19	-	2	-	-	5
mammal, BSC III	deer/pronghorn-sized	22	-	-	-	1	6
mammal, BSC III/IV	deer/bison-sized	2	-	-	-	-	-
mammal, BSC IV	bison-sized	1	-	-	-	-	-
unidentified mammal		500	-	99	170	30	-
unidentified		4	-	-	-	1	-
	TOTAL	3547	45	290	534	465	104

*NISP does not include non-diagnostic SG4 bone.

Note: rather than NISP values, the counts for the six mammal BSCs, unidentified mammal, and unidentified categories more appropriately reflect NSP (number of specimens) values (Lyman 2008). They are included in this table to provide a quick reference about the nature of the archaeofauna as a whole.

Table 33. Faunal size grade data, 5MF6255

SG	Count	%count	Weight (g)	%weight
1	5	0.1%	29.4	4.5%
2	96	1.1%	89.0	13.6%
3	2023	23.5%	317.6	48.4%
4	6494	75.4%	219.9	33.5%
TOTAL	8618	100.0%	655.9	100.0%

Jackrabbit remains were recovered from the entire site. The remains were concentrated within each house, particularly around Features 9, 12, and 13 in F18, and Features 2, 3, and 4 in F17 (Figure 26). Burned jackrabbit bone reflects this distribution pattern (Figure 27), suggesting these locations were probably areas in which the rabbits were processed. Cottontail remains were more localized, with concentrations around the same features as jackrabbits, for both burned and unburned specimens (Figure 28 and Figure 29). Interestingly, few remains were recovered from either F15 or the F15 anteroom. Lee noted a high proportion of jackrabbit remains from the F17 and F18 contexts consisted of limb bone ends rather than shafts (Lee 2009). A likely interpretation of this preponderance of limb bone ends is that they were roasted over a fire and represent cultural use of the carcasses (Hockett and Bicho 2000).

Additional rodent remains include chipmunk, ground squirrel, prairie dog, pocket gopher, pocket mouse, deer mouse, woodrat, and vole. The majority of these remains were not coated with calcium carbonates similar to the burned and unburned leporid bones, they were not burned, and the skeletal elements present were dominated by cranial and/or mandibular specimens. Chipmunk, prairie dog, and deer mouse are represented

Table 34. Jackrabbit (Lepus sp.) skeletal element abundance, 5MF6255

	Element	Code	NISP	Left	Right	n	MNE	MAU	%MAU
Cran-ial	Crania	CRN	22	1	2	0	3	1.5	12.0%
	Mandible	MR	11	1	4	1	6	3.0	24.0%
Axial	Atlas	AT	0	-	-	-	0	0.0	0.0%
	Axis	AX	0	-	-	0	0	0.0	0.0%
	Cervical Vertebra	CE	0	-	-	0	0	0.0	0.0%
	Thoracic Vertebra	TH	0	-	-	0	0	0.0	0.0%
	Rib	RB	13	5	1	0	6	0.2	1.7%
	Lumbar Vertebra	LM	0	-	-	0	0	0.0	0.0%
	Sacrum	SA	0	-	-	0	0	0.0	0.0%
Appedicular	Scapula	SC	19	4	5	1	10	5.0	40.0%
	Humerus	HM	38	12	10	3	25	12.5	100.0%
	Radius	RD	29	9	10	1	20	10.0	80.0%
	Ulna	UL	32	11	10	1	22	11.0	88.0%
	Metacarpal I	MCI	0	0	0	0	0	0.0	0.0%
	Metacarpal II	MCII	0	0	0	0	0	0.0	0.0%
	Metacarpal III	MCIII	0	0	0	0	0	0.0	0.0%
	Metacarpal IV	MCIV	1	0	1	0	1	0.5	4.0%
	Metacarpal V	MCV	0	0	0	0	0	0.0	0.0%
	Innominate	IM	5	2	3	0	5	2.5	20.0%
	Femur	FM	32	2	1	5	8	4.0	32.0%
	Patella	PT	1	0	1	0	1	0.5	4.0%
	Tibia	TA	47	7	8	1	16	8.0	64.0%
	Fibula	FIB	1	0	0	1	1	0.5	4.0%
	Astragalus	AS	10	7	3	0	10	5.0	40.0%
	Lateral Malleolus	LTM	0	0	0	0	0	0.0	0.0%
	Calcaneus	CL	13	5	4	0	9	4.5	36.0%
	Metatarsal I	MTI	0	0	0	0	0	0.0	0.0%
	Metatarsal II	MTII	3	2	1	0	3	1.5	12.0%
	Metatarsal III	MTIII	3	1	2	0	3	1.5	12.0%
	Metatarsal IV	MTIV	2	1	1	0	2	1.0	8.0%
	Metatarsal V	MTV	0	0	0	0	0	0.0	0.0%
	Phalanx 1	PHF	2	0	0	1	1	0.1	1.0%
	Phalanx 2	PHS	0	0	0	0	0	0.0	0.0%
	Phalanx 3	PHT	2	0	0	1	1	0.1	1.0%
	TOTAL (ID bone)		286						
	Indeter. Vertebra	VT	1						
	Indeter. Carpal	CP	1						
	Indeter. Metacarpal	MC	2						
	Indeter. Tarsal	TR	3						
	Indeter. Metatarsal	MT	1						
	Indeter. Metapodial	MP	3						
	Indeter. Phalanx	PH	2						
	TOTAL (all bone)		299						

Note: Cranial left and right values are based on element portions that occur on both sides of the skull or mandible (e.g., zygomatic, maxilla, individual teeth).

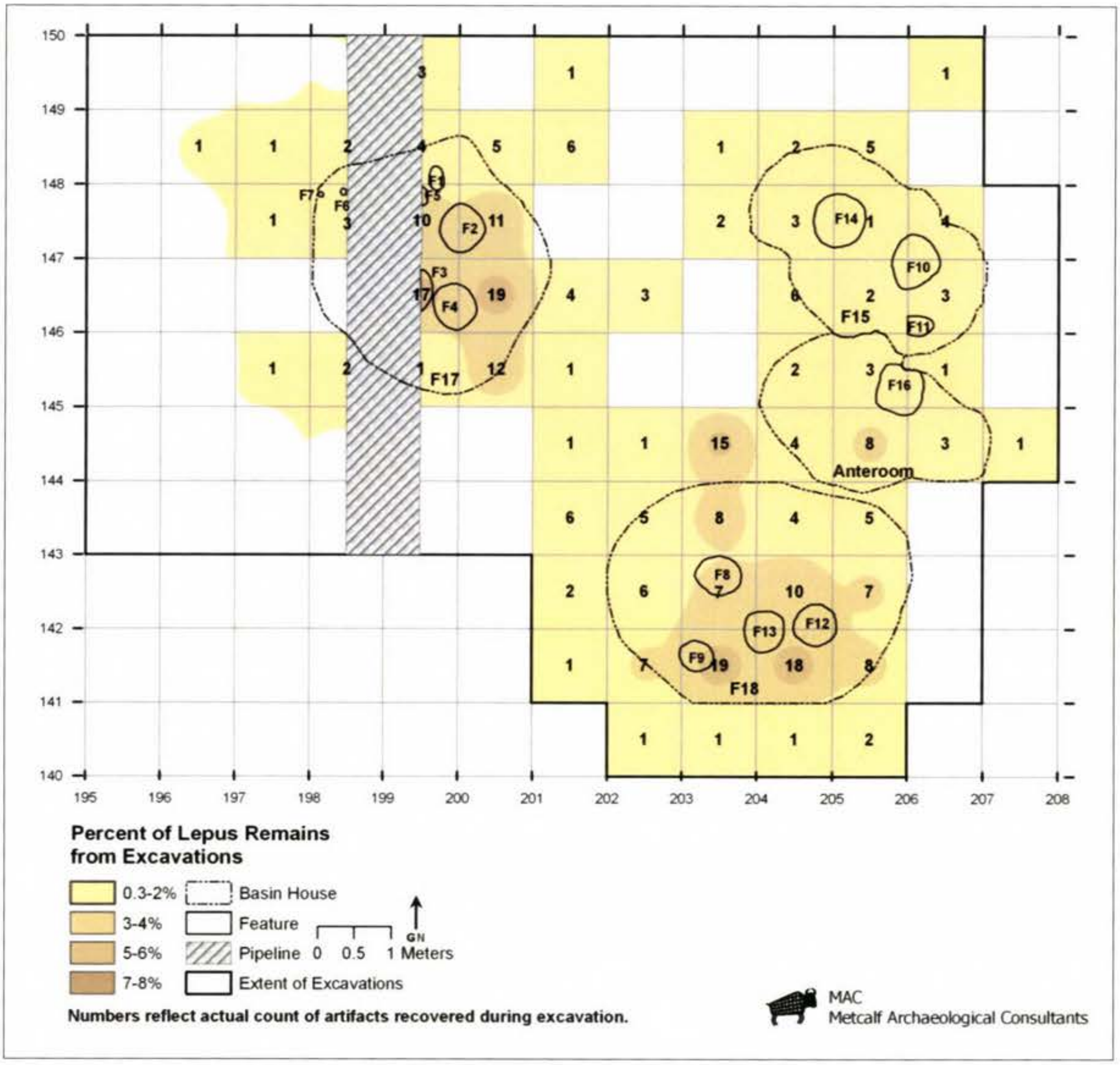


Figure 26. All jackrabbit (*Lepus* sp.) bone distribution

solely by post-cranial elements. These remains are considered intrusive to the assemblage and not representative of cultural use.

The remains of pocket gophers (*Thomomys talpoides*) indicate a MNI of 11, the majority of which were recovered from the southeastern portion of the block, specifically in and above F18, but were also found from around the anteroom and small quantities from F15 (Figure 30). There were no clusters of elements suggestive of individual bodies, although the remains do cluster around the features in F18 and along the northern

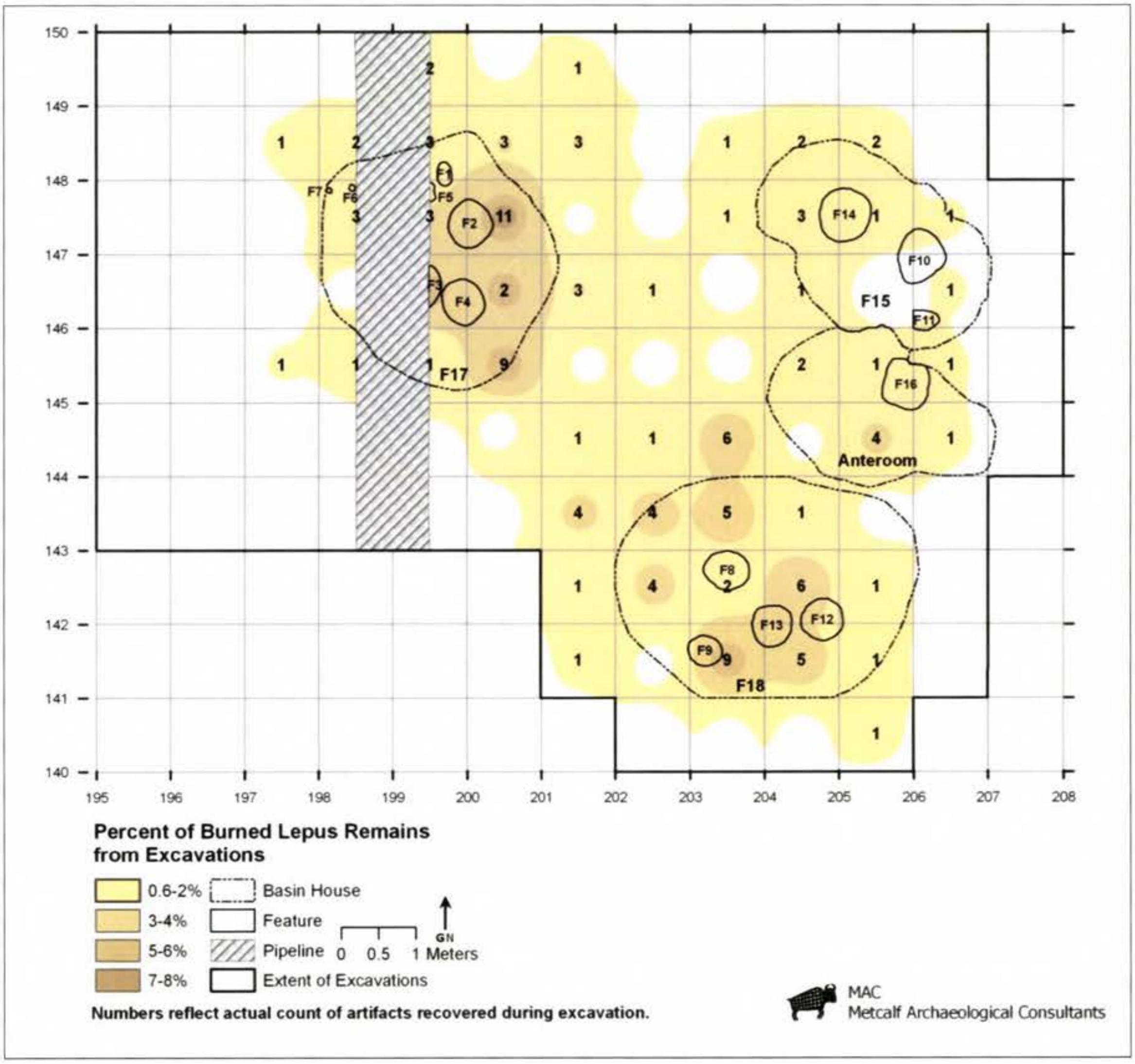


Figure 27. All burned jackrabbit (*Lepus* sp.) bone distribution

edge of this house. None of the specimens were burned. Their location near the interior pit features and the composition of skeletal elements present is suggestive of human use. Shaffer (1992) suggests that culturally derived gopher assemblages would contain a preponderance of cranial elements, possibly as a result of removal of the heads prior to consumption. Cranial elements dominate the gopher assemblage at 5MF6255 (Table 35), however, the sampling technique employed by screening the soil matrix through 1/4" mesh indicates that the elements recovered through this technique should reflect the

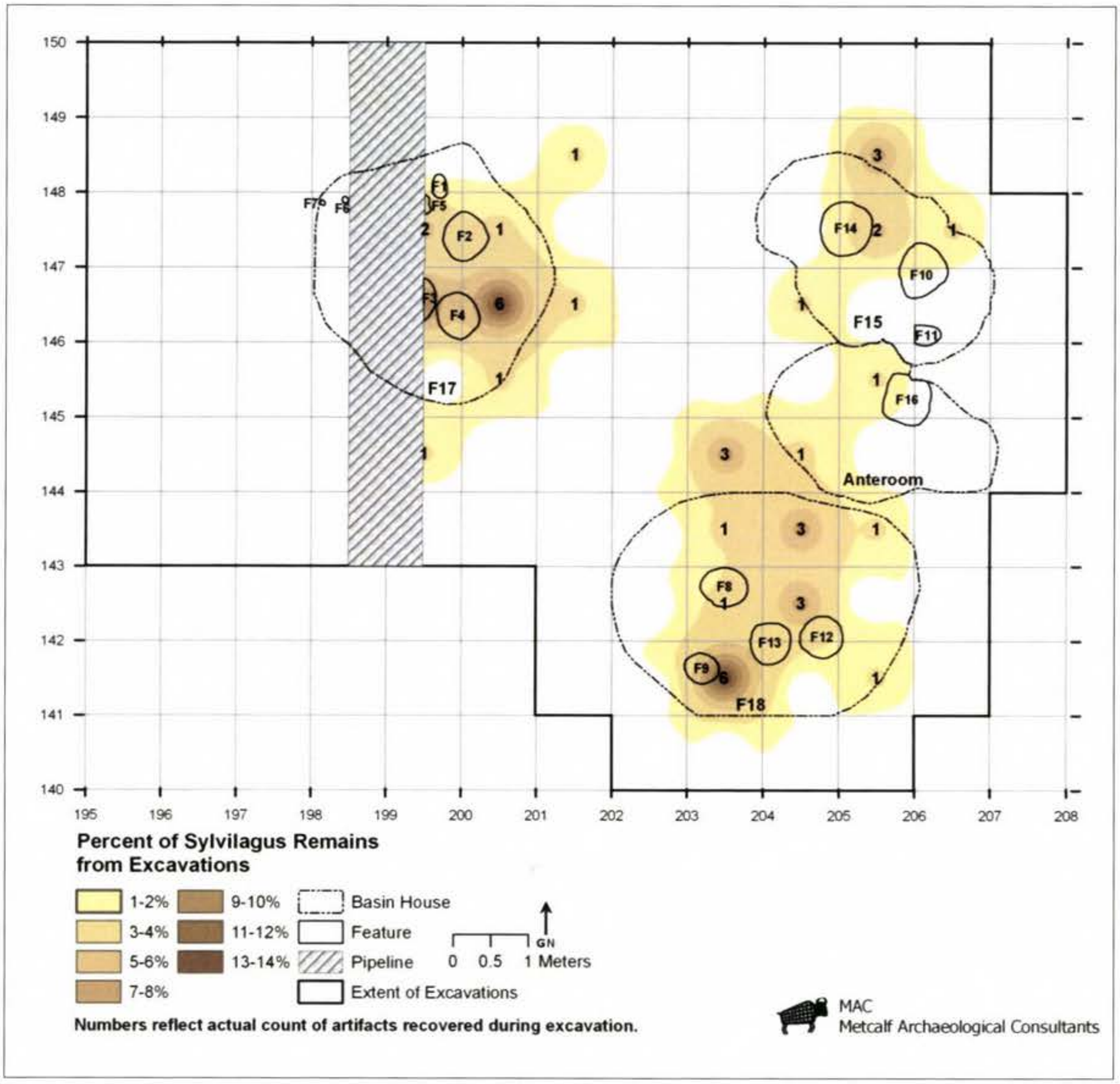


Figure 28. All cottontail (*Sylvilagus* sp.) bone distribution

ratios that were recovered from 5MF6255 as intrusive. The lack of burning supports this hypothesis, as well as the distributions of the remains. This area of the site was heavily impacted by rodent activity, and the concentration along the northern edge of F18 coincides with the prehistoric drainage that impacted the house.

Several specimens included in the medium mammal body size class, including at least one probable pronghorn astragalus and a spirally fractured tibia shaft fragment from

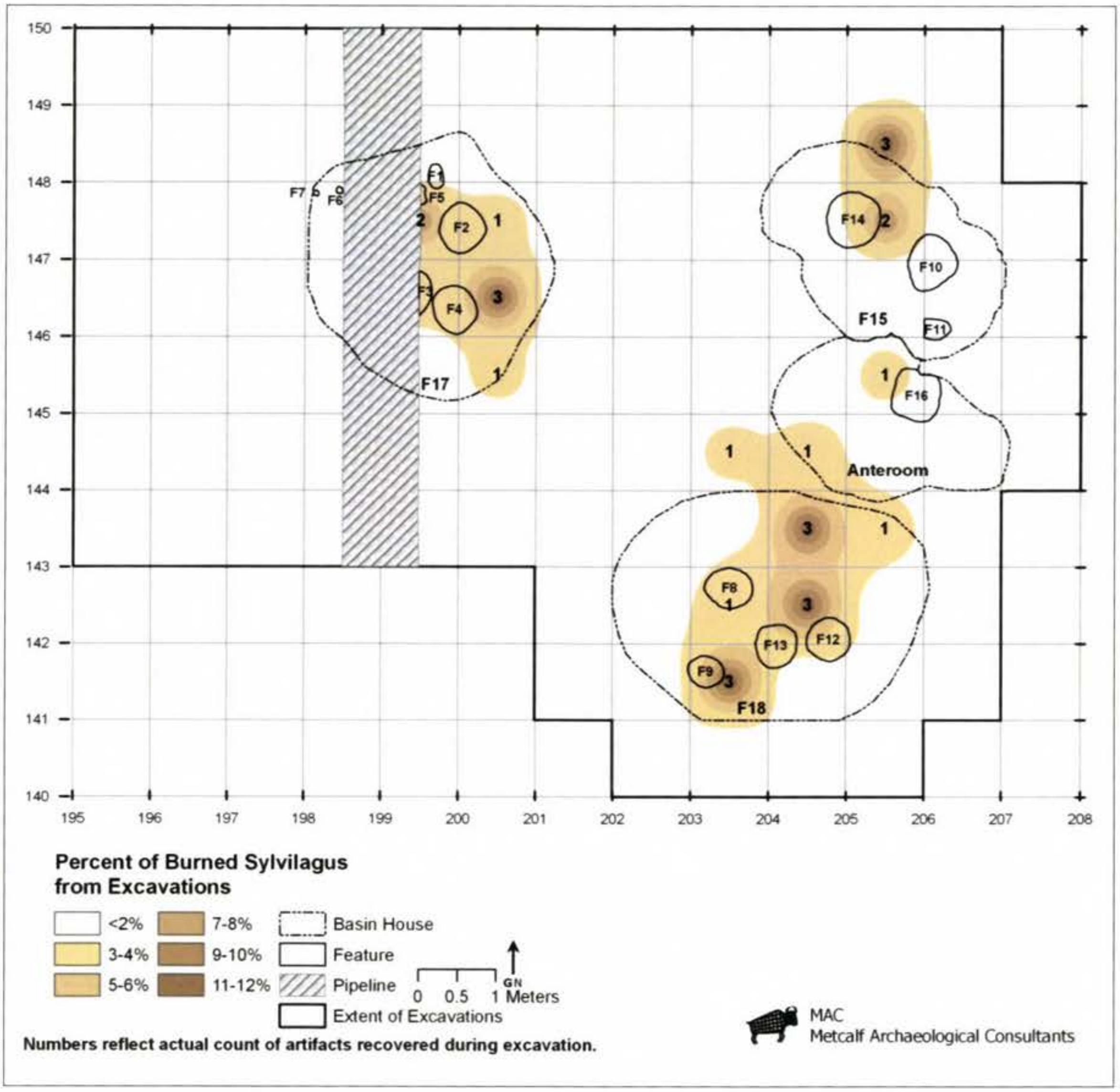


Figure 29. All burned cottontail (*Sylvilagus* sp.) bone distribution

an unidentified artiodactyl were also recovered. The shaft fragments concentrate in F18, suggesting at least one pronghorn/deer was butchered in this area.

Nearly half (48%) of the assemblage was burned, the majority of which are unidentified small mammal (75%). Leporid bones are the only positively identified remains that were burned, with the exception of one woodrat tooth and three rodent specimens. The distribution of burned bone reflects the distributions of leporid bones (Figure 33), suggesting the majority of unidentified burned bone is leporid. Carbonate

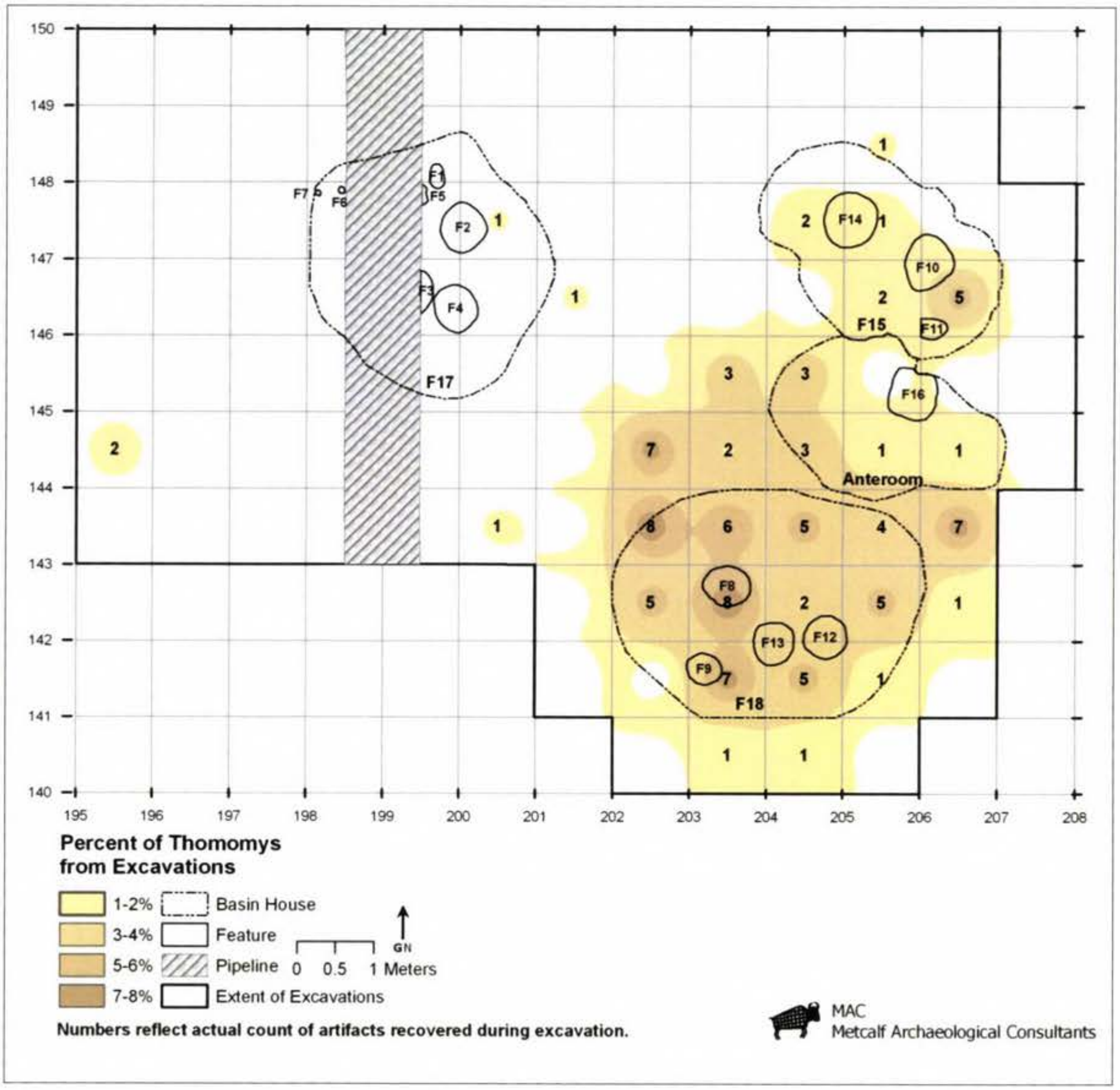


Figure 30. Northern pocket gopher (*Thomomys talpoides*) bone distribution

deposits are common on the rabbit bones, while much of the other rodent remains are free of this precipitate, indicating the rabbit bones are associated with the cultural deposits and the rodent remains are likely intrusive.

In addition to the faunal assemblage was one modified bone artifact (Cat. No. 454) collected from the screen. The artifact is a patterned bone awl recovered from the floor of the anteroom (Figure 31). It is made on a long bone shaft fragment of a medium or large mammal. It measures 12.4 cm long by 1.0 cm wide by 0.9 cm thick. It is very

Table 35. Skeletal elements of the pocket gopher assemblage at 5MF6255

Element	Count
Cranial	
Mandible	38
Cranium	26
Indeterminate molar	3
Total	**67**
Post-Cranial	
Humerus	5
Scapula	4
Femur	5
Tibia	9
Innominate	7
Ulna	2
Radius	2
Unidentified	1
Total	**35**

fragile and thickly encrusted with carbonates on all surfaces, masking any modification or use wear. The awl was broken in to seven pieces during excavation activities, although it appears to have been broken in three pieces sometime in antiquity. This fragmentation may have been the reason the tool was discarded, or it may have been lost and broken post-occupation. There are fracture surfaces that have carbonate accumulations indicative of the tool's fragmentation prior to its discovery. These accumulations are not as thick as those present on the outer surfaces of the tool, suggesting it may have been complete for some time after it was lost. On the other hand, the density of carbonates on the broken surfaces may be a product of the character of the surface. Perhaps carbonates accumulate more slowly on broken surfaces, or the fragments may have been in tight proximity, inhibiting the development of carbonates on these surfaces. The tip of the tool is also void of carbonate residues, possibly as a result of the smoothing and polishing required to create the tapered end.

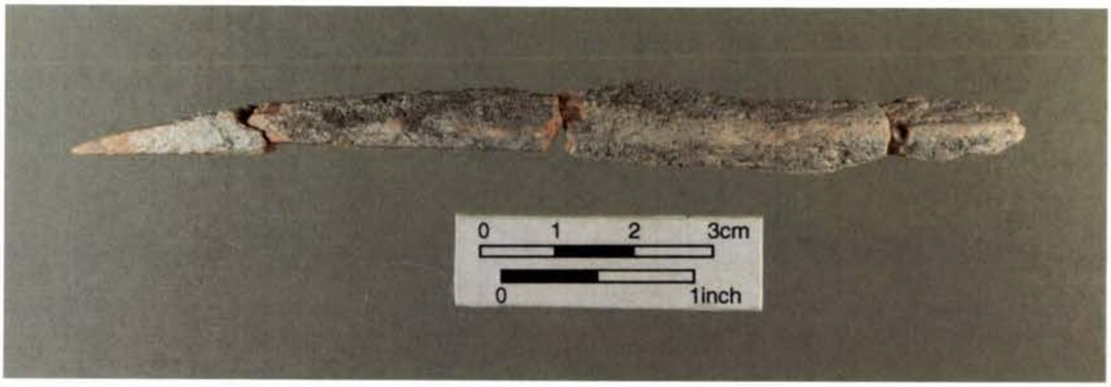


Figure 31. Bone awl (Cat. No. 2009.013.454

MACROFLORAL ANALYSIS

Twenty flotation samples were analyzed from 5MF6255. These included fill from the interior features of the three houses (F15, F17, F18), as well as two general fill samples (Table 36).

Two samples, one each from F2 and F3, contained charred Cheno-Am (*Chenopodium/Amaranthus*) seeds, and six samples contained sagebrush (*Artemisia* sp.) charcoal. Fill from F2 also contained one uncharred grass seed. According to ethnographic evidence, Cheno-Am seeds were stored, ground, and used for flour or meal (Buskirk 1986; Castetter and Opler 1936; Chamberlin 1974; Colton 1974; Elmore 1944; Vestal 1952). Sagebrush wood was used by southwestern tribes for fuel, construction and ritual materials, and medicine (Bye 1972; Chamberlin 1974; Elmore 1944; Robbins et al. 1916; Whiting 1985). Sagebrush was the primary fuelwood at the site. Table 37 lists charred propagules, plant parts, and wood recovered from 5MF6255 (Bollans 2009:5). Uncharred seeds are considered intrusive and not archaeological.

The results of the flotation and macrofloral analysis were minimal, with only a handful of charred Cheno-Am seeds recovered. These are the only seeds that are

Table 36. Results of Flotation

Feature No./ Provenience	Depth (cmbd)	Macrofloral Taxa	Propagule and Plant Parts	Condition	Charcoal Identification	Weight (g)
1	195-206	*Chenopodium/Amaranthus*	1	uncharred	None	
2; E½	200-207	*Chenopodium/Amaranthus*	4	charred	*Artemisia*	<0.1
2; W½	200-207	Poaceae	1	uncharred	None	
3	197-225	*Chenopodium/Amaranthus*	10	charred	Too small	
4	197-214	*Chenopodium/Amaranthus*	1	uncharred	None	
5	200-216	None			Too small	
6	190-204	None			Too small	
7	190-200	None			Too small	
8		*Chenopodium/Amaranthus*	2	uncharred	Too small	
9	155-159	None			None	
10; S ½	205-206	None			None	
10; S ½	171-177	*Chenopodium/Amaranthus*	1	uncharred	*Artemisia*	<0.1
11		*Chenopodium/Amaranthus*	2	uncharred	*Artemisia*	<0.1
12	161-171	*Chenopodium/Amaranthus*	12	uncharred	*Artemisia*	0.2
13	162-181	None			None	
14; W ½	171-197	*Chenopodium/Amaranthus*	1	uncharred	*Artemisia*	0.1
14; E ½		None			None	
16	179-184	None			None	
SE corner 146N 206E	160-175	*Chenopodium/Amaranthus*	2	uncharred	*Artemisia*	<0.1
148N 206E	140-150	None			Too small	

considered archaeological and a result of the economic activity from 5MF6255. Sagebrush was identified as the dominant type of charcoal present in the features, not surprising considering the prevalence of the plant in the current environment, which was likely similar to the paleoenvironment.

Table 37. Charred macrobotanical remains (Bollans 2009:5)

Sample Context			Propagule and Plant Parts		Wood	
Sample #	Feature	Provenience	*Chenopodium/ Amaranthus*	TOTAL	*Artemisia* sp.	TOTAL
S 6	3	146N, 199E; 197-225 CMBD	10	10		10
S 57	2	147N, 200E; 200-207 CMBD	4	4	20	20
S 77	11	146N, 206E			9	9
S 79	10	146N, 205-206E; 171-177 CMBD S 1/2			20	20
S 82	12	141N, 204E;161-171 CMBD; E 1/2			12	12
S 110	14	147N, 204-205E; W 1/2, 171-197 CMBD			20	20
S 114	UNK	146N, 206E; 160-175 CMBD; SE CORNER			20	20
TOTAL			14	**14**	101	**52**

PALYNOLOGICAL ANALYSIS

Five ground stone artifacts were submitted for pollen wash analysis as well as two associated sediment control samples, for a total of seven pollen samples (Table 38). Results indicate pollen types and frequencies generally matched the background pollen rain, with the exception of grass pollen (Table 39). Ten different plant types were identified, several of which have importance as food sources.

Table 38. Description of pollen wash analysis samples

Cat. No.	MAC Sample No.	Lab Sample No.	Provenience	Description
66		33	W ½ Feature 2, 147N 199E, 190-196 cmbs	mano
299		12	Feature 2, 147N 200E, 184-189 cmbs	slab metate fragment
485		32	floor of anteroom, 145N 204E, 148-157 cmbs	metate fragment
573		13	142N/203E, 162 cmbs	slab metate
576		14	floor of Feature 18, 142N 203E, 166-171 cmbs	metate fragment
	45	49	148N 200E, 190-200 cmbs	Soil control sample
	66	21	142N 203E, 160-168 cmbs	Soil control sample

Table 39. Pollen Counts and Percentages (adapted from Table 9, Jones 2009:27-28)

Taxon	**Sample** (count/**percent**)						
	12	**13**	**14**	**21**	**32**	**33**	**49**
Non-arboreal:							
Artemisia	78/**38.6**	90/**45.0**	60/**30.0**	86/**42.8**	95/**47.5**	71/**35.5**	70/**35.0**
Asteraceae High Spine	--	--	--	1/**0.5**	--	--	1/**0.5**
Asteraceae Low Spine	43/**21.3**	47/**23.5**	41/**20.5**	39/**19.4**	45/**22.5**	25/**12.5**	36/**18.0**
Cirsium	--	1/**0.5**	--	--	--	--	--
Brassicaceae	--	--	--	--	--	1/**0.5**	--
Caryophyllaceae	--	--	--	1/**0.5**	--	--	--
Cheno-Am	28/**13.9**	22/**11.0**	26/**13.0**	32/**15.9**	27/**13.5**	60/**30.0**	51/**25.5**
Ephedra	1/**0.5**	--	1/**0.5**	1/**0.5**	1/**0.5**	--	--
Eriogonum	--	--	--	1/**0.5**	2/**1.0**	2/**1.0**	3/**1.5**
Sarcobatus-type	2/**1.0**	2/**1.0**	3/**1.5**	2/**1.0**	3/**1.5**	6/**3.0**	2/**1.0**
Platyopuntia	--	--	--	1/**0.5**	1/**0.5**	--	--
Poaceae	12/**5.9**	9/**4.5**	10/**5.0**	5/**2.5**	3/**1.5**	8/**4.0**	3/**1.5**
Polygonaceae	--	--	--	--	1/**0.5**	3/**1.5**	2/**1.0**
Polygonum	--	--	2/**1.0**	--	--	--	--
Arboreal:							
Juniperus	15/**7.4**	12/**6.0**	15/**7.5**	14/**7.0**	10/**5.0**	8/**4.0**	16/**8.0**
Picea	--	--	1/**0.5**	--	--	--	--
Pinus	13/**6.4**	8/**4.0**	34/**17.0**	6/**3.0**	7/**3.5**	6/**3.0**	9/**4.5**
Quercus	1/**0.5**	3/**1.5**	3/**1.5**	5/**2.5**	--	2/**1.0**	1/**0.5**
Salix	--	--	--	--	--	--	1/**0.5**
Sambucus	--	--	--	1/**0.5**	--	--	--
Indeterminate	9/**4.5**	6/**3.0**	4/**2.0**	6/**3.0**	5/**2.5**	8/**4.0**	5/**2.5**
TOTAL	**202/100.0**	**200/100.0**	**200/100.0**	**201/100.0**	**200/100.0**	**200/100.0**	**200/100.0**
Pollen concentration (Grains/ml of sediment)	*	*	*	**14,614**	*	*	**8432**

The following is reproduced from the pollen report provided by John Jones, pollen analyst at Washington State University:

> "A total of seven pollen samples from 5MF6255 were examined, including five pollen washes (four metates and a mano), and two associated sediment samples. Pollen counts and proveniences are presented in Table 9. Preservation was fair at this site, and concentration values ranged from 8432 to 14,614 fossil grains/ml of sediment. Preservation at this site might have been somewhat enhanced by the deep layer of overburden covering the site, somewhat mitigating the oxidizing conditions of the area.
>
> Pollen samples were dominated by the over-represented *Artemisia*, low spine Asteraceae, Cheno-Ams, Poaceae, *Juniperus* and *Pinus*. Background taxons identified in the pollen assemblages include *Ephedra*, *Sarcobatus*-type, *Picea*, *Quercus* and *Salix*. Less commonly encountered insect-pollinated types identified in the assemblages include *Cirsium* and high spine Asteraceae, Brassicaceae, Caryophyllaceae, *Eriogonum*, *Platyopuntia*, *Polygonum* and Polygonaceae, and *Sambucus*. While most of this latter group represents normal pollen flora for the region, potential economic value may be attributed to some of the taxons. Brassicaceae, *Eriogonum*, *Platyopuntia*, *Polygonum* and *Sambucus* all have appreciable economic worth, both for foods and in some cases as medicines. While none of these taxons occurs in numbers of more than a few grains per sample, it is possible that they represent the prehistoric use of these plants. *Sambucus cerulea* (elderberry) occurs in the project area (Elias 1980), and was likely to have been an important summer food in the past; however, its use or appreciation at this site is not necessarily reflected by the single grain occurrence in a sediment control sample.
>
> It is interesting that pollen from grasses occurs in higher percentages on the grinding surfaces than in the sediment control samples. Grinding surface samples averaged 4.2% grass, while the control samples contained an average of 2% grass pollen, hinting that some of the grinding surfaces might have been used to grind this important food (Jones 2009:43-44)."

The results of the pollen analysis of the wash samples from the ground stone tools indicates several types of economically important plants were present in the environment, as well as on the surfaces of these tools. The levels of pollen on the tools in relation to the control samples, however, do not provide strong evidence that these plants were utilized at 5MF6255. The similar levels suggest the pollen is present merely as a result of the ground stone being present and exposed during the pollen rain. It is interesting to note, however, that grass pollen was present in elevated levels on all ground stone tools sampled, as compared to the control samples. This suggests grass was utilized by the occupants of the site and processed with these tools.

ANALYSIS OF FATTY ACID COMPOSITIONS OF ARCHAEOLOGICAL RESIDUES

Two pieces of sandstone FCR (S-34, S-116) were submitted for lipid analysis. Both are sandstone and were submitted because they were the only two appropriate pieces of FCR for submission from excavations. S-34 was recovered from the base of the excavation in the area between Features 15 and 17. S-116 was recovered from the floor of F15 near the eastern wall, approximately 1 m east of F10. Neither sample came from a hearth. The results of the analysis for S-34 returned insufficient fatty acids for identification of the residues, and no lipid biomarkers were detected. On the other hand, S-116 returned residues typical of large herbivores. Specific isomer levels are high, indicative of the processing of either fatty meat or meat in combination with moderate to high fat-content plant products, such as seeds or nuts. Dehydroabietic acid, indicating the presence of conifer products, is also present. The source is unknown and may have been introduced from firewood, resins, or other conifer products. In addition, azelaic acid was also detected. This acid is associated with the oxidation of unsaturated fatty acids, which are most abundant in seed oil (Malainey and Figol 2009). The results of the analysis for S-116 indicates that a medium-sized mammal was processed or cooked in the feature from which the rock originated.

SUMMARY OF FAUNAL ANALYSIS AND ANCILLARY STUDIES

The results of the faunal analysis show that the assemblage is dominated by leporids, with a MNI of 17 represented including five cottontails and 12 jackrabbits. Burning is present on over half of the rabbit and rabbit-sized bone, indicative that leporids were utilized for food. Larger sized mammals, such as pronghorn and/or deer, are also represented, however, there is only a limited quantity of these elements in the assemblage. These animals were clearly exploited, but did not constitute a major portion of the subsistence at 5MF6255. The causes for this paucity of medium-sized mammals are not certain, but it may be a result of limited availability of this resource due to adverse climatic conditions. Rabbits may have been specifically targeted because of the relative ease in hunting them and the high levels of protein and fat yields per ounce, which is similar to larger game animals (Hockett and Bicho 2000:721). Rabbits are also relatively easy to process; they can be easily transported whole from kill sites and can be butchered by bending joints (Lee 2009).

The results of the macrofloral, pollen, and lipid analyses were minimal in terms of explaining what plant foods were utilized, providing only glimpses of the species used. Few seeds, either charred or uncharred, were recovered from the flotation. Uncharred seeds are typically considered intrusive to the site and not archaeological. One uncharred grass seed was recovered from F2, which also had two of the pollen-washed ground stone found immediately above it. Results from the pollen analysis indicate that grass pollen was the most common type of pollen present on the ground stone, at a frequency higher than the background pollen rain. This data combined with the presence of an uncharred grass seed suggests grasses were processed with the ground stone tools and possibly processed in or near F2. Lipid analysis is similarly limited in information, revealing that one rock had been utilized in a pit that had been used to process the fatty meat of a large herbivore, possibly a pronghorn or mule deer. On the other hand, rabbit meat is high in fat and could have been processed in the unknown feature. Ultimately, the results of these analyses show that rabbits were a focus of economic activity, as were floral resources, however, the specific plants utilized are not clear.

In the next chapter, Chapter 8, I will discuss the distributions of artifacts and faunal remains in the four activity areas identified in Chapter 5, as well as the non-floor distributions. A possible function for each activity area/basin house will be posited.

CHAPTER 8: DISCUSSION OF ACTIVITY AREAS

INTRODUCTION

Chapter 6 described the results of excavation, including the results of artifact analyses. Chapter 7described the results of the faunal analysis, as well as the results of the ancillary studies, such as macrobotanical, pollen, and lipid and fatty acid residue analyses. In this chapter, I will talk about the distributions of the artifacts within each of the houses or activity areas, and the non-floor distributions, and look at the assemblages of each activity area as a whole, rather than parts of a larger artifact class assemblage as I did in Chapters 6 and 7. The purpose is to try to understand the activities that occurred in each house and how they compare to each other. The non-floor distributions can aid in determining site formation, and if some houses were utilized as discard areas. My interpretations were formed with the aid of the archaeological literature, both general (Binford 1978, 1980; Kent 1992, 1999) and specific to basin houses in this region (Larson and Francis 1997; Metcalf and Black 1991, 1997; Reed and Metcalf 1999; Shields 1998). Terminology such as middens, trash deposits, cleaning and sweeping, come from this literature and have the same meaning.

Artifact distribution maps, created by Molly Boeka Cannon of MAC utilizing ArcGIS 9.0, included the bottom 10 cm of the floors of the basin houses (Floor Distribution) and artifacts recovered from the entire cultural fill above the house floors

(Non-Floor Distribution). These distribution maps illustrate the activity areas within the houses, as well as properties of the fill overlying the floors.

FEATURE 15 HOUSE ACTIVITY AREA (H15AA)

Description

Feature 15 was the smallest basin house located in the northeastern corner of the excavation block and encompassed an activity area. There were three features internal to this house basin, F10, F11, and F14 (Table 40). All three were identified when excavation encountered the contact with the sediments underlying the house floor, although F11 was more difficult to identify than the other two. This feature was noted slightly higher in elevation than the floor contact, near the southeastern wall of the house adjacent to the presumed entrance. It had a slightly darker, more charcoal-stained fill than the surrounding house fill sediments. F10 was located less than 1 m north of F11, slightly more central but still well to the margins of the house. F14 was northwest of F10 along the same axis as the house, also closer to the perimeter of the house than the center.

Table 40. Summary of features in H15AA

Feature No.	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts	Comments
				N-S	E-W	Depth			
10	basin hearth	146-147N 205-206E	160	75	66+	40	no	bone (38)	deep, steep-sided pit, charcoal sample for dating
11	basin hearth	146N 206E	160	35+	35+	12+	no	bone (32)	shallow basin, unknown function
14	basin hearth	147N 204-205E	171	66	66	26	yes	debitage (1) bone (39)	deep, steep-sided pit

Feature No.	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts	Comments
				N-S	E-W	Depth			
15	basin house	145-148N 203-207E	132	390	262	45	yes	flaked stone tool (1) ground stone (1) other non-chipped stone artifacts (1) debitage (28) bone (552)	

+ = incomplete measurement

Samples from each feature were collected for flotation and macrobotanical analysis. Uncharred Cheno-Am seeds were recovered from all three features (see Table 36). While goosefoot and pigweed were economically important foods, uncharred macrobotanical remains are considered to be intrusive and not indicative of past behavior. A charcoal sample was also recovered from F10, which was submitted for radiocarbon analysis, and returned a date of 7020 ± 25 radiocarbon years before present (RCYBP). The calibrated age ranges at 2-sigma are 7794-7883 BP and 7886-7933 BP.

A total of 29 pieces of lithic debitage, weighing 14.0 g, were recovered from this basin house (Table 41). Most of the assemblage consists of small flakes (SG-4) and are untyped, although larger flakes are present. Chert dominates the materials. Both of the larger, SG-2 flakes as well as the shatter are chert, indicating some reduction of larger chert pieces occurred in this activity area. The highest densities of flakes were located in three areas, all around F10, although none of these areas had high total numbers of debitage (Figure 32). One area lay between F10 and F14, the other two areas were along the perimeter of the house.

Table 41. Summary description of lithic assemblage for H15AA

		n	%
Material	Chalcedony	1	3.4
	Chert	24	82.8
	Quartz	1	3.4
	Quartzite	3	10.3
Size Grade	2	3	10.3
	3	9	31.0
	4	17	58.6
Debitage Type	Shatter	1	3.4
	Simple flake	4	13.8
	Complex flake	6	20.7
	Pressure biface thinning flake	1	3.4
	Untyped (SG 4)	17	58.6
Cortex	Non-cortical	24	82.8
	Cortical	5	17.2
Thermal Alteration	Burned	2	6.9

One large, unhafted biface (Cat. No. 860) was recovered from along the eastern perimeter of the house nearest to F10 (Figure 33). It exhibits light use wear and was probably used as a cutting implement. The tool is in an early stage of manufacture and may have been minimally used prior to deposition.

One milling implement, a complete mano (Cat. No. 746) was recovered from the F15 house activity area. It is an intensely utilized tool, with one end heavily battered, indicating reuse as a pounder or hammer stone. It was located on the west side of F14 (Figure 34). One small piece of sandstone of unknown function (Cat. No. 766) was recovered from the north half of F10.

A total of 290 bone fragments were recovered from F15. Of these, 140 are burned. The remains of one cottontail, two jackrabbits, one pocket gopher, one mouse, unidentified rodent, small mammal, and medium mammal are included in the remains. The majority of the burned specimens were concentrated in the southern part of the house (Figure 35) and are unidentified small mammal (n=103, 74%); the only positively

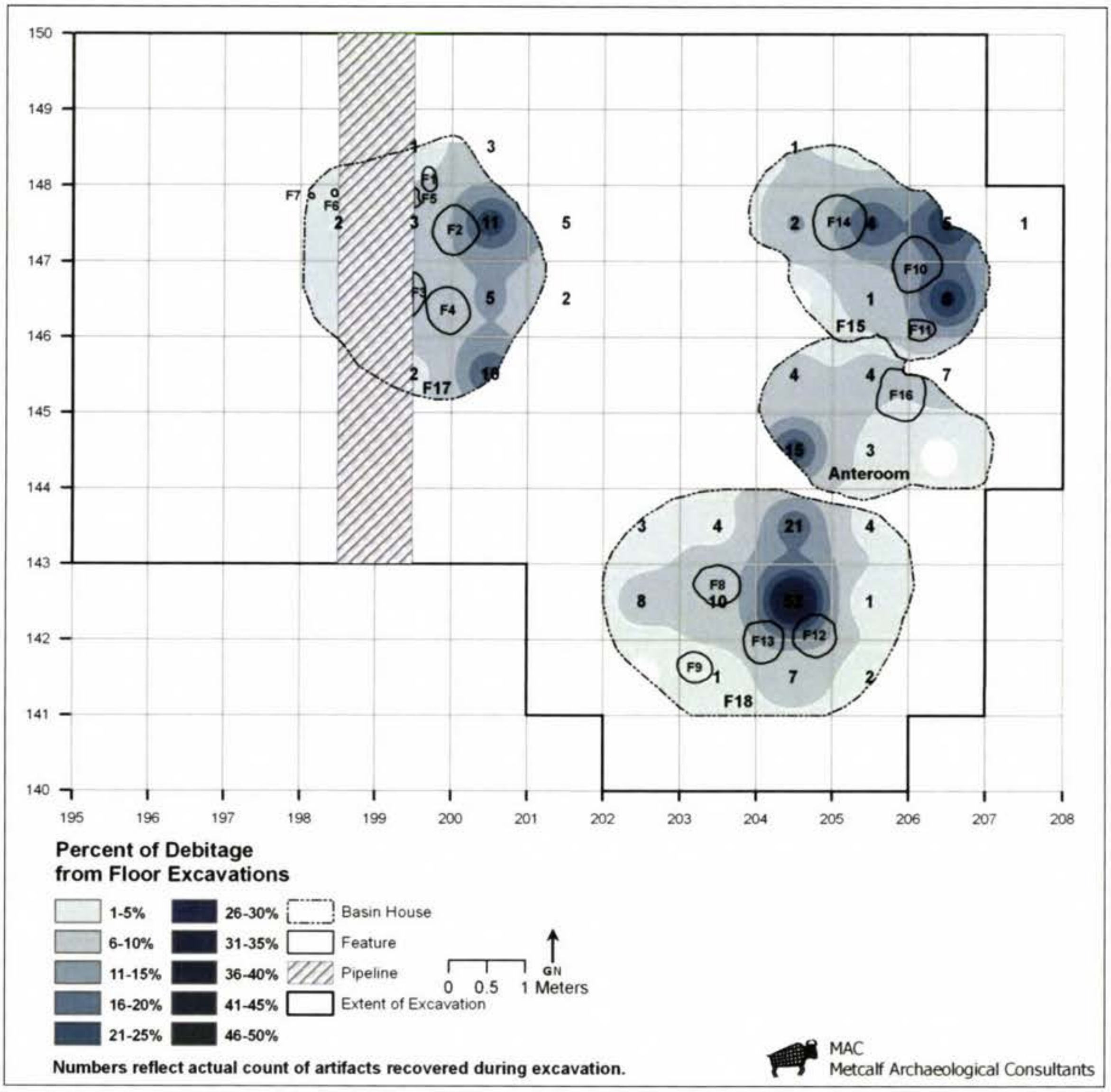


Figure 32. Distribution of debitage from house floors

identified burned remains were 13 leporid (rabbit) specimens. The highest density of bone fragments was located along the southwest perimeter of the house opposite the pit features, with decreasing amounts around both of these features. F10 had higher densities surrounding it than did F14 (Figure 36).

Seven pieces of FCR, weighing a total of 312 g, were recovered from the F15 activity area. The majority of the pieces are less than 5 cm, and two pieces larger than 5

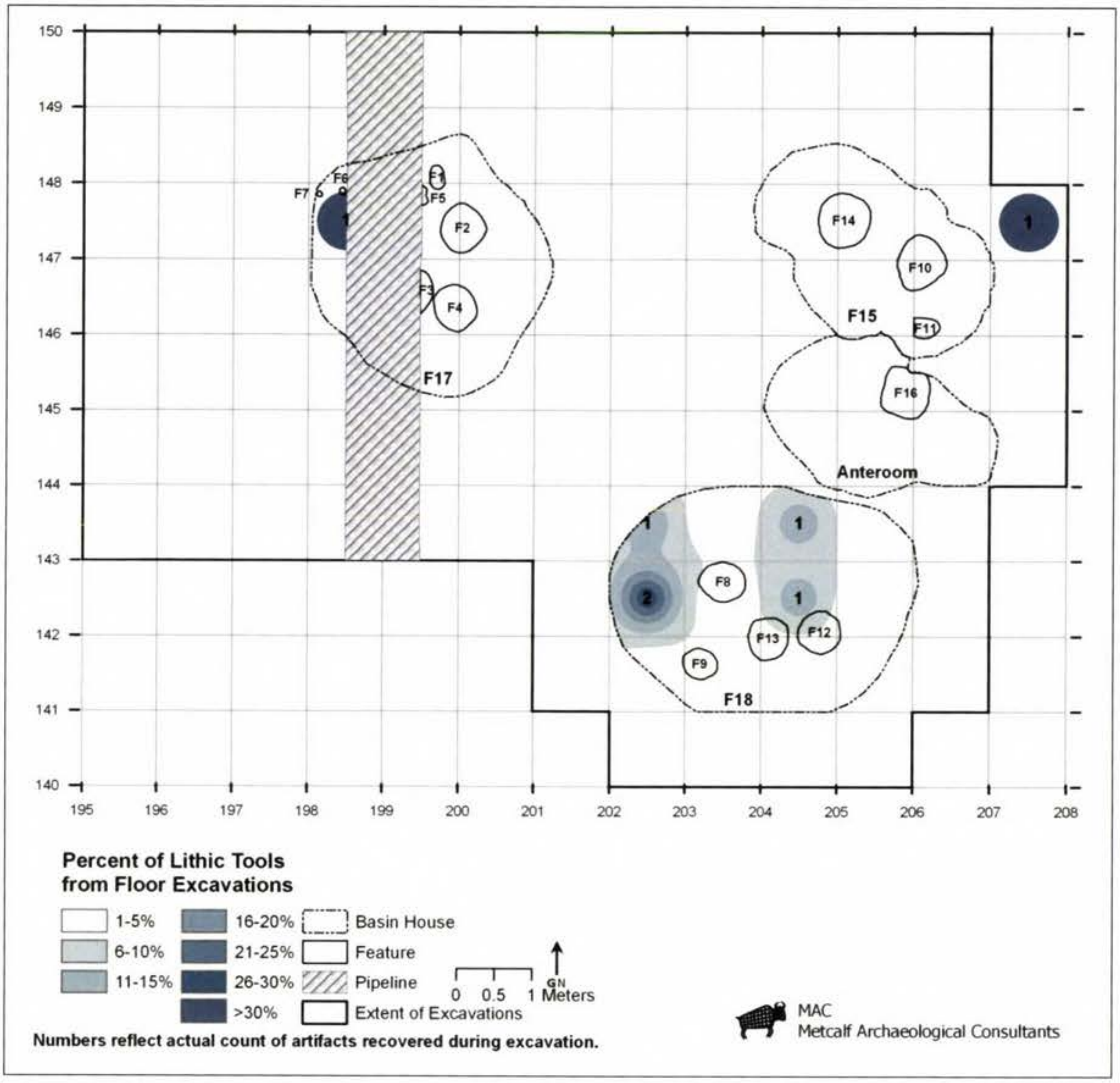


Figure 33. Distribution of tools from house floors

cm, which weigh 182 g, are also present. Most FCR was concentrated around F14, with some scattered over the rest of the floor in low densities (Figure 37). One piece of FCR (S-116) was submitted for lipid analysis. Results indicate it was previously in a feature in which a large herbivore, as well as seeds and/or nuts, were cooked.

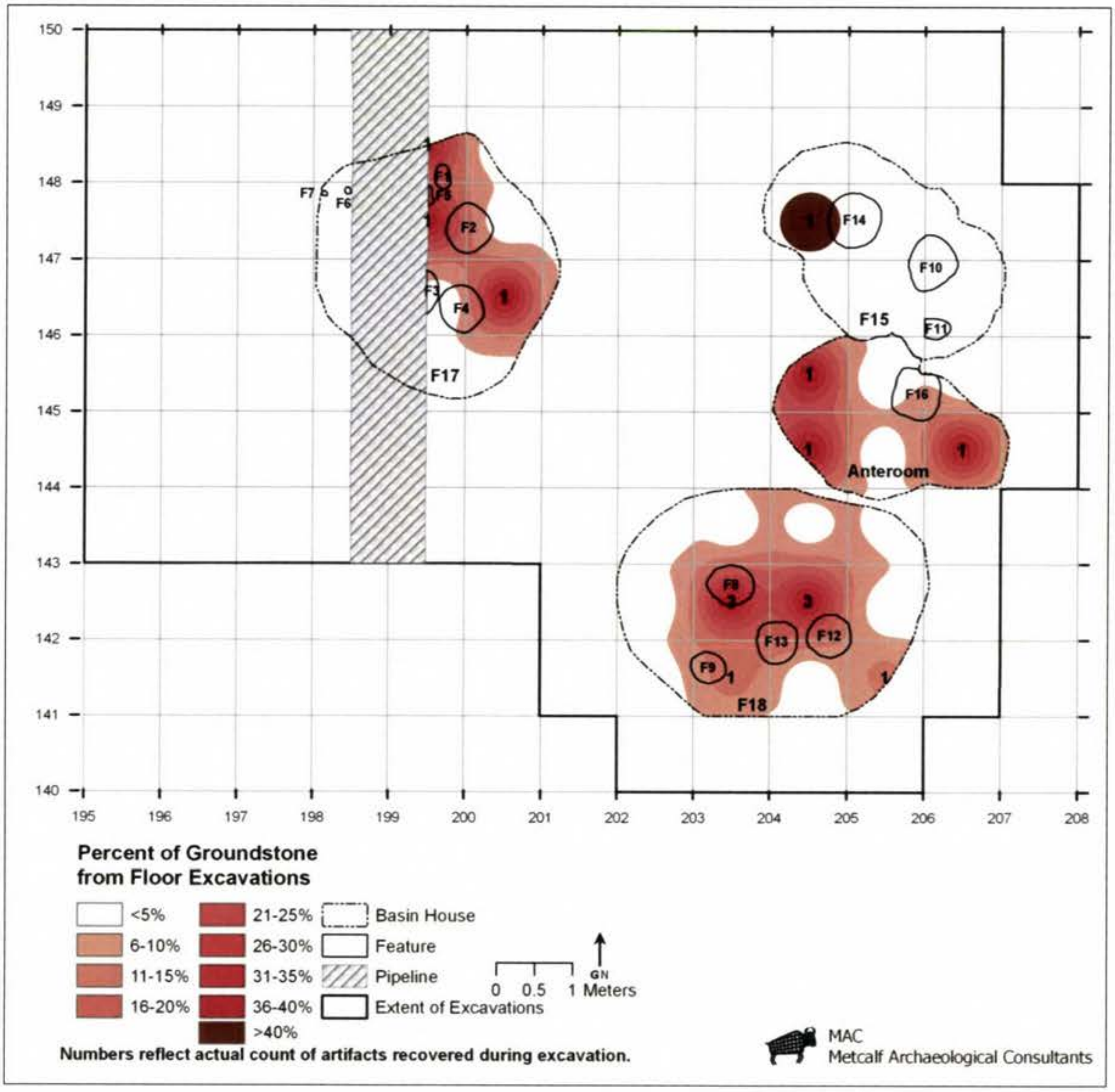


Figure 34. Distribution of ground stone from house floors

Discussion of F15 Activity Area

The total quantity and diversity of artifacts within this house are low. Faunal remains are most numerous and were concentrated along the perimeter of the house, suggestive of efforts to clear the interior of the structure and activity area of debris. But F10 also had higher amounts of faunal remains around it, particularly on the south side nearest the high density locale. Debitage was also concentrated around F10, but on the

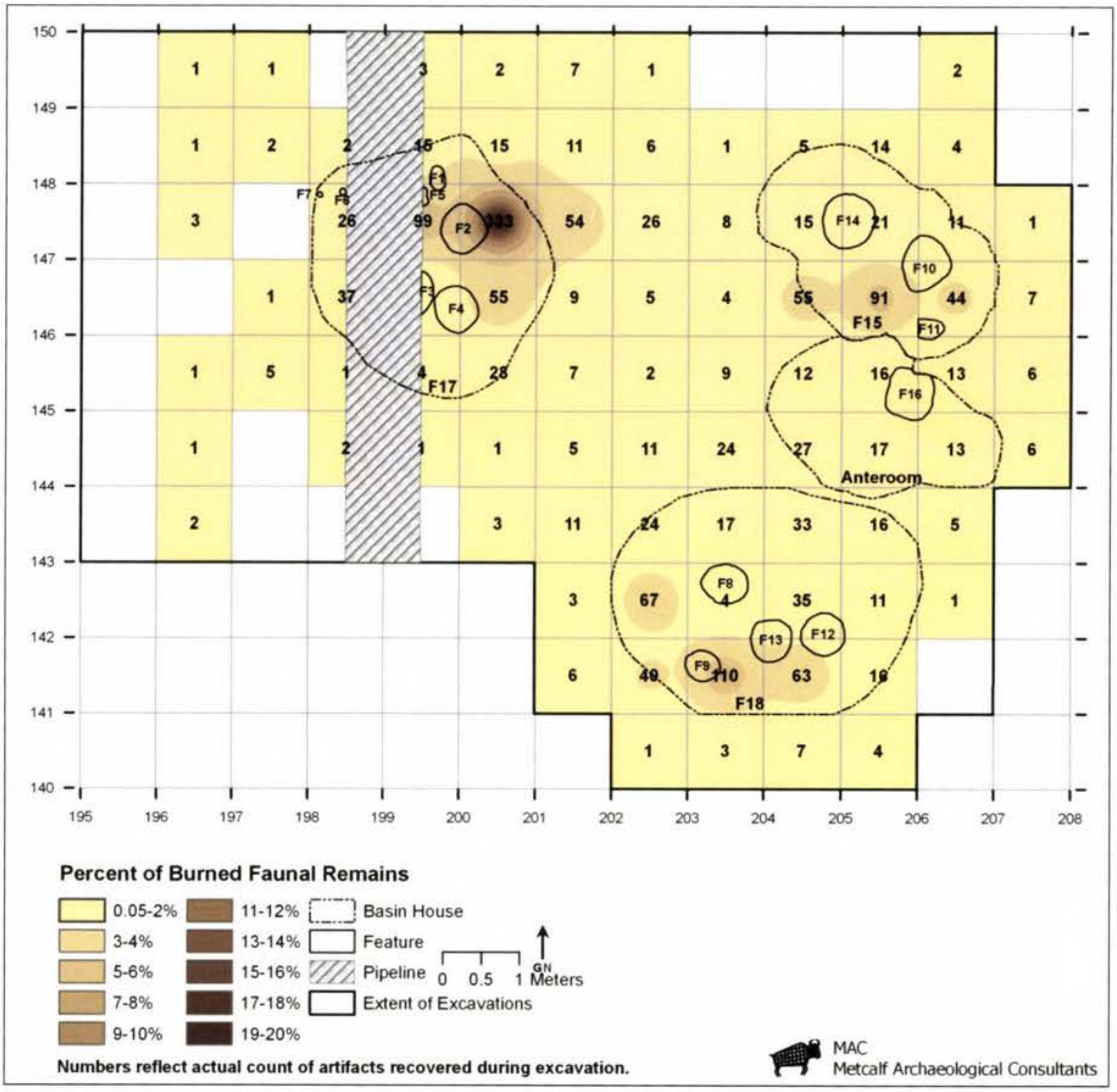


Figure 35. Distribution of all burned bone

opposite side from the bone fragments. The character of the lithic assemblage, which is dominated by small, non-cortical flakes, suggests tool maintenance or manufacture occurred at this locale, most likely biface maintenance. Only one chipped stone tool, an unhafted, mid-stage biface was recovered. F10 appears to have been the focus of activities within this house, both for food processing and lithic production. The mano

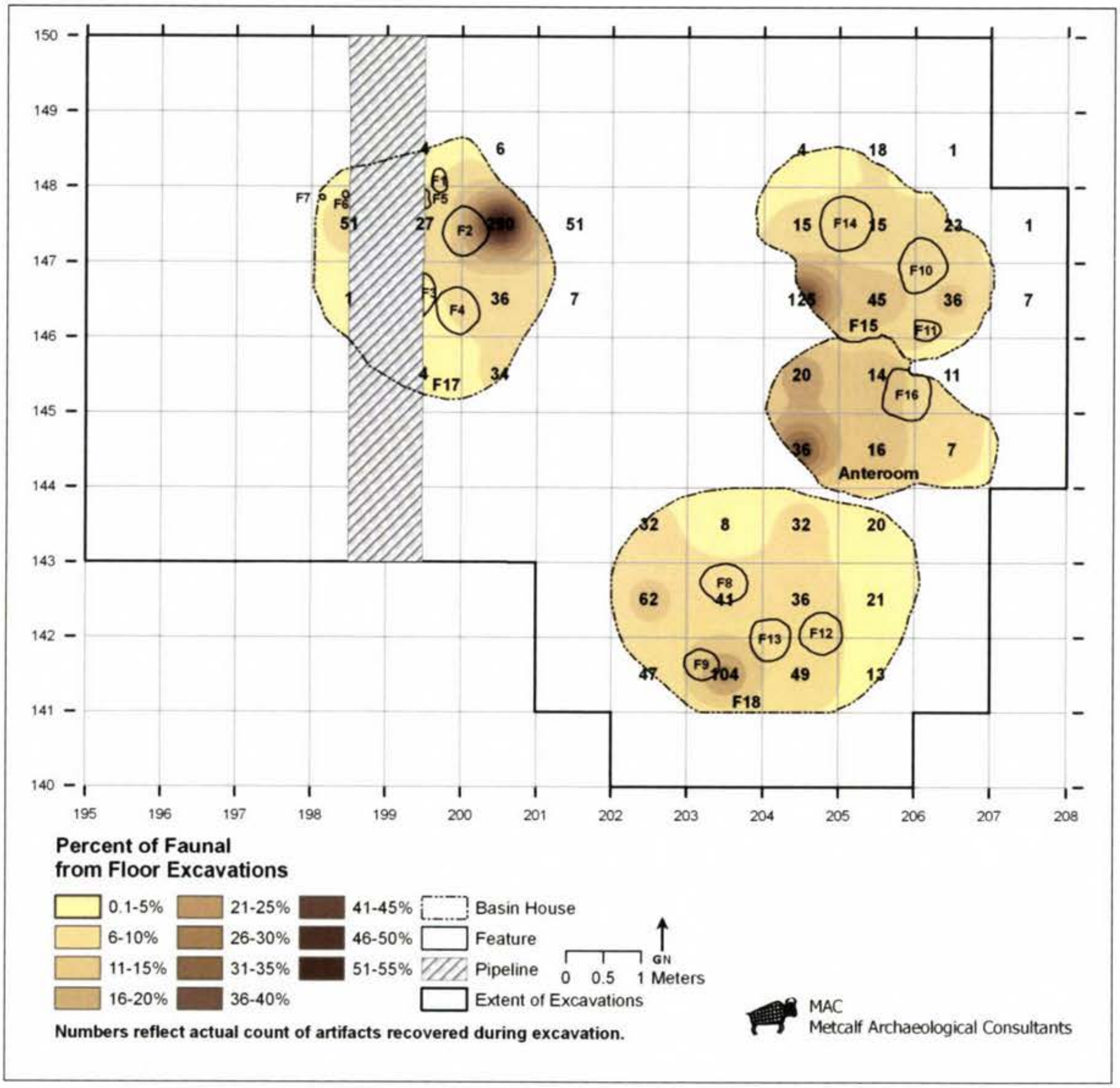


Figure 36. Distribution of all bone from floors

could likely have been utilized for processing the bone, fracturing them to access the marrow, rather than for grinding botanicals.

FEATURE 15 ANTEROOM ACTIVITY AREA (H15AAA)

Description

The anteroom was a shallow, basined area to the south of F15. It was oriented on approximately the same axis as the larger basin house and has been interpreted as a

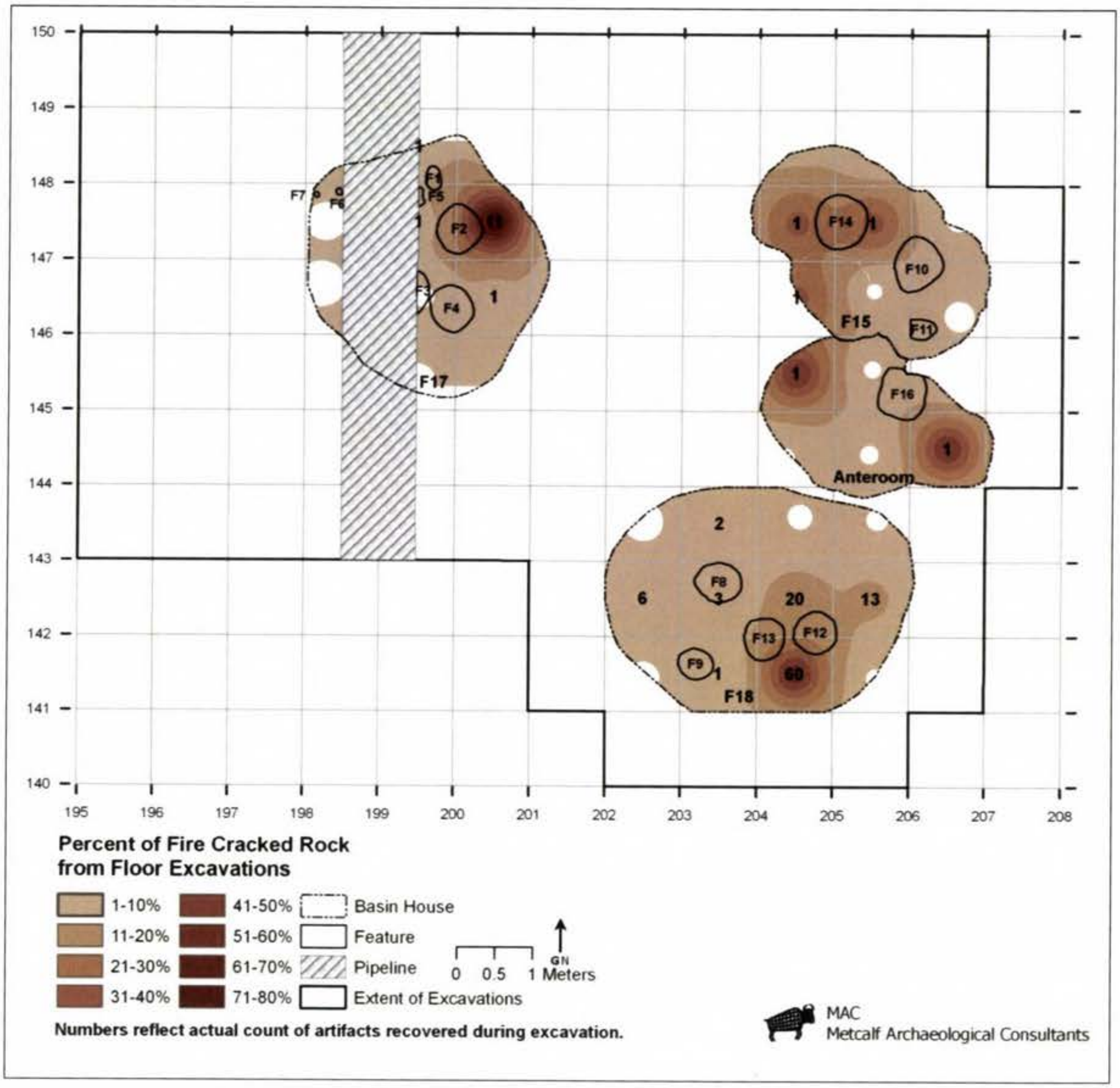


Figure 37. Distribution of FCR from floors

second room associated with F15. Alternatively, it may have served as an outer work area or sheltered, extra work room associated with the house, or possibly a fourth house superimposed on F15.

One feature, F16 was discovered in the interior of the anteroom (Table 42). It was heavily damaged by burrowing animals. It was located along the northern perimeter of the basin just east of the presumed entrance to the house. A sample of feature fill was floated with negative macrofloral results (see Table 36). Additionally, a charcoal sample recovered from the feature was sent for AMS ^{14}C radiocarbon analysis, and returned a date of 7130 ± 50 RCYBP, with one calibrate age range, at 2-sigma, of 7848-8026 BP.

Table 42. Summary of features in H15AAA

Feature No.	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts	Comments
				N-S	E-W	Depth			
--	anteroom	144-145N 204-206E	160	313	194	10-15	no	ground stone (3) other non-chipped stone artifact (1) debitage (36) bone (273) bone tool (1)	
16	basin hearth	145N 205-206E	161	70	77	44*	no	debitage (4) bone (65)	deep, steep-sided pit

* = presumed measurement

A total of 40 pieces of lithic debitage were recovered from the floor of this "anteroom". The flake assemblage is dominated by small (SG-4), untyped flakes (Table 43). SG-3 flakes are common, and SG-2 flakes are rare. Of the typed flakes, simple and complex flakes dominate the assemblage, and one pressure biface thinning flake was recovered. The majority of flakes are non-cortical, and only seven were burned. Chert is the most common material type used, with chalcedony, quartz, and quartzite present in higher quantities than in the activity area associated with F15. The highest density of debitage was along the southwestern perimeter opposite from F16, with a light scatter along the northern portion of the basin towards the location of F16 (see Figure 32). No chipped stone tools were recovered from the "anteroom" (see Figure 33).

Table 43. Summary description of lithic assemblage for F15 anteroom activity area

		n	%
Material	Chalcedony	4	10.0
	Chert	26	65.0
	Quartz	5	12.5
	Quartzite	5	12.5
Size Grade	2	1	2.5
	3	13	32.5
	4	26	65.0
Debitage Type	Simple flake	4	10.0
	Complex flake	10	25.0
	Pressure biface thinning flake	1	2.5
	Untyped (SG 4)	25	62.5
Cortex	Non-cortical	37	92.5
	Cortical	3	7.5
Thermal Alteration	Burned	7	17.5

Three milling implement fragments, including one mano (Cat. No. 868) and two metates (Cat. No. 456, 485), as well as one manuport (Cat. No. 455) were recovered from this activity area. The use facets of both metate fragments were heavily utilized, but the use facet of the mano was only lightly used. The manuport is one of several small, round stones recovered from this site. They are speculated to be sling shots, however, an alternative hypothesis is that these stones could be game pieces. The metate fragments and manuport were located in the western portion of the basin opposite F16, and the mano fragment lay to the southeast of F16 (see Figure 34).

A total of 104 bone fragments were recovered from the "anteroom" feature. Of these, 53 are burned; although present throughout the feature, no clustering of burned remains was noted. The remains of one cottontail, one jackrabbit, one ground squirrel, one pocket gopher, unidentified rodent, small mammal, and medium mammal were collected. As with the other features discussed, the majority of the burned specimens are unidentified small mammal (n=35, 66%). Cottontails and jackrabbits are the only positively identified taxa that exhibit burning (n=7, 13%), suggesting the other species are intrusive to the feature. The highest density of bone was located along the southwestern perimeter of the anteroom basin, with decreasing frequencies towards F16 (Figure 36).

Two pieces of FCR were recovered from this activity area. They are both burned and broken ground stone fragments. One was located on the western perimeter of the anteroom, and the other was located to the southeast of F16 (Figure 37).

Discussion of F15 Anteroom Activity Area

The quantity and diversity of artifacts within this activity area are low, similar to the adjacent F15 activity area. Artifacts tended to concentrate along the perimeter of the shallow basin, particularly the western margin. The only tools recovered are milling implements; no chipped stone tools were present. The lithic assemblage, dominated by small, interior flakes, indicates tool maintenance occurred in this area. Considering the distribution of flakes, this activity likely took place on the southeastern side of F16, probably closer to the edge of the anteroom. Both faunal remains and debitage were concentrated in the same area, likely a result of foot traffic through the area.

While there is a possibility that the "anteroom" is a fourth house, radiocarbon analysis of a charcoal sample from F16 predates the sample from F10 within F15 (see Table 4). This would indicate that the "anteroom" is not intrusive to F15, although it is possible that F15 is intrusive to the "anteroom". The dates from F16 are similar to those from F17, suggesting the two areas were possibly utilized during the same period of occupation. Considering the location of F16 near the doorway between the two rooms of the house, it is possible that the "anteroom" was occupied prior to the construction of F15. On the other hand, the "anteroom" could very likely represent a second room to F15, with both rooms built at approximately the same time and the house reoccupied over time. The distribution of artifacts away from the doorway between the two basins suggests this was a two-room house in which minimal plant processing occurred, and at least two leporids and possibly one medium-sized mammal were processed. The debitage assemblage, which is small and dominated by SG-4 flakes, indicates tool maintenance was also an activity in which the residents engaged, perhaps during these other activities.

FEATURE 17 ACTIVITY AREA (H17AA)

Feature 17 was the first basin house discovered at the site. It appears to have been the most intensively utilized based on the numbers of internal features. This house was also clearly reused, as evidenced by two features (F3, F4) nearly superimposed on each other.

Feature 17 had the highest number of internal features on the site, including four thermal pits and three possible postmolds. The thermal pits included F2, F3, F4, and F5 (Table 44). Features 3 and 4 were located in the south-central portion of the house immediately adjacent to each other. F3 had been partially destroyed by the trench, with approximately half of the feature removed. It was also partially excavated into the west wall of F4, indicating the house had been reused. Features 2 and 5 were located in the north-central portion of the house; F5 appears to have been a deep, steep-sided pit similar to Features 3 and 4 and was mostly destroyed by the pipeline trench. The three possible postmolds (F1, F6, F7) were located along the northern perimeter of the house. Their shape, size, and location are suggestive of poles that may have either acted as part of a support system for a shelter over the basin or possibly as posts on which to hang items such as meat.

Table 44. Summary of features in H17AA

Feature No.	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts	Comments
				N-S	E-W	Depth			
1	postmold	147-148N 199E	195	31	20	11	no	bone (16)	
2	basin hearth	147N 199-200E	200	70	60	6	no	debitage (2) bone (29)	shallow basin
3	basin hearth	146N 199E	197	58	18	28	no	debitage (2) bone (56)	deep, steep-sided pit
4	basin hearth	146N 199-200E	190	57	57	24	no	bone (57)	deep, steep-sided pit, charcoal sample for dating
5	basin hearth	147N 199E	200	28	8*	16+	no	none	deep, steep-sided pit
6	postmold	147N 198E	190	34	11	14	no	bone (3)	
7	postmold	147N 198E	199	16	14	14	no	bone (1)	
17	basin house	145-148N 198-201E	170	340	316	25	no	flaked stone tool (1) ground stone (5) other non-chipped stone artifact (1) debitage (54) bone (1123)	

+ = incomplete measurement; * = presumed measurement

Samples from each feature were collected and submitted for flotation and macrobotanical analysis. F2 yielded a few charred and uncharred Cheno-Am seeds as well as one uncharred grass seed, and small amounts of sagebrush charcoal. Ten charred Cheno-Am seeds were also recovered from F3, and F4 yielded uncharred Cheno-Am seeds. No macrofloral remains were recovered from F6 and F7 (see Table 36). Charred seeds are presumed to reflect subsistence use, suggesting F2 and F3 were utilized for plant processing; however, Cheno-Am plants produce thousands of seeds. The low frequency of charred seeds recovered from two features is more suggestive of incidental deposition than subsistence. Uncharred seeds are considered intrusive and not reflective of archaeological economic use. Small amounts of charcoal were recovered from the flotation from Features 2, 3, 5, 6, and 7 and none from F1 and F4. Charcoal samples collected in the field from F4 and from the upper portion of the fill overlying the house were submitted for radiocarbon analysis. The sample from the upper fill returned a date of 7190 ± 50 RCYBP, with two intercept date ranges of 7935-8072 BP and 8084-8159 BP at 2 sigma. Feature 4 returned a date of 7225 ± 25 RCYBP, with two intercept date ranges of 7970-8064 BP and 8087-8156 BP. While the radiocarbon dates suggest an elapsed time frame of about 30 years between the bottom of the house and the top of the cultural level overlying F17, the calibrated ranges overlap to a high degree.

A total of 54 pieces of lithic debitage were recovered from the floor of F17 (Table 45). Small (SG-4), untyped flakes dominate the assemblage. Larger flakes are present, including two SG-1 flakes, both of which are chert. One has cortex present and the other does not. All typed flakes are either simple or complex. The most common material type is chert. Few flakes exhibit evidence of thermal alteration, most of which were burnt; one flake appears to have been heat treated. The highest density of flakes was along the eastern perimeter of the house, with a concentration on the east side of F2, and two more around F4 (see Figure 32). Few flakes were concentrated along the western margin of the house, which was also the downslope side of the feature.

Table 45. Summary description of lithic assemblage for F17 activity area

		n	%
Material	Chalcedony	4	7.4
	Chert	44	81.5
	Quartz	2	3.7
	Quartzite	4	7.4
Size Grade	1	2	3.7
	2	4	7.4
	3	9	16.7
	4	39	72.2
Debitage Type	Simple flake	5	9.3
	Complex flake	10	18.5
	Untyped (SG-4)	39	72.2
Cortex	Non-cortical	50	92.6
	Cortical	4	7.4
Thermal Alteration	Heat altered	1	1.9
	Burned	7	13.0

One flake tool (Cat. No. 881) made of Morgan/Madison chert was recovered from the floor of F17. The edge angle and use-wear of the tool indicates it was used for cutting. It was located near the northwestern margin of the house basin (see Figure 33).

Three manos (Cat. No. 66, 83, 876), two metate fragments (Cat. No. 35, 299), and one small round piece of sandstone (Cat. No. 298) were recovered from this house. All three manos are complete, two of which were heavily used. The metates are large slab fragments and also exhibit heavy use wear. The non-chipped, non-ground stone artifact is a small, oblong-shaped rock of deteriorating sandstone that was speculated to be a sling shot, or possibly a game piece, although its function remains unknown. Two of the ground stone (Cat. No. 66, 299) were found one atop the other and above F2 (Figure 38). The remaining non-chipped stone tools were distributed along the northern perimeter of the house and just to the east of F4 (see Figure 34).

Figure 38. View east of F2 with two associated ground stone

The two ground stone associated with F2 were also submitted for pollen analysis. Both tools had quantities of grass pollen that were elevated above that of the background pollen rain, established in the pollen control samples. The metate (Cat. No. 299) also had elevated quantities of pine pollen. The mano (Cat. No. 66) had quantities of Cheno-Am and *Sarcobatus*-type pollen that were higher than the background pollen rain (see Table 39).

A total of 534 bone fragments were recovered from F17. Of these, 339 are burned; burned remains were concentrated around Features 2 and 4. Cottontail and jackrabbit were the only positively identified taxa in the basin; a minimum of two jackrabbits and two cottontails are represented. Additional Leporidae, small mammal and unidentified mammal fragments were also present, and the majority of the burned remains are small mammal (n=153, 45%) or unidentified mammal (n=147, 43%). The highest density of bone was located just to the east of F2, and along the eastern perimeter of the house. Lower densities were just to the west of F2 and F5 across the north-central portion of the house, and along the eastern portion of F4 (see Figure 36).

Eleven pieces of FCR were recovered from the floor of F17, weighing a total of 220 g. One piece is greater than 5 cm and weighs 110 g, and the remaining 10 are smaller than 5 cm, weighing a total of 110 g. Additionally, all three of the complete manos recovered from this activity area were burned, indicating their last use was as FCR. They are all greater than 5 cm and weigh a total of 1900 g. The highest density of FCR, excluding the ground stone, was along the northeastern perimeter of the house, just to the east of F2 (see Figure 37).

Discussion of F17 Activity Area

The locus of activity in F17 appears to have been F2, where the greatest concentration of lithics, ground stone tools, bone, and FCR were located. The lithics are dominated by small, interior flakes suggestive of tool maintenance, probably an embedded activity in relation to the other activities that occurred in this house. The larger flakes (SG-1, S-2) tended to be along the perimeters of the house, indicative of clearing the living surface of larger artifacts. The one flake tool present was used for cutting, perhaps in the processing of the faunal resources. The fauna is overwhelmingly fractured leporid bone, suggestive of intensive processing. One of the complete manos recovered from the house basin was also reused as a hammer stone, perhaps to break the bone, or in core reduction, suggested by the presence of the larger flakes. The ground stone tools were heavily utilized, and two of them, a mano and slab metate fragment, were discovered in association with each other and with F2. Pollen results from these two ground implements suggest utilization of grass; one uncharred grass seed was recovered from the fill of F2. Grass is an economic plant, although one with a lower rank for available food resources. This utilization of such a low ranked but storable resource suggests that F17 was utilized during a period of low resource availability, such as the late winter or early spring.

FEATURE 18 ACTIVITY AREA (H18AA)

F18 is presumed to have been a basin house, although it was impacted by a drainage channel shortly after occupation and was difficult to identify.

Four internal features were discovered within the margins of F18, including F8, F9, F12, and F13 (Table 46). F9 was located along the southwestern margin of the house. The remaining three features were more centrally located. F8 lay in the west-central portion of the house and was partially destroyed by a prehistoric drainage channel. Features 12 and 13 lay adjacent to each other in the south-central portion of the house.

Table 46. Summary of features in H18AA

Feature No.	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts	Comments
				N-S	E-W	Depth			
8	basin hearth	142N 203E	177	55	57	33	no	debitage (5) bone (66)	deep, steep-sided pit
9	basin hearth	141N 203E	155	42	43	4	no	bone (24)	shallow basin
12	basin hearth	141-142N 204E	161	64	54	16	no	debitage (3) bone (37)	deep, steep-sided pit
13	basin hearth	141-142N 203-204E	162	52*	53*	19	no	debitage (9) bone (25)	deep, steep-sided pit, slightly bell-shaped on north, charcoal sample for dating
18	basin house	141-143N 202-206E	133	380	296	35	no	flaked stone tool (7) ground stone (7)	

Feature No.	Type	Grid Units	Top Depth (cmbs)	Dimensions (cm)			Oxidation?	Artifacts	Comments
				N-S	E-W	Depth			
								hammer stone (1) other non-chipped stone artifact (1) debitage (148) bone (1135)	

* = presumed measurement

Samples from each feature were submitted for flotation and macrofloral analysis. No charred remains were recovered, however, uncharred Cheno-Am seeds were recovered from F8 and F12 (see Table 39). Uncharred seeds are considered intrusive and not indicative of archaeological economic activity. Sagebrush charcoal was recovered from F12 fill, indicating likely use as fuel wood, and small amounts of charcoal were recovered from the fill of F8. Charcoal recovered in the field from F13 was submitted for radiocarbon analysis and returned a date of 7285 ± 30 RCYBP with one intercept date range of 8022-8170 BP, at 2-sigma.

A total of 165 pieces of lithic debitage were recovered from this activity area. Debitage is dominated by small (SG-4), untyped flakes, although larger SG-3 flakes are present in higher quantities than any other activity area on the site (Table 47). Of the typed flakes, simple and complex are most common. Five pressure biface thinning flakes were recovered as well as one piece of chert shatter. Chert is the most common material type utilized. Other material types include chalcedony, quartz, and basalt. No quartzite flakes were recovered, and quartz flakes are present in higher quantities than the other activity areas. Flakes were concentrated just to the north of F12 and F13, with a scatter to the north and less dense concentrations to the west around F8 (see Figure 32). Low densities of debitage continued to the perimeters of the basin area.

Table 47. Summary description of lithic assemblage for F18 activity area

		n	%
Material	Basalt	8	4.8
	Chalcedony	1	0.6
	Chert	144	87.3
	Quartz	12	7.3
Size Grade	2	5	3.0
	3	39	23.6
	4	121	73.3
Debitage Type	Shatter	1	0.6
	Simple flake	19	11.5
	Complex flake	23	13.9
	Pressure biface thinning flake	5	3.0
	Untyped (SG 4)	117	70.9
Cortex	Non-cortical	143	86.7
	Cortical	22	13.3
Thermal Alteration	Heat altered	1	0.6
	Burned	16	9.7

Six flaked tools and one unhafted biface were recovered from this activity area. The biface (Cat. No. 510), a stage 3 fragment, was found on the north side of Features 12 and 13. It was likely used for cutting. The flake tools were all used for cutting, displaying generally moderate use wear. Two (Cat. No. 538, 663) were also used as gravers. The biface was located near F12 and F13, and the flake tools were all located along the margins of the basin (see Figure 33). Two of the tools (Cat. No. 291, 511) refit with fragments from other portions of the site (see Table 9), one of which (Cat. No. 126) was adjacent to F17, although at a higher elevation in the occupation deposits.

Nine non-chipped and ground stone tools were recovered from this activity area. They include six manos, one incomplete slab metate, one dedicated hammer stone, and one manuport. Most of the milling implements were heavily utilized. The hammer stone did not exhibit any use wear that would suggest it had been used as anything other than a hammer stone; it was heavily utilized. The metate fragment (Cat. No. 576) was subjected to pollen analysis, which recovered grass and pine pollen in quantities higher than the background pollen rain. Both types of plants were economically important in prehistory, although it is unclear if the presence of this pollen indicates such usage here. Finally, one large quartzite cobble was found in this activity area. Its function is unknown and it exhibited no use modifications. It was apparently not burned.

The majority of the ground stone tools were concentrated between the large pit features, particularly north of F12 and F13, and between F8 and F13 (see Figure 34). The slab metate was found along the eastern edge of F8 and likely represents "site furniture" (Binford 1978), a portable artifact which was left at the site in anticipation of return and reuse of the artifact. The remaining non-chipped stone tools (hammer stone and manuport) were located along the outer perimeter of the basin.

A total of 465 bone fragments were recovered from F18. Of these, 179 are burned. F18 is the most taxonomically diverse of the four houses. The remains of two cottontails, two jackrabbits, one ground squirrel, one prairie dog, two pocket gophers, one mouse, unidentified rodent, small mammal, and medium mammal were collected. The majority of the burned remains were concentrated in the southern part of the house and are unidentified small mammal (n=140, 78%), followed by leporids (n=30, 17%). Cottontails and jackrabbits are the only positively identified taxa that exhibit burning (n=179, 38%), suggesting the other species are intrusive to the feature, with the possible exception of the medium-sized mammal. The highest concentration of bone was between F9 and F13 (see Figure 36), possibly representing a debris pile from cleaning one or the other feature.

FCR recovered from this activity area numbered 101 pieces and weighed 2,750 g, excluding the burned manos. Fifteen pieces are larger than 5 cm and constitute the bulk of the weight of the recovered FCR (2,050 g). There are also 86 fragments smaller than 5 cm, weighing 700 g. The highest concentration of FCR was just south of F12 and F13 along the perimeter of the house, with slightly lower densities to the north and west of the features (see Figure 37). Small amounts of FCR were scattered to the west and north of the activity area. All six of the manos and mano fragments recovered from this activity area were burned. Five were larger than 5 cm and weighed a total of 2163 g. One mano fragment is smaller than 5 cm and weighs 30 g.

Discussion of F18 Activity Area

The locus of activity in this area appears to have been the deep pits, Features 8, 12, and 13. Activities included more intensive tool maintenance and potentially some manufacture as indicated by the presence of the hammer stone, and faunal and plant processing, as well as possibly the processing of a medium-sized mammal, such as a pronghorn, and several leporids. The highest frequencies of debitage and bone surrounded the three deep pit features located near the center of the house. The highest quantities of debitage and ground stone were recovered here. The debitage was dominated by small, interior flakes. Few pressure biface thinning flakes, indicative of the final stages of tool manufacture or maintenance, were present on this site; a little more than half of them were recovered from this house.

Ground stone included one incomplete slab metate. It was discovered next to F8 with the use side facing down. Additionally, six manos and mano fragments were recovered, again representing the highest quantities of any of the four activity areas. All of the ground stone exhibited heavy use wear, suggestive of intensive use of the area.

Very little information about what plants were processed is available though. Only grass pollen was present in higher than background frequencies and the flotation results were negligible. Plant processing activities appear to have been more focused on the western portion of the activity area, with most of the ground stone recovered from this area.

The highest quantities of flake tools were also present in this house. Most of the tools appear to have been used for cutting, suggesting some butchering and possibly cooking of rabbits or an artiodactyl was taking place in this locality, particularly in light of the high numbers of bone fragments present. The faunal assemblage was most varied in this house, with intrusive rodents making up a significant portion of the assemblage. This area was also the most heavily disturbed by burrowing animals. Most of the debris was concentrated near the center of the house, leaving the perimeters relatively clean, with the exception of the bone which was concentrated more at the west and south end of the house than the east or north end. The artifact distributions are suggestive of hearth-centered activities, including tool maintenance and manufacture, as well as floral, particularly grass seed, and animal processing.

NON-FLOOR DISTRIBUTIONS (NFDA)

Description

All artifacts not included in the house activity areas are included in the non-floor distributions. Vertical distributions indicate the majority of artifacts were recovered from the 20-30 cm above the floors of the houses, although there was a diffuse scatter of artifacts, largely bone, in the upper levels of the cultural deposits. Refits of flake tools and ground stone indicate vertical movement through the deposits as well as horizontal movement across the site. This is an important bit of data, as it indicates the processes that contributed to site formation and integrity of artifact locations. The depth of the cultural fill (ca. 50 cm), particularly compared to the natural depth of the paleosol (ca. 15 cm), was likely thickened as a result of occupation, with people walking around the exteriors of the houses. The well-sorted, sandy nature of the sediments allow for churning to a greater depth (5-16 cm) than would sediments with higher silt or clay contents (Gifford-Gonzalez et al. 1985; Stockton 1973). One effect of this churning is that artifacts become more easily lost and are removed from the effects of cleaning activities (Schiffer 1987). This means they are more likely to be located near their primary discard area and will convey information regarding activity areas. While bioturbation can impact the locations of artifacts, and may have been a factor at this site, I believe the integrity of the artifact assemblages is good and can inform us what behaviors occurred and where they occurred, thus providing data for interpretation of feature and site function.

No features outside of the houses were discovered. Likewise, none were discovered intrusive to the fill of the houses, suggesting outside activity areas associated with the later occupations of the houses.

A total of 483 pieces of lithic debitage was recovered from the non-floor area. Almost half of the debitage is small (SG-4), untyped flakes, with larger, SG-3 flakes also dominant. The largest, SG-1 and SG-2 flakes, are common (Table 48). The majority of debitage is non-cortical, interior flakes, suggestive of the later stages of lithic reduction.

Approximately half of the flakes are simple or complex, with both percussion and pressure biface thinning flakes present in small quantities. Shatter is also present in minimal quantities. The majority of debitage is made of chert, with quartzite, chalcedony, and quartz present in significant numbers. Basalt, petrified wood, and siltstone were also present in rare quantities. In addition, one obsidian flake was recovered and sourced to Big Southern Butte in southeastern Idaho.

Distributions of debitage generally reflect the same distributions as the house floors. There were higher densities of flakes above the interior features of the houses with the exception of F16. Floor densities of debitage in H15AAA were along the southwestern perimeter of the basin, suggestive of a trash midden, while the non-floor distributions do not indicate concentrations within the area above the anteroom basin. Non-floor densities above H15AA show a concentration to the southwest of F10, whereas the floor distributions were to the north and east. Likewise, the non-floor distributions above the H18AA show a concentration of debitage on the south side of F12 and F13, while the floor densities were to the north (Figure 39). Considering the vertical movement of artifacts noted in association with the flake tools mentioned above, these distribution patterns could be the result of either rodent activity in the vicinities of the features or trampling and scattering by the occupants.

A total of 30 tools were recovered from the non-floor distributions, including three unhafted bifaces, three hafted bifaces, 21 flake tools, one core, and two tested cobbles. Except for the two tested cobbles, all of the tools are made from chert. The tested cobbles are quartzite. All of the flake tools have at least one edge utilized for cutting, and five were also used for graving. Most were moderately to heavily utilized;

only three exhibit light use wear. The highest densities were just to the west of the F15 anteroom, between F18 and F15, with another concentration just to the southeast of F17 (Figure 40).

Table 48. Summary description of lithic assemblage for the non-floor distributions

		n	%
Material	Basalt	2	0.4
	Chalcedony	22	4.6
	Chert	382	79.1
	Obsidian	1	0.2
	Petrified Wood	1	0.2
	Quartz	18	3.7
	Quartzite	55	11.4
	Siltstone	2	0.4
Size Grade	1	2	0.4
	2	43	8.9
	3	197	40.8
	4	241	49.9
Debitage Type	Shatter	5	1.0
	Percussion biface thinning flake	1	0.2
	Simple flake	122	25.3
	Complex flake	114	23.6
	Pressure biface thinning flake	3	0.6
	Untyped (SG-4)	238	49.3
Cortex	Non-cortical	423	87.6
	Cortical	60	12.4
Thermal Alteration	Heat altered	6	1.2
	Burned	74	15.3

A total of 54 non-chipped and ground stone tools were recovered from the non-house floor distributions. These include 16 slab metates and metate fragments, 21 manos and mano fragments, four unknown ground stone fragments, nine minimally modified non-chipped stone artifacts, and six manuports. Most of the metates and metate fragments are sandstone, while quartzite is slightly more common for manos. The majority of the milling implements are fragments. Overall, the milling implements tend

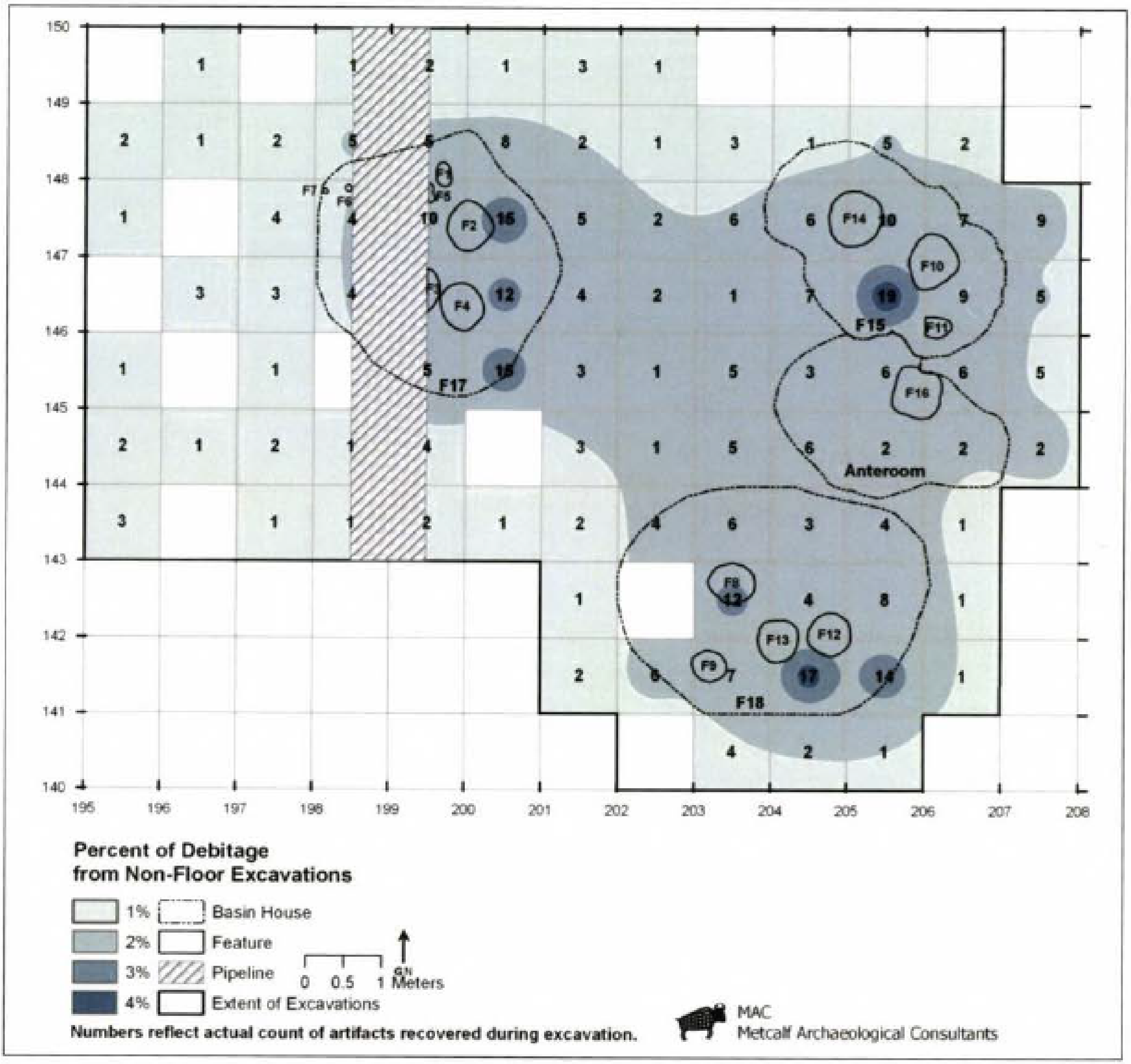


Figure 39. Distribution of debitage from non-floor contexts

to be intensely processed, but more exhibit light use wear than heavy. Neither manos nor metates show a trend concerning intensity of wear, with equal numbers of each class heavily used as opposed to lightly used. Five manos were also reused as hammer stones, all of which exhibit light utilization of the battered end. Finally, 18 were burned and appear to have been used a final time as FCR. The minimally modified artifacts include two cobbles exhibiting light polish, and seven small, round pieces of sandstone that may

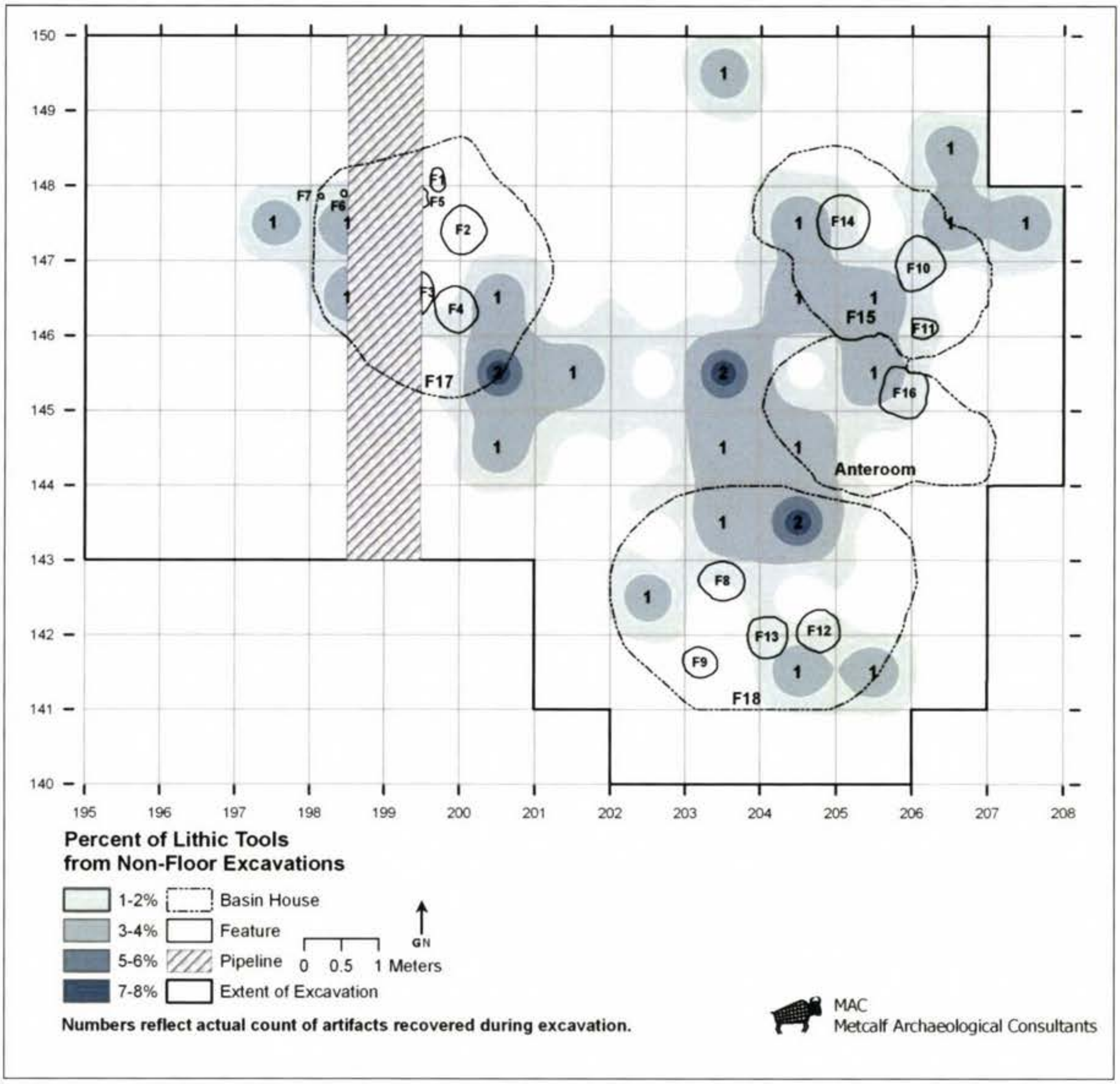


Figure 40. Distribution of tools from non-floor contexts

be either gaming pieces or sling shots. All six of the manuports are large (>200 g), and most are made from coarse-grained, friable sandstone.

The highest concentration of ground stone tools was in the space between the houses, particularly just to the west of F18 (Figure 41). There was a light scatter of ground stone tools in the vicinity above F18, suggesting this portion of the site was

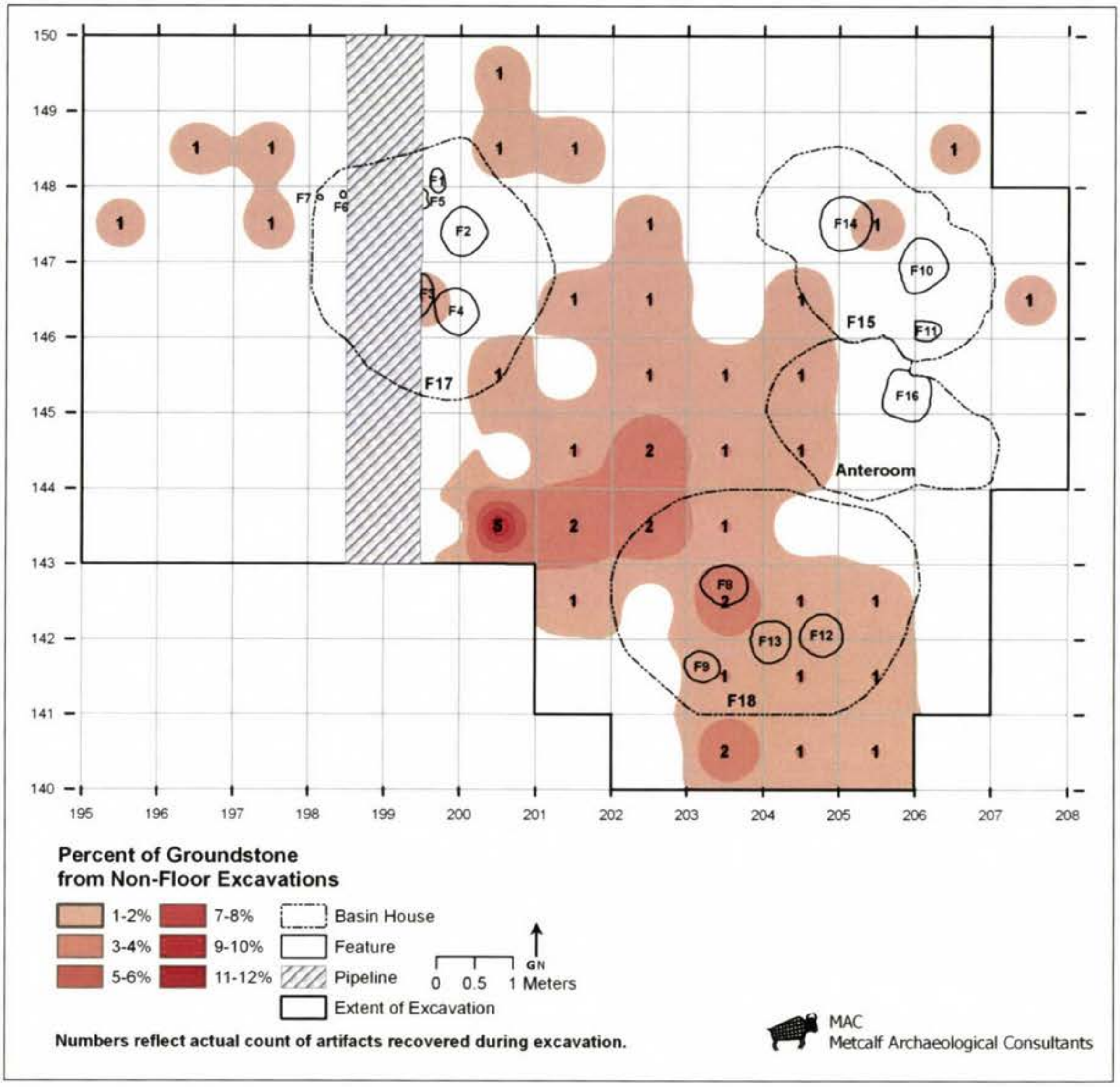


Figure 41. Distribution of ground stone from non-floor contexts

utilized as a plant processing area. Three of the slab metate fragments refit with two fragments from the H18AA floor.

A total of 2,154 bone fragments were recovered from the non-floor distributions. Of these, 994 are burned. Similar to the debitage distributions, the non-floor faunal remains were also distributed in the same pattern as the floor distributions, with concentrations around F2, F9, and F10. Outside of these locations, the areas with the highest densities of bone occurred in the space between the houses, with lower amounts towards the edges of the excavation block and the presumed occupation area (Figure 42).

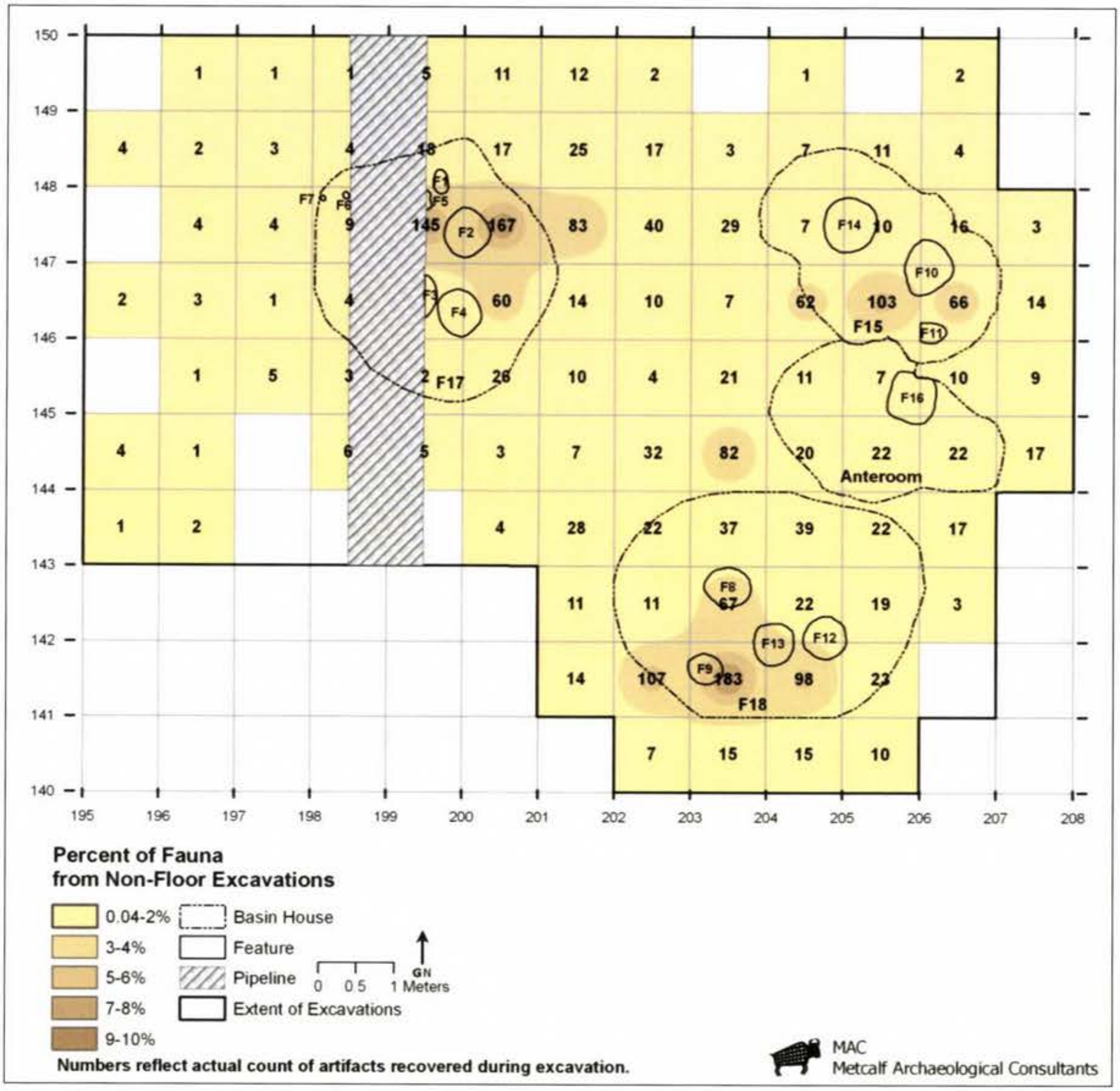


Figure 42. Distribution of bone from non-floor contexts

A total of 171 pieces of FCR weighing 6,720 g, excluding ground stone reused as FCR, was recovered from the non-floor distributions. Thirty-four pieces are larger than 5 cm and weigh 4,560 g, and 137 pieces are smaller than 5 cm, weighing 2,160 g. Distributions were similar to the floor distributions, with concentrations above the feature locations. Few to no FCR were recovered in the areas above F15 and the "Anteroom" activity areas. The FCR was mainly scattered between F17 and F18 (Figure 43). Seventeen of the 21 manos and mano fragments were burned. Most are fragments, although four of the seven complete manos were also burned. Five mano fragments are smaller than 5 cm and weigh 450 g, and 12 manos, including four complete manos, are larger than 5 cm and weigh 4770 g. While these artifacts were apparently last used as FCR, their distribution is scattered and not concentrated around any of the features.

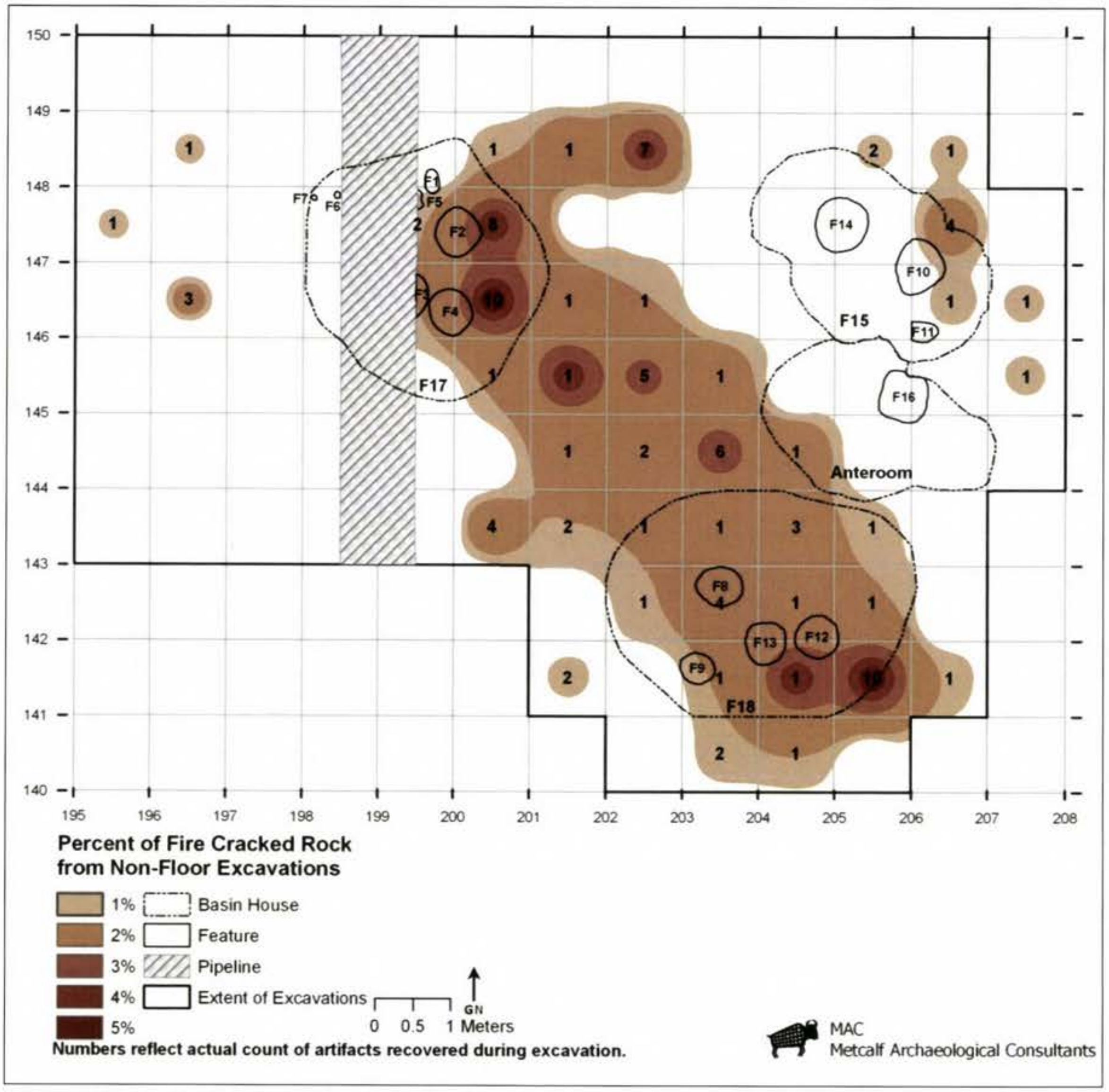


Figure 43. Distribution of FCR from non-floor contexts

Discussion of Non-Floor Distributions

The highest density of artifacts tended to be above and around the features in nearly the same distribution patterns as the floor distributions, likely as a result of trampling around the interior features and between the houses. Overall, artifacts tended to concentrate above the house activity areas described above, with lighter densities in the space between the houses. Artifacts were scarce around the perimeter of the block, which encompassed a small area outside the presumed main focus of activities. Only bone fragments were present in higher quantities in these perimeter areas. Flake tool refits indicate both horizontal and vertical movement of the artifacts, possibly during the occupation of the houses.

Vertically, the majority of artifacts were recovered within the 20-30 cm above the house floors, with low numbers in the levels above. This could be the result of rodent activity, which was heavily apparent in the lower levels of the excavation. There is no reason to assume the rodent activity was less intense in the upper levels. Other environmental factors, such as freeze-thaw processes (Hilton 2003; Miller 1992; Schiffer 1987) or insect transport, could also account for the presence of artifacts in the upper levels. Degree of patination and carbonate encrustation is similar on the artifacts. There is no evidence to suggest the artifacts "floating" above the main cultural level derive from a later occupation.

The majority of stone tools recovered from the site were from the non-floor distributions, with flake tools concentrated in the southeastern portion of the occupation area and the highest densities of ground stone tools located in the southern portion of the site. All of the flake tools have at least one edge that was utilized for cutting, presumably of the rabbit prey so prevalent in the faunal assemblage. There is, however, no apparent correlation between concentrations of flake tools and concentrations of bone fragments that may suggest a butchering station. The ground stone tools, on the other hand, concentrate at the southern end of the site, particularly above and around F18. This suggests the area was utilized as a processing area for floral resources. The results of pollen analysis of select ground stone are not conclusive as to what plants may have been processed.

The highest densities of both flakes and bone fragments tended to be above the houses, suggestive of refuse deposits. It seems likely that F17 and F18 in particular were used as refuse pits during the occupation of F15, with smaller deposits above and around the hearth features. The fragmentary nature of the bone could be the result of trampling during the occupation and occasional cleaning of the living areas rather than the result of processing for marrow or bone grease.

SUMMARY

This chapter has shown that activities were fairly similar in each house, indicative of site function. Overall, no one activity dominated in the houses with the exception of F18 Activity Area, which had the highest concentration of ground stone. This cluster suggests plant processing was the main activity in F18, although the lithic assemblage suggests tool maintenance and possibly some tool manufacture were equally important here. The activities represented (e.g., tool maintenance, animal processing) focused around one interior basin in each house. In F17, both bone and debitage concentrate around F2, suggesting this shallow basin may have functioned as a light source. Contrasting this pattern is F18, where the debitage concentrates between the large pits

F12 and F13 and the bone is concentrated adjacent to the shallow basin F9. It is possible that in this house, this shallow basin functioned as either a toss pit or perhaps a rabbit processing area separate from the tool manufacture and maintenance activities that occurred near the large pits. Neither F15 nor the anteroom yielded many artifacts. Those that were present tended to concentrate along the outer perimeter of the basins, suggestive of cleaning episodes. Finally, the non-floor distributions revealed patterns very similar to the distributions noted for the floors of each house and the anteroom. Both flake tools and ground stone tools found in floor contexts refit with their counterparts found in non-floor contexts. While the flake tools are smaller and could have easily been moved by environmental factors that affected the surface of the site prior to burial or by the ubiquitous rodent turbation, some of the ground stone tools were larger and not found in areas that had been as heavily impacted by bioturbation. This suggests the integrity of the site is high and the inferences drawn from the artifact distributions more faithfully reflect the behaviors that resulted in the formation of the activity areas.

The next chapter will evaluate the contributions to prehistoric research that this site provides. Comparisons to other sites in the region will also be made, to better compare how 5MF6255 relates to the other known sites of Pioneer era-age.

CHAPTER 9: EVALUATION OF RESEARCH

INTRODUCTION

The archaeological investigations at site 5MF6255 resulted in the discovery of three Pioneer period basin houses, as well as fewer than 1,000 pieces of lithic debitage, 37 flaked stone tools, 56 milling implements or fragments of such tools, and 8,618 fragments of bone. The site was excavated as part of a larger cultural resources management (CRM) project and was selected for post-construction data recovery because it was presumed to date to either the Pioneer period or early Settled period of the Archaic era. A Pioneer period site, particularly a basin house site, would answer numerous questions about this early era in prehistory, including chronology, settlement patterns, subsistence practices, and lithic procurement and technology. All data obtained from such an old site is valuable as very few sites of this age have been investigated. One of the major questions asked was how is this site, with the above questions in mind, similar to or different from the preceding Late Paleoindian Era?

RESEARCH CONTRIBUTIONS

Cultural Chronology

Radiocarbon analysis of charcoal assays collected from various floor features, as well as one charcoal sample from the upper portions of the occupation layer, resulted in calibrated dates with extreme ranges from approximately 7800 to 8200 cal BP (see Table 4). These dates place the occupation of site 5MF6255 within the recently defined

Pioneer period of the Archaic era, which dates from 7300 to 9400 cal BP (Reed and Metcalf 1999). As I will discuss in more detail in the Comparison section below, there are 52 sites in northwestern Colorado and southwestern Wyoming that have at least one component that dates to the Pioneer period. Of these 52 sites, only three other basin house sites have been investigated.

Paleoenvironment

Evidence from geomorphological studies of the UBL pipeline in the mid-1990s allowed the development of a model that posited nine sedimentation events for the Spring Creek area. These events are characterized by sediment deposition, followed by a period of stability and soil development, after which was a period of erosion and/or renewed deposition (Metcalf and McFaul 2006). Paleoenvironmental studies undertaken for the combined Piceance Basin Lateral and REX pipeline projects support this model (Madsen et al. 2009). The studies were undertaken to try to gain an understanding of the paleoclimate in the region, with a special emphasis on the project area and how larger climatic changes may have impacted cultural adaptations. To that end, fossil packrat middens in the project area were sampled and analyzed. Sediment cores from two glacial bogs in the Flat Tops Wilderness Area were also taken and analyzed for pollen changes (Madsen et al. 2009).

Larger climatic shifts are reflected in vegetation communities, which generally adapt with a lag time in response to these changes. Global climatic changes that occur over a very short period result in discontinuities in the vegetation communities on a continental scale. One such discontinuity occurred at approximately 8100 cal BP, and was recognized from the analysis of the sediment cores as affecting this region. This period was also recognized in the geomorphic model for the Spring Creek area. The previous cycle, dating to approximately 9400-8100, was a period of increasing aridity and temperatures (Madsen et al. 2009:73; Metcalf and McFaul 2006). For a short, approximately 200-year period at the beginning of the next cycle (8100-6600 cal BP), the climate shifted to one of increased moisture and cooler temperatures, possibly as a result of the catastrophic draining of Lake Agassiz into the North Atlantic (Madsen et al. 2009).

There is a strongly developed paleosol at 5MF6255, which generally lies just above the bottom level of the houses. This suggests that the houses were constructed towards the end of the warming trend and just prior to the development of the paleosol. The radiocarbon dates of the oldest house bear this out, with a date of 8017-8122 cal BP (see Table 4). The final abandonment of the site, sometime after 7839 cal BP, also corresponds to the end of the mesic climatic conditions noted by Madsen et al. (2009) and McFaul (2009).

The evidence from the paleoenvironmental studies indicates xeric-adapted trees, such as Utah juniper, had reached this area by the time of site occupation. Pinyon pine, on the other hand, did not reach its northern extent in north central Colorado until several thousand years later. The vegetation communities present during the occupation of 5MF6255 were likely very similar to today, although the treeline was likely lower than present.

Seasonality

Very little information about seasonality was recovered from this site; what is available is inconclusive and indirect. The faunal assemblage is highly fragmentary in nature and almost entirely small mammal, with leporids representing the majority of the species identified, although medium-sized mammals are represented. These bones were too fragmentary to identify beyond body size and indicated possibly pronghorn or deer. Procurement of cottontails and jackrabbits was clearly an activity that occurred at this site, although how intensely the carcasses were processed is not known. Highly fragmented large mammal bone can be an indicator of intense processing for bone marrow and/or grease, which is often performed during times of low resource availability, such as the late winter/early spring (Reed and Metcalf 1999:64). Rabbit bone, however, is prone to breakage from other taphonomic processes, such as trampling, soil pressure, or freeze/thaw episodes. Thus, the highly fractured nature of the rabbit bone assemblage is not necessarily an indicator of a late winter/early spring occupation, although the bone from the medium-sized mammals could indicate this.

Other inconclusive, indirect evidence consists of an elevated quantity of grass pollen recovered from the ground stone wash analysis, although use of these milling implements for processing grass is tentative at best. Studies in Australia indicate that grass seeds are a lower ranked food and were exploited only during times of reduced access to higher ranked resources (Winterhalder and Smith 1981). Grasses pollinate in the late spring, with the seeds becoming available later in the summer. These are seasons when higher-ranked resources are available, however, grass seeds store well and may have been chosen for this storability (Simms 1987:79). It is possible that the seeds were stored in the pits during the late summer, then removed from the pits and ground during the late winter/early spring occupation.

Few formal tools were recovered from this site, with the majority of flaked stone tools consisting of utilized flakes. These are tools of expedience with a generally short use life, displaying one utilized edge, then discarded. Flake tools that display more than one utilized edge indicate more intensive use of the tool and conservation of material (Francis 1997). Approximately three-quarters of the toolstone material present at 5MF6255 are from sources within 40 km, with one source (Juniper Mountain) within 15 km and just south of the Yampa River. Of the 26 utilized flakes recovered from this site, 16 exhibited more than one use edge, and 12 of those 16 were moderately to heavily used. This indicates the occupants were conserving material, possibly because their stores were becoming low. With a source so close, access to additional material would likely be limited by the depth of snow cover and/or frozen ground, suggesting the site was occupied in the late winter/early spring when stored materials were at their lowest quantity and access to new material was restricted.

Finally, the distribution of the hearth basins is suggestive of cold weather. All of the fire pits were discovered within the floors of the houses and none were exterior, which is atypical of basin house sites (Shields 1998). Additionally, artifact distributions indicate nearly all activity occurred within the confines of the structures, with very little activity outside. This patterning suggests the inhabitants preferred to stay inside these shelters, likely for warmth as much as any other reason, indicative of cold season occupation of the site.

Settlement Patterns

One of the data gaps identified in the prehistoric context (Reed and Metcalf 1999) concerns settlement patterns during the Archaic Era and how people used and moved across the landscape. Paleoenvironmental models of the region in the past have suggested people utilized the lower elevations during periods of higher effective precipitation, then moved up to exploit the higher elevations during periods of drought (Reed and Metcalf 1999:172). Site 5MF6255 is located in a lower elevation setting, lying on what was the floodplain of the Yampa River during occupation of the site. Geomorphological studies and the presence of a well-developed paleosol indicate an increase in effective precipitation during the period of occupation. The occupation appears to be located at the bottom of the paleosol, coinciding with the transition from xeric to more mesic conditions (Madsen et al. 2009). Because this is one of the earliest documented basin house sites in the region, settlement patterns are vague. Two nearby sites (5MF3012, 5MF6259) each have isolated features that date to the same period as the occupation at 5MF6255, however, very little data on seasonality or function was recovered, particularly from 5MF6259 (Metcalf 2009; O'Brien and McDonald 2000b). How these isolated features relate to 5MF6255 and a possible settlement pattern is unknown, however, the contemporaneity of the dates indicates that lower elevations were being used during this transitional climatic period. These sites indicate people were moving into and exploiting these lower elevations as precipitation was increasing, supporting the settlement model of occupation in the lower elevation levels during periods of increased moisture.

The model of the Mountain Tradition, based off data gained from excavations at the Yarmony Pithouse (Metcalf and Black 1991, 1997), indicates residential Archaic populations occupied the mid-elevation ranges during the winter and exploited a wider range of elevations during the spring, summer, and fall. The pithouse was used as a storage location during these gathering times, with other occupation occurring in the field camps and other locations. While the model is based on a relatively geographically restricted area, with a wide range of resources available within only few miles of the pithouse, work in the Wyoming Basin provides support for the idea of the basin house as a storage facility for food during the productive months of the year (Larson 1997). All of this behavior post-dates 5MF6255 by at least 1000 years. The data from 5MF6255 suggests that this pattern of using the houses as food caches, for later consumption and occupation, was established earlier than previously known in the Archaic era.

Seasonality possibly indicates a late winter/early spring occupation. The high quantities of ground stone recovered suggest plant processing was a major activity here, however, the season of occupation is too early to gather plant resources. Pollen analysis on several ground stone implies grass seeds were processed, and seeds store well (Simms 1987). While no definitive storage was identified, it is possible that these houses were utilized as storage caches for seeds during the late summer when the seeds were available, then occupied during the latter part of the winter when other food resources were scarce or unavailable (Larson 1997; Metcalf and Black 1997). The ground stone could have been used during the late winter/early spring occupation to process the seeds for consumption.

Subsistence

Identifiable animal resources were dominated by leporids (cottontails and jackrabbits), although one pronghorn astragalus was recovered, as well as numerous small fragments identifiable only as medium-sized mammals. Rabbit hunting appears to have been a subsistence activity at this site, with 17 rabbits represented in the faunal assemblage. Intensity of processing is unknown, although the highly fragmented nature of the bone suggests some marrow extraction/bone grease production may have occurred.

As noted above, however, leporid bone is easily broken, with low amounts of pressure required to fracture the bone. The fragmentary bone assemblage could as easily be the result of natural, taphonomic processes as cultural processes. The highly fragmented unidentifiable medium-sized mammal bone, however, could represent bone processing.

Unlike the faunal assemblage, evidence of plant use is very limited. The results of the flotation and macrofloral analyses were sparse, with only a few charred Cheno-Am seeds recovered from two features, as well as limited quantities of sagebrush (*Artemsia* sp.) charcoal. Pollen analysis from several ground stone implements was equivocal. Grass pollen was present on several implements in quantities that were higher than that of the background pollen rain. This could indicate an economic use of grass. Several other types of economically useful plants were also present, but not in quantities higher than the background rain.

Lithic Procurement

Materials utilized for tool manufacture found at this site include Morgan-Madison and Bridger cherts, as well as Uinta Mountain quartzites. These materials, particularly Morgan-Madison cherts, are available from quarries on Juniper Mountain, which lies less than 15 km south of the site, as well as in numerous outcrops along the Yampa River, in the Sand Wash area, and Cross Mountain. Sand Wash is approximately 40 km to the northwest, and Cross Mountain is about 30 km to the west. Bridger chert formations outcrop in the Sand Wash area, Juniper Mountain, and Cross Mountain. These two chert types comprise approximately three-quarters of the debitage recovered from 5MF6255, which is consistent with the frequencies of local materials in other Archaic-age sites. Uinta Mountain Quartzites comprise 90% of the quartzites recovered from this site, although quartzite in general is rare here. These quartzites also outcrop from nearby sources, including Juniper and Cross Mountains.

Lithic Tool Technology

The tool kits at 5MF6255 appear to be composed generally of expedient flake tools with minimal patterned bifaces manufactured and used. The majority of chipped stone tools are expedient tools that were used several times, then discarded, not necessarily due to breakage. Formal tools, such as patterned bifaces, are rare and limited to five unhafted and three hafted bifaces. The unhafted bifaces tend to be tools in the earlier stages of manufacture, generally stage 3 and 4, having been shaped and thinned, but not finalized and hafted. The hafted bifaces include two diagnostic projectile points and one minimally diagnostic hafting element. The two projectile points are both medium-sized, corner-notched points, one of which is complete. The hafting element is probably from a medium-sized, corner-notched point as well. They are all roughly equivalent to the Elko series, which dates to the general Archaic. The majority of tools were made of a brown chert, with a couple of flake tools made from a brown or cream quartzite. The chert materials are the relatively local Bridger chert. The debitage assemblage is dominated by small (SG-4), interior flakes. The frequencies of the size grades indicate either stage 2 biface edging with a hard hammer or stage 2-3 biface edging and thinning with either a hard or soft hammer (Ahler 1989:92-93). Either way, later stage tool manufacture or maintenance occurred at this site.

Site Function

Based on the evidence obtained from the excavations, this site appears to have been a residential site characterized by a series of short-term occupations. There was an emphasis on the procurement and processing of floral resources, perhaps roots or tubers, although there is some evidence of grass seed processing. Most of the activity apparently took place within the houses. No exterior features were discovered, and the distributional patterns of all artifacts types, as well as bone, concentrate in and around the internal thermal pits. Activities such as tool maintenance, cooking, and consumption of animal resources occurred within the confines of the houses. The exception is plant processing; the majority of ground stone tools, especially manos, were recovered from the southern area around and above the floor of House F18.

The site was clearly reoccupied. Two features (F3, F4) internal to F17 were constructed adjacent to each other, with F3 dug nearly into F4. In addition, radiocarbon assays returned different dates for each of the floor features sampled, representing all three houses. Finally, these houses represent a significant investment in labor costs. According to Kent (1992), labor intensity in the construction of facilities such as hearths or basin houses can be used as an indicator of anticipation of return to a site. The more intensive the labor costs, the higher the probability of an intention to return to the site.

A site of short-duration usage would display certain characteristics, such as hearths, structures, lack of storage facilities, low diversity and quantities of stone tools, limited densities of debitage, a lithic assemblage that reflects late stage tool manufacture and maintenance, utilized faunal and floral resources, and little secondary refuse (Binford 1980; Metcalf and Black 1997:198). The lithic assemblage at 5MF6255 is limited and weighted towards the smaller, internal flakes indicative of late stage tool manufacture and maintenance; only eight bifaces (five unhafted, three hafted) were recovered; expedient tools (flake tools) were dominated by cutting implements with a few gravers present; little evidence of floral resources were recovered, although ground stone tools presumably used for processing these resources were ubiquitous; and the distributions of artifact densities concentrate around the internal features, reminiscent of either primary refuse or clearing activity within the houses. Features include several hearths within three basin houses, but no definitive storage features were discovered. Finally, the faunal assemblage is limited in the numbers of animals killed and consumed, not enough to keep even a small population supplied for very long. These attributes indicate the site was occupied for only short periods of time, although reoccupation clearly occurred. While the focus was on collection and processing of floral resources, possibly starchy roots or tubers, rabbits were also clearly exploited. While very little conclusive pollen evidence from the ground stone was reported and almost no charred seeds were recovered from the features, it is possible that roots were the focus of procurement activity and did not preserve in the archaeological record.

Feature Morphology

Basin Houses Three basin houses were discovered at 5MF6255, all of which were relatively small in size and fairly shallow in depth. The houses were similar to other houses discovered throughout the region, including southwestern Wyoming and northwestern Colorado (Larson and Francis 1997; Shields 1998). Houses varied in size from approximately 3.5 m to 4.0 m in diameter with regular, oval to round outlines. Depths ranged from about 20 cm to 40 cm; the measurements were obtained from the presumed natural ground around the perimeter to the deepest part of the floor, not including the floor features. These measurements are well within the range of variation of houses in the region that date to later time periods. Two of the houses (F17, F18) were somewhat circular in outline, while the third house (F15) was oval and had what appeared to be an associated extra room, the "anteroom". Shields (1998) described the possible construction method for many of the less substantial houses within the region as a result of incidental cleaning. When families returned to these houses, they would clean the interior by scooping out the debris-laden sediment, inadvertently creating a basin over time. Houses that had been deliberately excavated or dug as a single event would have more regular and symmetrical outlines and perimeters, the walls and floors would be more regular and have uniform slopes, and there would likely be berms around the perimeters of the houses (Shields 1998:81). The houses that constituted 5MF6255 appeared to have been deliberately excavated into the subsoil, particularly F15. All three houses have regular perimeters, the floors are uniform and slope with the natural paleoslope, and the walls, while shallow, tend to have a uniform slope. The exception is F15, whose northeastern wall was much deeper and steeper, having been dug into the natural slope. There was, however, no clear berming along the perimeters of this house. If there had been berms, they were leveled to the same elevation as the surrounding ground over time. The profile of F17, on the other hand (see Figure 19), clearly shows a berm on either side of the bisected house.

Only one house (F17) contained more than three internal hearths, although the fire pits within all three houses were arranged in off-center clusters. F17 contained at least four hearths and what have been interpreted as postmolds, providing the only evidence of a superstructure over the houses. These smaller pits were all located along the perimeter of F17, set within the margins of the basin by approximately 20 cm to 40 cm. No evidence of what type of support system or wall and roof coverings was recovered.

Pit Features Twelve pit features were discovered, all within the confines of the basin houses, suggestive of cold-season occupation. No features external to the houses were found. With the exception of three basin features (F2, F9, F11), all of these pits were relatively steep-sided and deeper than 10 cm. Nine of the features appear to have been utilized as hearths, likely for processing and cooking the leporids. Very little FCR was recovered from any of the pits, lithic artifacts were sparse, bone fragments were numerous, and none of the features were filled or lined with rocks that might suggest roasting pits or storage pits. Oxidation was also rare, with only one feature (F14) exhibiting oxidation around its rim. This lack of oxidation around the features suggests the hearths were either not intensively used or that the soil lacked sufficient iron to oxidize as a result of burning. Oxidation rinds can result from either a single use with high temperatures, or from numerous, lower temperature uses (Wandsnider 1997). F2, F9, and F11 were circular, shallow pits. F9 did not contain any identifiable macrofloral remains, although the highest concentration of burned rabbit bone in F18 was recovered from around this feature. It possibly functioned as either a toss pit or rabbit processing area. F2 did have four charred Cheno-Am seeds recovered from the fill, as well as a mano and slab metate fragment overlying the feature. No charcoal, macrofloral remains, or faunal remains were recovered from F11, and its function is unknown.

Postmolds Three features (F1, F6, F7) were discovered within the perimeter of F17 and located near the margins along the north side. These features were all small diameter, fairly shallow (11-14 cm), mostly regular, round to oval-shaped pits with flat bottoms and straight sides. No macrofloral remains or charcoal were recovered from the fill. They are reminiscent of postmolds and may represent a support system for a superstructure over F17, although their depth does not indicate substantial posts. Alternatively, they could have been posts on which to hang items, such as meat or hides.

Comparisons to Other Sites

A total of 52 sites in northwestern Colorado and southwestern Wyoming date to the Pioneer period, as defined in the Culture History chapter above. Of these, 25 sites are located in Colorado and 27 sites are located in Wyoming (Figure 44). Very few of these sites are single component occupations, with a few exceptions (N=17). For the most part, these sites represent short-term camps, some of which were reused over long periods of time.

The methods utilized for this aspect of the analysis were to look at all sites within the northwestern Colorado counties that make up the drainage basin of the Yampa River (Eagle, Garfield, Grand, Moffat, Rio Blanco, Routt, Summit), as well as Gunnison county since early structures have been excavated there. In Wyoming, the counties that include the physiographic Wyoming Basin (Carbon, Fremont, Sweetwater) were included. The only sites considered were those that ranged in date from 8350 to 6450 radiocarbon years BP (RCYBP), and had some level of excavation conducted, either testing or full data recovery, and had thus resulted in a report. Basin houses were noted when present, as were the morphologies of features such as overall shape (basin, deep pit, shallow pit), presence or absence of oxidation, presence or absence as well as quantity of FCR, quantity of ground stone tools, characterization of the faunal assemblage, and seasonality. Not all site reports and/or forms supplied such information, particularly the older reports,

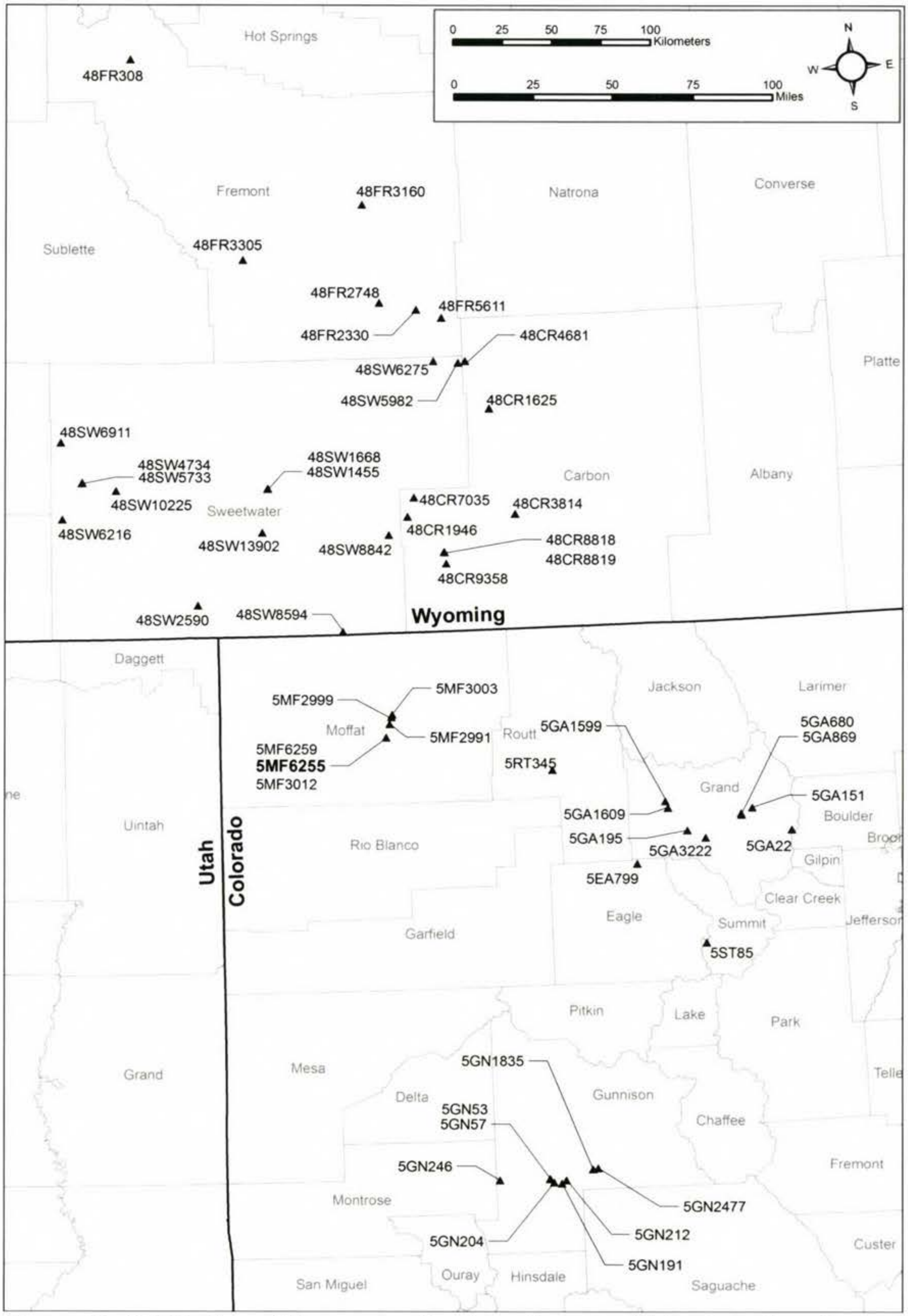


Figure 44. Distribution of Pioneer-age sites in northwestern Colorado and southwestern Wyoming

although basic morphology and descriptions of features was present for most sites. Seasonality was not always determined, mainly as a result of a lack of sufficient data. Radiocarbon dates were used to compare the sites, rather than calibrated dates as are used throughout this thesis in reference to 5MF6255. Calibrated dates were rarely supplied, and there are too many sites for which to calibrate the dates. In this section, all dates are uncalibrated unless otherwise noted as calibrated (cal).

The following Table 49 lists the sites that have components that date to the Pioneer period and for which basin houses were identified, but not necessarily associated with the Pioneer period. The dates do not correspond to analytical units or cultural components described in the excavation reports, but are merely a combination of the periods. In addition, these dates are not necessarily the only occupations at the site. No dates later than the Settled period (4550-6450 BP) were considered. Southwestern Wyoming has a different cultural chronology, best described by Thompson and Pastor (1995), although the descriptions for the different periods are very similar to those for Colorado, as are the beginning and ending dates of each period (Table 50). The advantage is that the datasets are fairly comparable, so the earliest period or phase of the Archaic period in both states cover roughly the same period in time. For this analysis, however, the chronology terms utilized in Colorado were used for all sites.

Table 49. Sites in Colorado and Wyoming with Pioneer era components and basin houses

Site No./ Name	Date (Uncalibrated) BP	Era/Period	Basin Houses Present?	Reference
5EA799/ Yarmony	**7050**	**Archaic/Pioneer**	**No**	Metcalf and Black 1991
	6030-6330	Archaic/Settled	Yes	
	4790	Archaic/Settled	No	
5EA1009	**7710-8179**	**Archaic/Pioneer**	**No**	Mosch and Watson 1993

Site No./ Name	Date (Uncalibrated) BP	Era/Period	Basin Houses Present?	Reference
5GA22	8460-9080	Paleoindian/Late Paleoindian	No	Benedict 1985
	7940-7985	**Archaic/Pioneer**	**No**	
5GA151/ Granby Site	10,045	Paleoindian/Folsom	No	Wheeler and Martin 1984
	8730	Paleoindian/Late Paleoindian	No	
	7170-7190	**Archaic/Pioneer**	**No**	
	4665-6120	Archaic/Settled	No	
5GA195/ Barger Gulch	10,470-10,770	Paleoindian/Folsom	No	Surovell et al. 2001a
	8420-9450	Paleoindian/Late Paleoindian	No	
	6880-8246	**Archaic/Pioneer**	**No**	
	4788-6003	Archaic/Settled	No	
5GA680/ Hill Horn	**7960**	**Archaic/Pioneer**	**No**	Wheeler and Martin 1984
	4400-6220	Archaic/Settled	No	
5GA869	**6910**	**Archaic/Pioneer**	**No**	Reust and Johnston 1998
	6500	Archaic/Settled	No	
5GA1599	**6790-6710**	**Archaic/Pioneer**	**No**	Harrison et al. 2000
	5260	Archaic/Settled	No	
5GA1609	10.020	Paleoindian/Folsom	No	Olsen 1995
	9900	Paleoindian/Late Paleoindian	No	
	7230-7790	**Archaic/Pioneer**	**No**	
5GA3222	**7720-8290**	**Archaic/Pioneer**	**No**	Hokanson et al. 2005
5GN53	**6820**	**Archaic/Pioneer**		Stiger 1977
5GN57	**7400**	**Archaic/Pioneer**	**No**	Stiger 1977
5GN191	8807	Paleoindian/Late Paleoindian	No	Euler and Stiger 1981
	6540-7660	**Archaic/Pioneer**	**No**	
	5430-6270	Archaic/Settled	No	
5GN204	10,094	Paleoindian/Folsom	No	Jones 1986
	7270	**Archaic/Pioneer**	**No**	
	4563-4697	Archaic/Settled	No	
5GN212	**6860**	**Archaic/Pioneer**	**No**	Stiger 1979
	6040-6210	Archaic/Settled	No	
5GN246	**7670**	**Archaic/Pioneer**	**No**	Liestman and Gilmore 1988
5GN1835/ Tenderfoot Site	**6480-7820**	**Archaic/Pioneer**	**No**	Stiger 1997
	5070-6160	Archaic/Settled	No	
5GN2477/ Mountaineer Site	8780	Paleoindian/Late Paleoindian	No	Stiger and Bjornstad 2002; Stiger 2006
	6970-8190	**Archaic/Pioneer**	**No**	
	4640-6240	Archaic/Settled	No	
5MF2991	**7310**	**Archaic/Pioneer**	**No**	Rood and McDonald 2000
	4800-5800	Archaic/Settled	Yes	
5MF2999	**6970**	**Archaic/Pioneer**	**No**	Sanders et al. 2001

Site No./ Name	Date (Uncalibrated) BP	Era/Period	Basin Houses Present?	Reference
5MF3003	**7470-8210**	**Archaic/Pioneer**	**No**	O'Brien and McDonald 2000c
	5190-6010	Archaic/Settled	No	
5MF3012	**7430**	**Archaic/Pioneer**	**No**	O'Brien and McDonald 2000b
	4610-6690	Archaic/Settled	No	
5MF6259	**7190**	**Archaic/Pioneer**	**No**	Metcalf 2009
5RT345/ Red Army Rockshelter	**7300**	**Archaic/Pioneer**	**Yes**	Pool 1997
	5170-5440	Archaic/Settled	Yes	
5ST85/ Vail Pass Camp	**6750-7320**	**Archaic/Pioneer**	**No**	Gooding 1981
	4510-4690	Archaic/Settled	No	
48CR1625	**7500**	**Archaic/Pioneer**	**No**	Merewether 1980
48CR1946	**6600**	**Archaic/Pioneer**	**No**	Sender and Schoen 1981
	5130-6270	Archaic/Pioneer	No	
48CR3814	8780-950	Paleoindian/Late Paleoindian	No	Sanders 2006
	6570-8230	**Archaic/Pioneer**	**No**	
48CR4681	**7110-7490**	**Archaic/Pioneer**	**No**	Reust et al. 1990
	4550-6050	Archaic/Settled	Yes	
48CR7035	**7020**	**Archaic/Pioneer**	**No**	Murry 2004
48CR8818	**6580-7050**	**Archaic/Pioneer**	**No**	Yerkovich 2008a
	5830	Archaic/Settled	Yes	
48CR8819	**6450**	**Archaic/Pioneer**	**No**	Yerkovich 2008b
48CR9358	**6470**	**Archaic/Pioneer**	**No**	Western Archaeological Services, Inc. 2009
48FR308/ Helen Lookingbill	10,405	Paleoindian/Folsom	No	Larson et al. 1995
	8525	Paleoindian/Late Paleoindian	No	
	7140-7360	**Archaic/Pioneer**	**No**	
	6120-6240	Archaic/Settled	No	
48FR2330// Jeffrey City	**7160**	**Archaic/Pioneer**	**Yes**	Reiss 1988
	4970-5770	Archaic/Settled	Yes	
48FR2748	**6610**	**Archaic/Pioneer**	**No**	Waitkus 1990
	6170-6180	Archaic/Settled	No	
48FR3160	**8210**	**Archaic/Pioneer**	**No**	Brown 1992
48FR3305	**6960**	**Archaic/Pioneer**	**No**	Sanders 1995
	5070-740	Archaic/Settled	No	
48FR5611	8880	Paleoindian/Late Paleoindian	No	Goodrick 2004
	7050	**Archaic/Pioneer**	**No**	
48SW1455/ Deadman Wash	**6840**	**Archaic/Pioneer**	**No**	Armitage et al. 1982
	5530-6000	Archaic/Settled	No	
48SW1668/ Tenmile Draw	**6460**	**Archaic/Pioneer**	**No**	Sall and Heffington 1981
	4940	Archaic/Settled	No	

Site No./ Name	Date (Uncalibrated) BP	Era/Period	Basin Houses Present?	Reference
48SW2590/ Maxon Ranch	**6480-7290**	**Archaic/Pioneer**	**Yes**	Harrell and McKern 1986
	4730-6000	Archaic/Settled	Yes	
48SW5733	**7440**	**Archaic/Pioneer**	**No**	Reust 1983
48SW5734/ Blue Point	**7030-8330**	**Archaic/Pioneer**	**No**	Johnson and Pastor 2003
48SW5982/ Bald Knob	**6610**	**Archaic/Pioneer**	**No**	Reust et al. 1990
	4710-5980	Archaic/Settled	Yes	
48SW6216	**6620**	**Archaic/Pioneer**	**No**	Jess and Berrigan 1986
48SW6275	**6980-8060**	**Archaic/Pioneer**	**No**	Reust et al. 1990
	6330-6380	Archaic/Settled	No	
48SW6911	**6460-7130**	**Archaic/Pioneer**	**No**	Burns 1988
	5990	Archaic/Settled	No	
48SW8594	**6940**	**Archaic/Pioneer**	**No**	Thompson 1990
48SW8842	8490-9360	Paleoindian/Late Paleoindian	No	Pool 2001
	7190	**Archaic/Pioneer**	**No**	
	5150	Archaic/Settled	No	
48SW10225	**6830**	**Archaic/Pioneer**	**No**	Talbot 1994
48SW13902	**6960**	**Archaic/Pioneer**	**No**	Stainbrook and Goodrick 2001
	5400	Archaic/Settled	No	

Table 50. Colorado and Wyoming cultural chronologies

Era	Colorado Period	Uncalibrated BP	Wyoming Phase	Uncalibrated BP
Paleoindian		Pre-8350		Pre-8500
Archaic	Pioneer	8350-6450	Great Divide	8500-6500
	Settled	6450-4550	Opal	6500-4300
	Transitional	4550-2950	Pine Spring	4300-2800
	Terminal	3150-1150	Deadman Wash	2800-1800
Formative/ Late Prehistoric	Aspen	1950-650	Uinta	1800-650
			Firehole	650-250
Protohistoric	Antero Canalla	650-70		250-130

Adapted from Reed and Metcalf 1999 and Thompson and Pastor 1995

Daub features were excavated at two sites, the Granby site (5GA151) and Hill Horn site (5GA680). The daub was discovered in concentrated areas suggestive of some sort of structure (Wheeler and Martin 1984), although these structures were not semi-subterranean basin houses as Shields (1998) defined the term. Thus, they are not considered to have had basin houses present and will not be considered further in this analysis. This, however, does not mean that residential structures were not found, such as at the Granby site (5GA151), the Hill Horn site (5GS680), or the Mountaineer site (5GN2477). It simply indicates that these structures were not basin houses.

As can be noted from Table 49 above, few sites from the Pioneer period have been investigated in either Colorado or Wyoming, although that number seems to be increasing. Only three sites had a basin house that date to the Pioneer period. One basin house site, 5RT345 (Red Army Rockshelter) pre-dates 5MF6255 by only about 100 radiocarbon years. The earliest level at the rockshelter dated to about 7300 RCYBP, which was within the lowest house discovered at the site (Pool 1997). The earliest date at 5MF6255 was 7225 RCYBP. The calibrated ranges of these two sites overlap at 2-sigma, indicating these houses were likely occupied at nearly the same time. The Red Army basin house is somewhat unusual in that it was located near the back wall of a rockshelter, which already provided good shelter from the elements. Very little information about a possible superstructure, such as postmolds, were discovered, and the interior of the house was crowded with numerous pit features, although it was unclear if these features were contemporaneous with the occupation of the house (Pool 1997).

Two other sites contain basin houses that date to the same period, the Maxon Ranch site (48SW2590) in southwestern Wyoming and the Jeffrey City site (48FR2330) in south-central Wyoming. The Maxon Ranch house was dated from 6480 to 7290 RCYBP, which overlaps the dates at 5MF6255 (Harrell and McKern 1986). The house at 48FR2330 (Jeffrey City) returned two dates ranging from 5770 to 7160 RCYBP, which overlaps the younger ages at 5MF6255 (Reiss 1990). No other early sites in either Colorado or Wyoming exhibited houses, although several sites that date to the later Settled period in both states had basin houses.

The next oldest houses in Colorado are the Yarmony houses, which date to approximately 1000 RCYBP later than 5MF6255 (Metcalf and Black 1991). This later date places the occupation of the houses at Yarmony into the early Settled period of the Archaic period. Unlike the Pioneer period occupation at either Red Army, Maxon Ranch, or the occupation at 5MF6255, Yarmony exhibits evidence of food storage and a period of occupation that lasted for a longer period at any one time, reflected in the much larger artifact assemblages. Likewise, a few of the pits at Jeffrey City (48FR2330) were interpreted as possible storage. Yarmony has a large lithic, faunal, and ground stone assemblage, while the artifacts at 5MF6255, 5RT345, 48FR2330, and 48SW2590 associated with the Pioneer-age houses are minimal. This could be a result of less actual time spent in the houses during any one visit, or possibly a diligent cleaning attempt at the earlier sites, with the midden undiscovered, although that seems unlikely at Red Army or Maxon Ranch. The three Colorado sites have been interpreted as cold season occupations, with only 5MF6255 not exhibiting much activity outside the shelter of the houses, and 48SW2590 has been interpreted as an early spring occupation, still within the cold season. No seasonality evidence was available from 48FR2330.

The remaining basin houses are all later than 5MF6255, as was noted by Shields (1998:159), with the highest incidence of basin houses occurring around 4000 RCYBP, which places them within the Settled and Transitional periods of the Archaic era.

In terms of site function, all four house sites exhibit minimal artifact assemblages, which is likely a result of short-term residential occupation. The lithic assemblages are minimal and reflect tool maintenance with minimal cobble reduction. Hunting was clearly an activity at all four sites, although at 5MF6255 it appears to be more of an embedded activity rather than the focus of activities. Leporids dominate the assemblages, although larger mammals such as deer and pronghorn are present, indicating these animals were also taken when available. The small sizes of the bone suggest heavy utilization of the bone, such as processing for marrow, particularly of the larger animal bone present. The incidence of ground stone tools is highest at 5MF6255, suggesting plant processing occurred, possibly of stored seeds, however, ground stone tools were present at the other three sites.

Interior basins at 5MF6255, 48FR2330, and 48SW2590 tend to be simple pits with a minimum of FCR present. Oxidation is minimal at 5MF6255, although it is present in greater quantities at Maxon Ranch, indicating the pits were used more intensively than at 5MF6255. At Red Army, several of the pits are either rock-filled or rock-lined with heavier oxidation present, suggestive of a more specialized pit feature as well as more intensive use. During the Pioneer period overall, pits tended to be fairly simple, with few examples of slab-lined pits present and no bell-shaped pits were reported. Likewise, most of these pits were not heavily oxidized, if at all, although at least half of the pits recorded did have FCR present within the fill, either as rock-filled hearths or roasting pits, or just a few pieces present (Table 51). Sites not included in this table had no feature information available.

Table 51. Types and attributes of pit features from Pioneer-age sites in region

Site No./Name	Feature Morphology	Oxidation	Rocks	Reference
5GA151/ Granby Site	shallow basin	present	absent	Wheeler and Martin
	deep basin	present	present	
5GA869	shallow basin	absent	absent	Reust and Johnston 1998
5GA1599	shallow basin	present	present	Harrison et al. 2000
5GA1609	shallow basin	present	absent	Olsen 1995
	shallow basin	present	present	
5GA3222	deep basin	present	absent	Hokanson et al. 2005
	stone-lined basin	present	present	
5GN1835/ Tenderfoot Site	rock-lined basin	absent	present	Stiger 1997
	roasting pit	absent	present	
	slab-lined	absent	present	
	unlined	absent	absent	
5MF2991	shallow basin	absent	absent	Rood and McDonald 2000
5MF2999	FCR cluster	absent	present	Sanders et al. 2001
5MF3003	deep basin	present	present	O'Brien and McDonald 2000c
	shallow basin	absent	present	
5MF3012	deep basin	absent	absent	O'Brien and McDonald 2000b
5MF6259	deep basin	absent	absent	Metcalf 2009
5RT345/ Red Army Rockshelter	deep basin	absent	present	Pool 1997
	rock-lined basin	present	present	
	rock-filled basin	present	present	
5ST85/ Vail Pass Camp	shallow basin	absent	present	Gooding 1981
48CR8818	deep basin	absent	absent	Yerkovich 2008a
48CR8819	shallow basin	absent	absent	Yerkovich 2008b
48FR2330/ Jeffrey City	deep basin	absent	absent	Reiss 1988
48FR3160	deep basin	absent	absent	Brown 1992
48FR5611	shallow basin	absent	absent	Goodrick 2004
48SW1455/ Deadman Wash	shallow basin	absent	absent	Armitage et al. 1982
48SW2590/ Maxon Ranch	shallow basin	absent	present	Harrell and McKern 1986
	deep basin	present	present	
48SW6911	deep basin	present	present	Burns 1988
48SW8594	deep basin	absent	absent	Thompson 1990
48SW8842	deep basin	absent	absent	Pool 2001
	slab-lined	present	present	
48SW10225	basin	absent	present	Talbot 1994

Site No./Name	Feature Morphology	Oxidation	Rocks	Reference
48SW13902	shallow basin	absent	present	Stainbrook and Goodrick 2001

Based on the artifact assemblages and presumed seasonality, these early Pioneer-era house sites were likely utilized as short-term residences during the cold seasons, late winter to early spring. Internal pits tended to lack oxidation, whether from these house sites or from Pioneer-era sites in general, indicating the features were not intensively utilized. Later features from the same sites that exhibit oxidation indicate that lack of iron in the sediments is not the cause for the absence of oxidation around these pits. Another possibility is the use of fuel wood. At 5GA1609, Olsen noted the lack of oxidation around hearths that used sagebrush for the fuel wood, while the pits that utilized wood were oxidized. Olsen speculated that since sagebrush burns less intensely than wood does, this could explain the lack of oxidation rather than hearths that had not been intensively utilized (1995:16). At any rate, the investment in time and labor to construct these pits, many of which were deep albeit simple, indicates that the occupants intended to either stay long enough to gain a return on their labor investment, or to return to the same location in the future. The presence of the houses suggests the latter.

SUMMARY

The data gained from the excavation of site 5MF6255 fills in several gaps in our knowledge of the Pioneer period of the Archaic era, as outlined in this chapter. Sites that date to this period are rare in the region. Of the 184 sites that meet the criteria outlined above (dates between 4550-10,950 uncal BP, within northwestern Colorado and southwestern Wyoming), 5MF6255 is one of 53 sites that date to the Pioneer period and one of four sites that contain basin houses. The information provided by 5MF6255 allows us to describe a little more fully the adaptations of this early time period and establish a few traits that appear to be characteristic of the Pioneer period.

Chronologically, 5MF6255 falls in the middle of the defined Pioneer period. The adaptation of constructing and utilizing basin houses was an established practice by this time, which suggests that its origins occur much earlier in time, probably as a natural evolution of the patterns already noted in the Late Paleoindian era (Johnson and Pastor 2003; Stiger 2006; Wheeler and Martin 1984). These Archaic structures, particularly the ones that date to the later Settled and Transitional periods, were utilized as a type of large scale storage as a strategy to survive the winter months, according to one of the proposed models (Larson and Francis 1997; Larson 1997; Metcalf and Black 1991, 1997). It is likely that 5MF6255, like the three other Pioneer-age house sites, represents an earlier but established manifestation of this strategy. Three of the house sites, including 5MF6255, were occupied during the cold season, in the late winter to early spring. This strategy appears to have been a response to the temporal and spatial availability of food resources (Bamforth 1997) as the climatic conditions of the early Holocene became drier and warmer and food resources became patchier.

The faunal assemblage at 5MF6255 is dominated by leporids, with minimal evidence of the exploitation of larger mammals, such as pronghorn or deer. This is similar to many of the other Pioneer period sites in the region, as well as some of the Late Paleoindian sites, such as 4SW5734, the Blue Point site. The faunal assemblage of the Late Paleoindian component at this site was also dominated by leporids, suggesting the change to the broad-based subsistence pattern observed at 5MF6255 was practiced earlier in time (Johnson and Pastor 2003).

In addition to the focus on smaller mammals, there was also an apparent focus on exploitation of floral resources, noted by the large assemblage of milling implements at 5MF6255. Pollen analysis of several metates and a mano show elevated levels of grass pollen from the background pollen rain, suggesting grass was processed with these tools, but very little floral materials were recovered from the fill of the features. These milling implements were clearly utilized, but what specific plants were used is not known. Other Pioneer-age sites in the region also had significant amounts of ground stone tools, but not in the same proportion as at 5MF6255. At this site, the milling implements make up 62% of the tool assemblage.

The lithic technology, like many of the other Archaic-age sites, is dominated by local raw materials. In addition, most of the chipped stone tools are flake tools that were heavily utilized. I believe this was a result of the late season of occupation of the site and the inability of the inhabitants to access fresh material.

Finally, pit features appear to have a consistent morphology throughout the Pioneer period. All of the pits at 5MF6255 are simple basins with minimal FCR and oxidation, suggesting they were not intensively utilized or used for stone boiling. Overall, the pattern from other Pioneer-age sites in the region indicates pit features were typically these same types of simple basins. Few pits exhibited oxidation and a few were slab-lined. Macrofloral analysis of the fill from these features was similarly largely void of charred floral remains, making inferences about what plant species were utilized difficult.

In sum, the characteristics of the Pioneer period include the construction of basin houses with occupation in the cold season; an emphasis on smaller mammals, particularly leporids; a focus on floral resources that required increased processing as noted by the increase in milling implements present on Pioneer-age sites; and construction of simple basins rather than more elaborate, slab-lined, rock-lined, or rock-filled pits. The houses at 5MF6255 were apparently built as one event, indicating the knowledge and processes by which to construct them were already established, forcing us to reconsider just how early the change to the broad-based subsistence and strategic mobility patterns prevalent in the Archaic occurred.

CHAPTER 10: DISCUSSION AND CONCLUSIONS

DISCUSSION

Results of excavation at 5MF6255 indicate that the site was a residential base occupied for short periods of time over a period of approximately 300-400 years in the Pioneer period of the Archaic era. Radiocarbon assays of charcoal from subfloor features within the houses place occupation of the site between 7794 and 8170 years BP (calibrated). These are the extreme ranges for the intercept dates from the samples. More likely, the houses were occupied consecutively, and the pattern observed is the result of at least five different occupations.

F18 appears to have been the first house occupied. Construction of this house may have been more incidental, with the basin shape forming as the result of cleaning the interior of the prior years' cultural and natural debris. There appears to have been an expectation of reoccupation for this house; the only two complete slab metates were located in and around F8, both of which were discovered use-facet down. This house was apparently not occupied multiple times, with only three deep thermal pits and one shallow basin present within its margins. A prehistoric drainage channel cut west and downslope through the west wall of the house and partially destroyed F8 in the process. It is possible that the basin, as a low spot in the immediate vicinity, filled with water during periods of abandonment, which then breached the west wall. This drainage is a shallow rill on the east side of the house, which then deepened and became more pronounced within the house as the drainage flowed west. This natural destruction of the west wall may have led to the abandonment of the house, although not of the location. The area continued to be used as a processing area for floral resources, although which floral resources are unknown. The highest concentration of ground stone at this site was from north and west of F18, as well as above it.

As stated above, F18 may have been the result of incidental cleaning rather than purposeful construction. The southern wall, which was the only one clearly defined, followed the natural topography of the paleoslope and did not appear to have been cut into the slope. If there had been a berm, it was either trampled to the natural ground level during occupation, or was missed during excavation. The presence and period of occurrence of the drainage channel is also problematic. It was identified at the base of excavation, and was visible in the profile of the trench and in the west wall profile of the excavation block. The paleosol and cultural sediments lay above the channel and followed its topography, indicating that the drainage predated most of the occupation at the site. If the drainage was present prior to the initial occupation, then it is unlikely the people would have constructed a house that straddled the channel. On the other hand, F8 was partially destroyed by the drainage, indicating that the occupation of this area was before the formation of the channel, although apparently it did not form post-occupation either. If it had, then a scatter of artifacts along the drainage would be expected as it carried artifacts from the house downslope. Artifact distributions show that the southwestern portion of the excavation block was mostly devoid of artifacts, although they could have been carried further downstream and beyond the area excavated.

F17 was the second house to be constructed and occupied, based on the radiocarbon dates. It was also the most intensively utilized, with the highest number of features within the margins of the house, as well as limited evidence of some sort of support structure. This intensive use was more likely the result of one or more occupations over a number of years rather than fewer, longer-term occupations. The near superposition of F3 into the sidewall of F4 provides evidence of the reoccupation of this house.

Subsequent to the abandonment of F17, F15 was excavated into the nearby slope and occupied. At this time, both F17 and F18 were likely abandoned. There is no overlap of the radiocarbon dates for the two earlier houses and this third house. F15 differed from the other two houses in its shape (oval vs. round) and the presence of a second room, the "anteroom", located to its south. Also, there were only two large pits within the interior of the main room and one within the "anteroom". In addition, there was some ambiguous evidence of a structure. Along the northeast wall was an area of oxidation that extended approximately 50 cm along the wall and about 30 cm down the wall. A shallow depression was located in the floor just below this oxidation stain. This may suggest a support beam that burned, then fell against the wall, creating the oxidation, although this is pure speculation.

It is also possible that the "anteroom" represents a fourth house that preceded the excavation and occupation of F15. Charcoal from F16 within the interior of the "anteroom" dates this shallow basin to a slightly earlier time than F15, closer to the occupation and use of F18. Considering the very close proximity of the two basins, however, it is unlikely that they were occupied at the same time. In addition, the orientation of the "anteroom" reflects that of F15 more closely than either F17 or F18, both of which were generally round and oriented closer to the cardinal directions than either F15 or the "anteroom". The morphology of the "anteroom" suggests it was more likely attached as a second room to F15, possibly preceding it but related to it.

Ultimately, the functions of the houses all appear to be similar. The results of the artifact analysis and mapping of the distributions show activity areas concentrated within the houses, suggestive of use during cold weather. The highest density of lithics and bone were concentrated around the interior features. The lithic assemblage for each house is similar, with small, interior chert flakes dominant, suggestive of tool maintenance. The area between the houses was smeared with charcoal and low quantities of lithics, bone, and flake tools, but otherwise relatively clean. No features suggestive of an outside activity were found in this area. The distribution patterns of the artifacts are more reminiscent of loci of activity rather than debris deposits. No secondary deposits, such as middens, were discovered, although the F17 basin may have been used for this purpose after it was finally abandoned. F18 appeared to be the house with a specialized function, with the highest concentration of ground stone artifacts recovered in and around the basin. It was likely a processing area for some plant resource, possibly roots or grass.

Pit features were all internal to the houses. Most were thermal pits, likely hearths used for cooking or processing plant and faunal materials. It is unlikely that they were used as roasting pits or ovens. There was very little rock recovered from the features, and few charred seeds. Bone was recovered in higher quantities, suggesting the pits were used to process the ubiquitous rabbits. Storage pits were not present.

Overall, the densities, quantities, and diversity of artifacts are low. Fewer than 800 pieces of lithic debitage were recovered and are dominated by small, tertiary flakes indicative of later stage tool manufacture or maintenance. Very few larger flakes were recovered, which may have been a result of intensive use of available material. Flaked stone tools are limited in quantity and dominated by expedient flake tools. The majority of the edges identified on these tools were used for cutting activities, with gravers on a few edges. The intensive use of these expedient tools is also suggestive of conservation of materials, with the available tools heavily used. These low quantities and diversity of tools indicates short-term occupations.

Unlike the stone artifacts, the faunal assemblage is fairly large, with over 8,000 pieces of bone recovered. Unfortunately, the bone is highly fragmented, with only half of the fragments included in the faunal analysis due to a lack of diagnostic elements. The majority of the assemblage represents several rodents, as well as leporids (cottontail, jackrabbit). Rodents include chipmunk, ground squirrels, a prairie dog, pocket gophers, mice, woodrat, and voles. The rodents are likely intrusive to the site. None were burned and few had any carbonates clinging to the bone, despite the high quantities in the sediment. Approximately half of the rabbit bones have been burned and were found in and around the thermal features, indicative of processing. Whether the bones were processed for marrow extraction or bone grease as well is unknown. Rabbit bones are highly susceptible to fracture from taphonomic processes. If the assemblage does represent intense processing of the rabbits for bone marrow/grease extraction, it could suggest a late winter/early spring occupation. Bone marrow is high in fat, which is especially important for its high caloric value, particularly in colder climates (Binford

1978) and when animals are otherwise incredibly lean (Outram 2002), such as late in the winter. Only five cottontail rabbits and 12 jackrabbits, for a total of 17 rabbits, are represented by the assemblage, another indicator of short-term usage of the site.

The results of the macrofloral and pollen analyses were limited. Few charred seeds and small amounts of charcoal were recovered from the features. All identifiable charcoal was identified as sagebrush (*Artemisia* sp.), which is currently available on the slopes surrounding the site. The charred seeds were identified as Cheno-Am, known to have been used ethnographically. The plants also produce abundant small seeds and grow in disturbed areas, such as human habitations (Weber 1976:73, 111). The presence of the charred seeds in two features from F17 suggests these plants may have been processed and cooked for food. Alternatively, seeds could have been deposited on an individual, who then walked into the house and inadvertently redeposited the seeds in the fire. Cheno-Ams produce thousands of tiny seeds and should be present in higher frequencies in the feature fill had they been used for subsistence. On the other hand, these features may have been cleared and the original fill removed, with the last use of the features as hearths prior to abandonment.

Pollen analysis of five ground stone artifacts and two soil control samples indicated little difference between the types and amounts of pollen present on the ground stone and in the control samples. Ten different pollen types were observed, several of which have economic importance. Their presence on the ground stone could indicate these plants, present in the area, were processed. Of note were the elevated quantities of grass pollen on the ground stone in relation to the background pollen rain. While there is no additional evidence (such as macrobotanical remains) to suggest any of these economically important plants were processed, the absence of seeds or other material does not necessarily indicate these plants were not processed with these tools.

Lipid and fatty acid residue analysis from one of the two pieces of FCR submitted resulted in the identification of isomers and acids typical in processing meat and seeds or nuts. The FCR was recovered from the floor of F15 approximately 1 m east of F10, although it is unknown if it is from this feature where the sample originated. Whichever feature it was in, that feature was utilized to process both meat and seeds or nuts. The meat was from a large herbivore, possibly pronghorn, although the seeds or nuts are unknown. Specific acids indicate the presence of conifer products, although no coniferous charcoal was identified from the floats. Conifer wood could have been used in the hearth and simply did not preserve. Pollen analysis identified pine pollen in both soil control samples and from the ground stone wash, however, pine pollen is transportable over long distances.

Results of the macrobotanical, pollen, and fatty acid residue analyses indicate that at least three of the features (F2, F3, F10) were utilized for cooking food products. The distribution of burned bone indicates that F2 and F10 were also utilized for processing rabbits, as well as F9, the shallow pit located along the southwestern margin of F18. In fact, the highest quantities of burned bone, particularly cottontail rabbit, recovered from F18 were associated with F9. The resources used include Cheno-Ams, grasses, seeds and/or nuts, at least one large herbivore, and 17 rabbits. While the pollen analysis reported good preservation and adequate sample size, the flotation of the feature fill for macrobotanical analysis returned largely negative results. Few charred seeds were recovered, and small amounts charcoal despite observation of abundant quantities of charcoal bits during excavation. It is possible that the charcoal did not preserve well and disintegrated during flotation processing. On the other hand, Jones (2009) reported that pollen preservation was good.

Obsidian sourcing indicates ties to southwestern Idaho, either as individual travelers or possibly traders. Only one piece of obsidian was recovered, and no tools or large flakes were found. This could indicate cultural affinity to the north and west, with the single flake representing a symbolic connection (Craig Lee, personal communication, 2009).

While the season of occupation for this site is questionable, it was clearly a residential site and not a field camp. Occupations were multiple, short-duration, and seasonal and lasted periodically for over 300 years. None of the pits were identified as storage, which are features more commonly found on later Archaic sites (Larson 1997). The faunal assemblage represents a very limited number of small animals, which would not be enough food to maintain a small population for very long. The artifacts are limited in quantity and diversity, also indicators of shorter term occupations. A few domestic artifacts, such as a bone awl and possible game pieces, were recovered, however, domestic items have not been recovered in large quantities from other houses in the region (Larson 1997). The high intensity use of the flake tools suggests conservation of materials, which occurs when the supply of tool stone materials starts to get low and access to the resource is restricted. Although a source of material is less than 15 km south of the site, it is at a higher elevation and subjected to freezing temperatures and deeper snow later in the spring than the lower elevations, such as the river bottom where 5MF6255 was situated at the time of occupation. Access to these sources would be extremely limited in the late winter/early spring. The results of the macrofloral analysis of fill from all features were minimal. Few charred Cheno-Am seeds were recovered, and considering the high quantities of seeds these plants produce, as well as the size of the seeds, it is unlikely that the features were utilized for processing Cheno-Am seeds, although these food plants were apparently used.

Neither animal nor seed processing appears to have been a focus of activity at this site, although some sort of plant processing did occur. Ground stone are the most common type of stone tool recovered, with the highest concentrations located in the southern portion of the site, particularly around and above F18. Pollen analysis of six milling implements suggests grasses may have been processed with these tools, although no evidence of charred grass seeds or materials were recovered from the flotation. It is possible that the ground stone tools were used to process roots, and the edible yampa root is common in the area. While hunting was clearly an embedded activity here, along with the maintenance of tools associated with hunting and meat processing such as bifaces and utilized flakes, it was not the main focus of the occupation. Few hunting and animal processing artifacts were found, such as projectile points and scrapers, although most of the flake tools were used as cutting implements.

CONCLUSION

The research design for this site was concentrated on discovering if this site could answer questions about adaptive continuity and change from the Late Paleoindian era through the Pioneer period of the Archaic era. The Late Paleoindian era has limited and equivocal evidence of structures, while 5MF6255 clearly had three basin houses, suggesting more effort was given to building more substantial shelters, although there is little evidence from this site that occupations were particularly long in duration. Lithic materials on Paleoindian sites tend to be more exotic and high quality types. Close to three-quarters of the lithic material at 5MF6255 was identified as local materials. Lithic material sources act as a proxy for the size of an exploited territory, with people expected to encounter these sources during their seasonal migrations. Therefore, Paleoindian territories were apparently quite large, with contractions in territories occurring later in the period. By the time 5MF6255 was occupied, the seasonal migrational territory had contracted to a few tens of kilometers squared. Utilizing lithic sources as a proxy of migration and territorial size, however, does not take into account trade. One obsidian flake sourced to southeastern Idaho was recovered from this site, although it is unlikely that the people's migration path took them all the way up to Idaho. Its presence at the site is potentially due to trade with other groups, or possibly even the result of an individual traveler. While the Paleoindian period is considered to be a time of wide-ranging big-game hunters, the evidence from the Rocky Mountains suggests they focused on smaller game as much, if not more, than the larger game, they relied more on local sources of lithic material, and there was an increasing focus on plant resources towards the end of the era (Pitblado 2003; Reed and Metcalf 1999:68-69; Surovell et al. 2001a). The results of 5MF6255 indicate this trend continued, with an emphasis on plant processing and procurement of small game. Similarly, the occupation appears to have consisted of several short-term occupations over a period of centuries with an emphasis on a broad-based subsistence. It is not possible to comment on the use of storage at this period in time. No storage pits were discovered at 5MF6255, although such features, as well as a midden and/or exterior hearths could be present and outside of the area excavated.

This site answers some of the basic questions about the Pioneer period posed in the Prehistoric Context (Reed and Metcalf 1999), such as subsistence and settlement, questions about chronology, feature morphology, lithic technology, and site function. By 8000 years ago, the occupants of northwestern Colorado were likely following a seasonal schedule based on availability of plant foods. Floral resources were clearly important, as demonstrated by the high frequency of ground stone recovered from this site, although which plants in particular were utilized is unclear.

Hunting was also clearly an important activity, although the focus was more on small game than larger ones. At least one large artiodactyl, possibly a pronghorn, was processed in the vicinity of F18, so the inhabitants were not completely reliant on leporids. Comparisons with other sites in the area of the same age support this supposition, that there was an increased reliance on smaller game, with leporids dominating most faunal assemblages.

An effort was made to construct residences that were more substantial than those that had apparently been utilized in the previous era. This investment in building both residential structures and pit features indicates an intent to return to the locale. People were not staying at these early houses for long periods, however, they were reoccupying them over long periods of time. The climate during the initial occupations of 5MF6255 was apparently warm and dry, with a period following that was much cooler and moister. These houses were likely a response to this climatic variability and the attendant variability in the availability of food resources. As has been speculated elsewhere

(Larson 1997), these houses could be a response to the uncertainty of timing of resource availability, functioning as larger scale storage for the lean cold months.

This site likely represents a palimpsest, with the occupations of the houses occurring consecutively over time, most likely by a single family group. What we found was the result of several different occupations superimposed on a single location on the landscape. The dates from these houses suggest their location would have been within the living memory of the group, hence the reason the houses were built so near each other.

Group size was probably not very large, about four or five people per occupation. These houses were all small, with little activity apparently taking place outside the shelter of the structures. More than five people would have created very crowded conditions, particularly if the group was essentially confined to spending much of their time indoors. Additionally, sleeping quarters would have been cramped even with five people. The minimum number of rabbits was also limited in number to 17 for the entire span of occupation. Although the remains of at least one medium-sized mammal were also recovered, the focus of hunting activity was apparently on leporids. These low numbers would not have fed many people for very long, even with supplementing the animal protein with floral resources.

The area was possibly chosen for periodic occupation because of the presence of early spring roots, although the proximity of a lithic source near the top of Juniper Mountain should also be considered. The Spring Creek valley was heavily utilized in the later Settled period by possibly the same affinal group, also constructing and occupying basin houses. It is possible that the movement of game animals drew people to this location. As a lower elevation corridor with ready access to water, it would provide a good travel corridor for both people and animals. Following this corridor is a fairly easy path into southwestern Wyoming, which is possibly where the residents traveled to during their seasonal rounds. The presence of a diagnostic hafted biface recovered from 5MF6255 that is strikingly similar to a hafted biface recovered from a similarly dated occupation at 48SW8842 in south-central Wyoming suggests a connection between the two sites. Finally, this valley may not have represented a special location for occupation. It appears to be heavily occupied, with a high site density, largely because of the three pipelines that run through the valley. Without the construction of the pipelines and the legal obligations imposed by federal law, the buried sites discovered along Spring Creek and Deception Creek to the south would be unknown. It is possible that adjacent valleys were utilized as heavily, but without the unique opportunity to view the subsurface provided by the long trenches for the pipelines, any buried prehistoric occupations of these valleys will remain unknown.

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APPENDIX A

Geoarchaeological Assessments

5MF6255

By

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Objectives and Methodologies

This report is designed to provide MAC archeologists with site-specific geoarchaeological assessments and baseline data for the WIC-REX geoarchaeological report. Two avenues of inquiry are followed. The first is a terrain reconnaissance to define the site's physical setting. The second documents soil and sediment characteristics. Both inquiries assess:

1) Site age(s),
2) Depositional histories,
3) Artifact integrities,
4) Potential to yield buried cultural materials,
5) Relevance to the WIC-REX research designs, and
6) The site's relationship to the CIG-UBL regional model (Metcalf and McFaul 2005)

Methods of terrain reconnaissance follow classic techniques of Gilbert (1877) and others (Soil Survey Division Staff 1993; Way 1978) modified for geoarchaeology (McFaul 1990; McFaul and Doering 2003; McFaul et al. 1994; Smith and McFaul 1997). Descriptions of the sediments and soils follow Birkeland (1999). Geoarchaeological interpretations are based upon my 33 years of experience and those of others (Waters 1992). Classic (Hansen 1986) and revisionist (Metcalf and McFaul 2005) regional studies also influenced my interpretations.

Results

Physiography

Archaeological site 5MF6255 is in the Yampa River drainage approximately 0.29 miles upstream of the Spring Creek-Yampa River confluence (Figure 1). This segment of the ROW

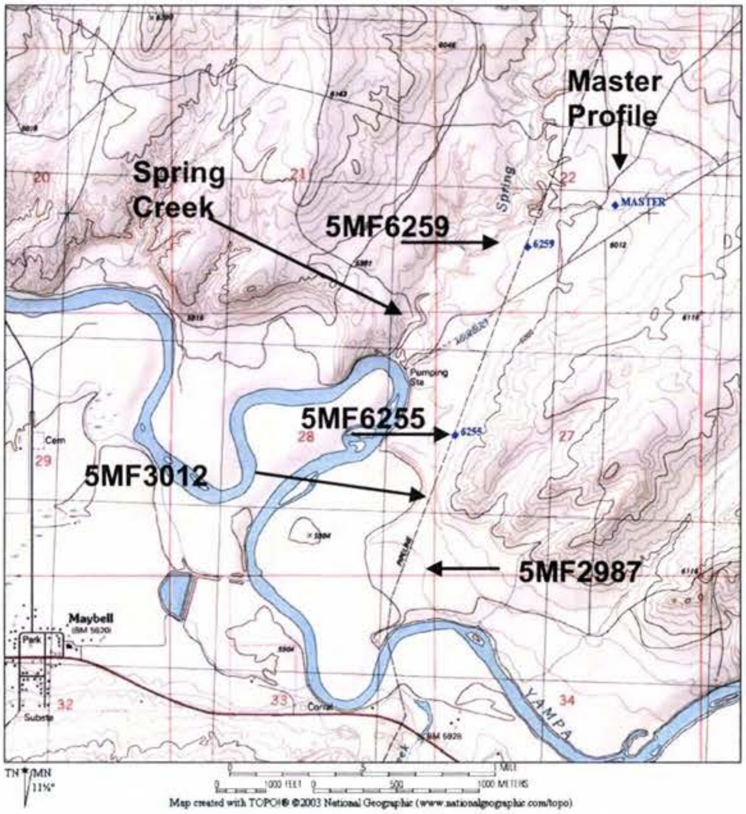
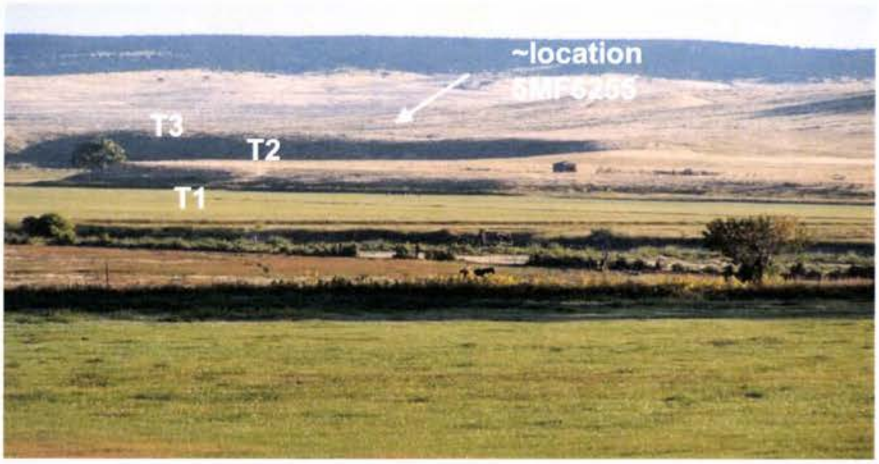


Figure 1: Yampa River-Spring Creek topographic map in vicinity of 5MF6255, 5MF6559, 5MF2987, 5MF3012, and the Master Profile. Maybell lower left.

is within the informally named Yampa River physiographic sub-section which extends from the dunes south of US 40 north to the Eagle Rock Gap (McFaul 2009).

Site 5MF6255 is located on a Yampa River T3 alluvial terrace near the foot of a slope (Cover photo) cut into Tertiary Browns Park Formation bedrock (Tweto 1979). Terrace T3 is part of a stair-step like suite of abandoned Yampa River alluvial floodplains (Photo 2). T3 alluvium is considered a late Pleistocene-early Holocene fill corresponding with T3 alluvium dating > 8860 BP at the Master Profile in U^{238} Draw and T3 alluvium dating $\geq$6690 BP at nearby 5MF3012 (Photo 2).

Photo 1: Yampa River terraces, view northward from US 40, note three terraces. Undulations in T3 surface due to eolian dune sand. 5MF6255 on T3 behind and north of eolian lip dune.



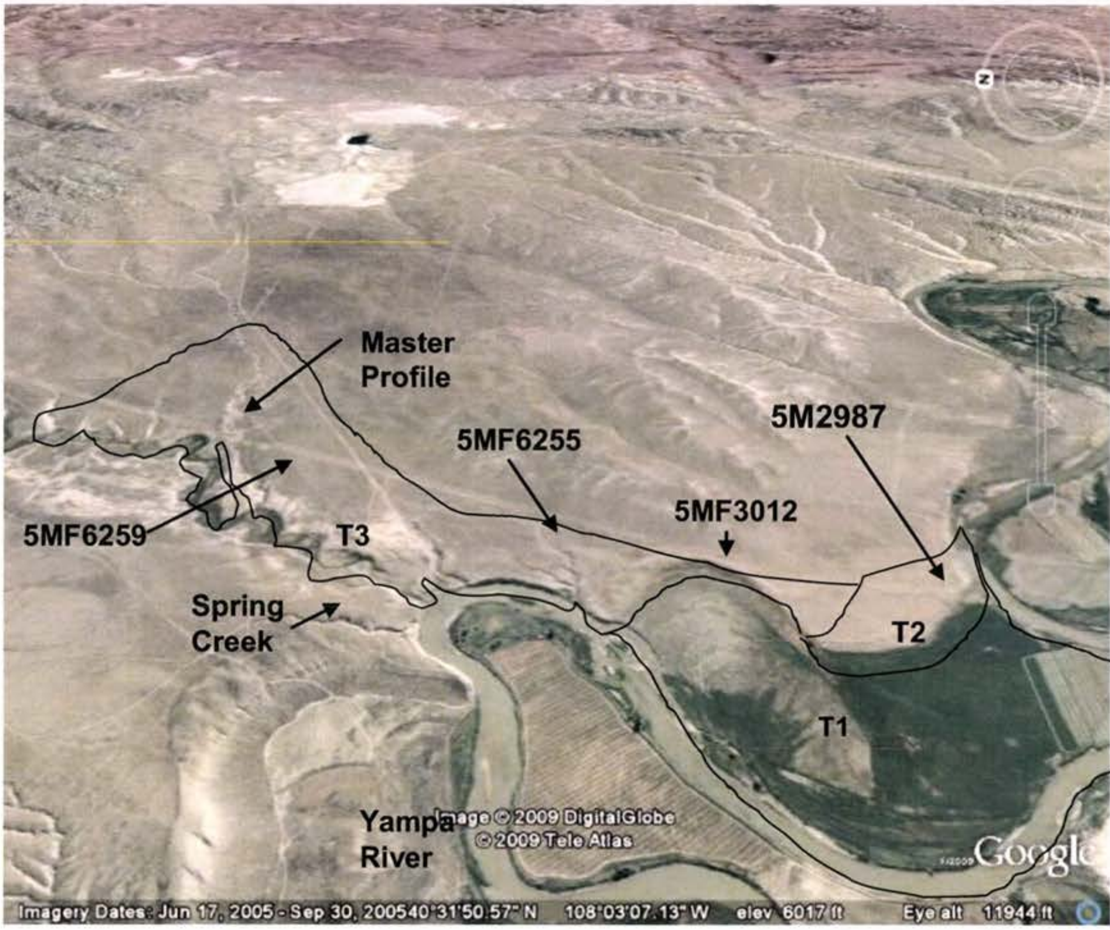


Photo 2: Google Earth image of Yampa River/Spring Creek confluence with approximate locations of 5MF6255 and other sites on terrace T3. Approximate extent of Terraces T1, T2, and T3 outlined

Based upon dated soil/sediment contexts from at 5MF3012 on terrace T3 and 5MF2987 on terrace T2 the following is the CIG-UBL chronology for Yampa River terrace creation:

- Yampa occupied the higher elevation T3 floodplain though 6690 BP,
- After 6690 BP the Yampa abandons its T3 floodplain downcuts to a new lower elevation,
- T2 fill begin accumulation in the in the newly incised channel,
- By 3470 BP T2 aggradation ended and renewed downcutting occurred,
- T1 begins filling the newly incised Yampa River channel,
- Eolian deposition on T3 began by ~4610 BP and prior to 3470 BP on the T2.

5MF3012 and 5MF2987 results also establish terraces T2 and T3 have the potential to yield buried cultural materials. Cultural materials at 5MF6255 are preserved within the basal eolian sand mantling terrace T3.

Site-Specific Properties

One representative profile was described at 5MF6255 in the main block at 150-148N/200E (Photo 3 and Figure 2). Three eolian units were exposed below disturbed surface sediments in the described wall. The oldest unit, eolian I is defined by the Ab>Abk and Bkb horizons of a complex buried paleosol. Horizon Bkb is a light gray (10YR7/2) colored, coarse-grained, well-sorted, slightly hard (~2.0 gr/cm^2), massive, and calcareous sand. This violently effervescent horizon is enriched with many (40%), fine, irregular shaped, segrated carbonate filaments. Dark gray (10YR4/1) horizon Ab>Abk is also violently effervescent with many (70%) fine irregular segrated carbonate filaments. Carbonate enrichment has nearly plugged horizon Ab>Abk.

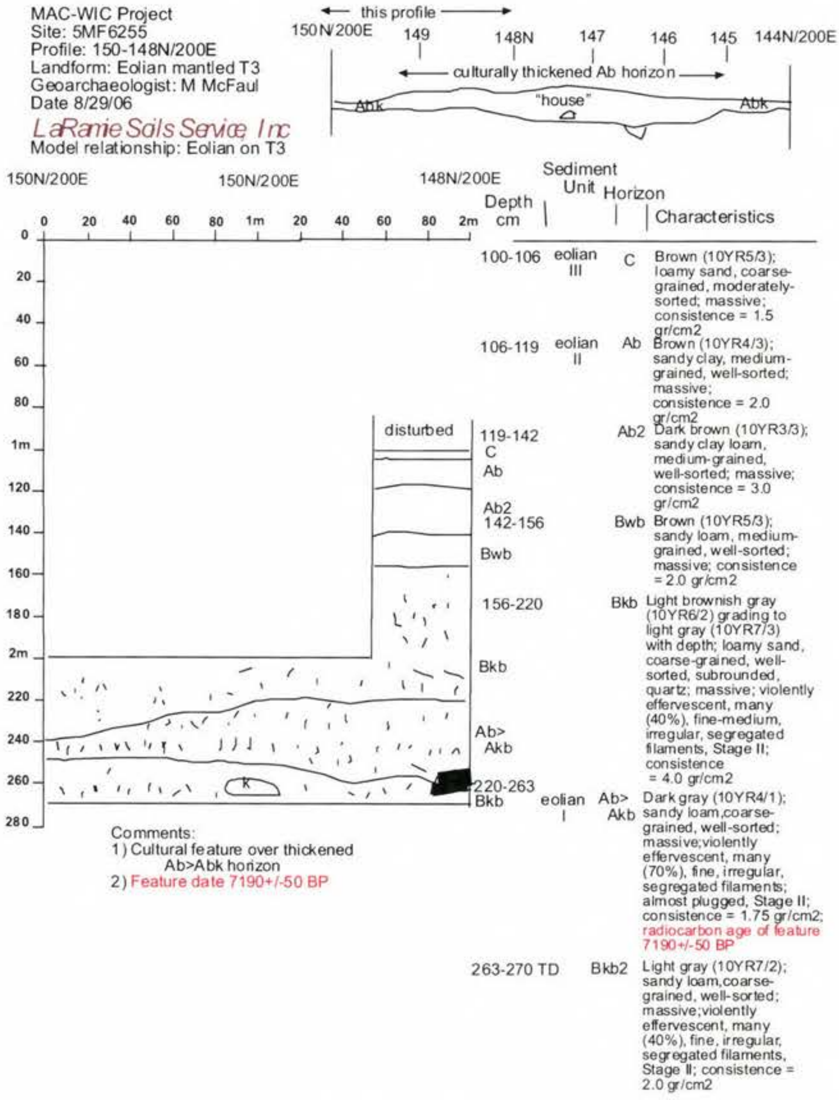
Photo 3: Profiled wall of main block east of the pipe. Note dark cultural horizon thins toward the margin of the excavation block (photo right).

Ab>Abk

Carbonates enrichment in eolian I equal a Stage II accumulation (Gile et al. 1966). Relative age-dating of such accumulations suggests eolian I sands date > 4000 (Karlstrom 1988) or >5000 (Guile et al. 1966) years old. My personal confidence in carbonate relative age-dating is high for the Yampa River physiographic subsection. This subsection yielded four dated Stage II carbonate accumulations. Two stacked Stage II accumulations at the Master Profile dating 9770 BP and 8860 BP and two others at 5MF3012 dating 7430 BP and 6960 BP. All of these ages corroborate Gile et al. (1966) and Karlstrom's (1988) >4000 to 5000 year old minimal age for Stage II accumulations.

Soil A horizon development and subsurface carbonate enrichment represents mutually exclusive soil forming environments. Organic rich and acidic A horizons develop at the surface under mesic soil environments where as carbonates are basic subsurface salts that accumulate under xeric soil conditions. Simply stated, these mutually exclusive soil characteristics together with carbonate relative age-dating suggest eolian I a relatively old Holocene deposit. Traced laterally horizon Ab>Abk has a lensed or saucer-like appearance through the pit feature. Radiocarbon dating of cultural charcoal in the lensed segment of the horizon returned an age of 7190 +/-50 BP.

Figure 3: Profiled wall 5MF6255. Note association of cultural materials and horizon Ab>Abk



Eolian II is a ~114 cm thick, well-sorted, medium to coarse-grained, slightly hard to hard, and massive sand. Similar to eolian I, it also is defined by a calcareous, buried paleosol with Ab/Ab2/Bwb/Bkb horizons. Carbonate in horizon Bkb equals a Stage II suggesting eolian II dates > 4000 (Karlstrom 1988) or >5000 (Guile et al. 1966) years old. Immediately above eolian II and below the disturbed surface is eolian III. It is coarse-grained, moderately-sorted, friable, massive sand that lacks evidence of soil development. Cultural materials are absent in eolian II and eolian III.

Geoarchaeology and Paleoenvironments

The oldest environment event recognized at 5MF6255 is the deposition of eolian I (Table 1). We know eolian I is an early Holocene event because cultural material in it

Table 1

Proposed 5MF6255 environmental events		
Event	Environment	Evidence
	xeric	coarse-grained, moderately-sorted eolian III sand
paleosol	mesic	calcareous paleosol with carbonate enrichment of eolian I
		paleosol >4000-5000 years ago
eolian II	xeric	coarse-medium grained- eolian II sand
paleosol	mesic	paleosol (7190 BP)
eolian I	xeric	coarse to medium-grained eolian sand >7190 BP

radiocarbon dates 7190 BP. The position of this date, pedologic (soil) characteristics and geologic properties of the eolian I;

- affirms the early Holocene age for eolian I,
- implies occupation of 5MF6255 during a mesic soil forming environment,
- indicates eolian I has the potential to yield Pioneer Period and possibly older cultural materials dating >7190 BP,
- shows the need to expand the CIG-UBL chronology for eolian deposition on the T3 by > 2580 radiocarbon years,
- suggests, at least, discontinuous eolian deposition on the T3 prior to its abandonment ~6690 BP, and

- although ~110 radiocarbon years younger, hints eolian I and its paleosol correspond with Metcalf and McFaul's (2005:14) ~8490-7300 BP sediment event 2 (figure 4).

Development of the eolian I paleosol was followed by a second period of eolian deposition and subsequent paleosol development. Such occurrences suggest a xeric climatic swing followed by mesic conditions favoring soil development. Carbonate relative age-dating suggests eolian II occurred > 4000 (Karlstrom 1988) or >5000 (Guile et al. 1966) years ago and implies eolian II has the potential to yield Pioneer and Settled Period cultural material. Metcalf and McFaul (2005) note two sediment events, numbers 3 and 4 within the range of 7190 BP to ~4000 years ago (Figure 4). Based upon the complexity, abundance, and similarity to other dated paleosols in Spring Creek (McFaul 2009:14-15), I feel it is likely eolian II represents the xeric (5800-4600 BP) and mesic (4600-3400 BP) climatic conditions associated with ~5800-3400 BP sediment event 4.

The age eolian III at 5MF6255 is unknown. Due to construction disturbance we were unable to associate eolian III with any of the proposed five sediment events occurring after 3400 BP (Metcalf and McFaul 2005:15-16)

Finally, the sandy textures associated with the eolian units at 5MF6255 indicate depositional energies of insufficient strength to alter any but the smallest artifact integrities. Eolian deposits are also capable of burying and strategically separating individual components and occupations. The absolute age of the basal eolian unit shows all of the exposed eolian deposits at 5MF6276 have the potential to yield buried cultural materials.

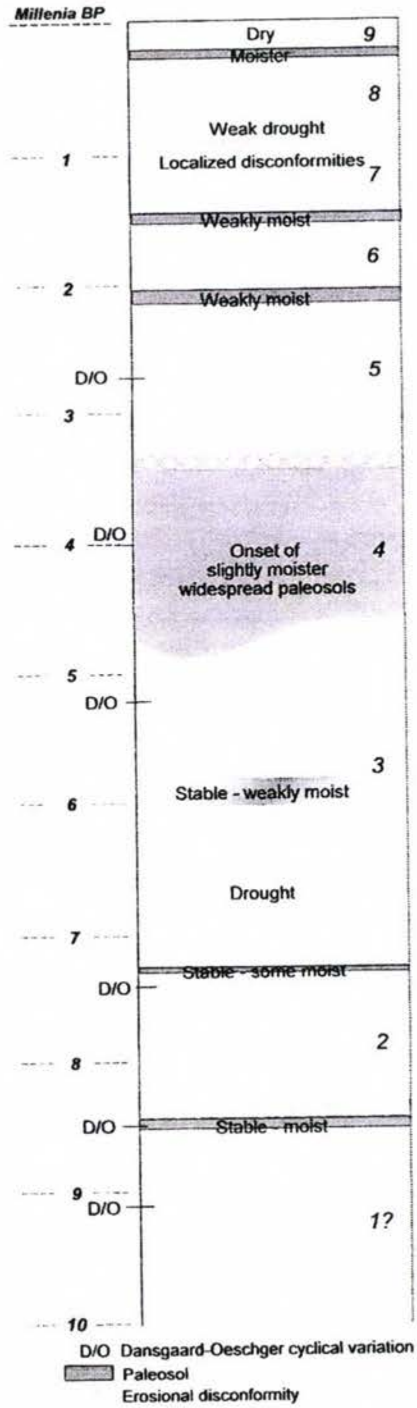


Figure 4: Metcalf and McFaul (2005:14) CIG-UBL paleo-environmental model. Note: 5 events dating <3600 BP.

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APPENDIX B

Analysis of Pollen Samples from Moffat and Rio Blanco Counties Colorado, and Sweetwater County, Wyoming: The Wyoming Interstate Company Piceance Basin Expansion Project

(edited from larger study)

by

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Analysis of Pollen Samples from Moffat and Rio Blanco Counties Colorado, and Sweetwater County, Wyoming: The Wyoming Interstate Company Piceance Basin Expansion Project

by

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A total of 49 samples were analyzed for fossil pollen content for Metcalf Archaeological Consultants, as part of a mitigation project associated with the construction of Wyoming Interstate Company's Piceance Basin Expansion pipeline in Moffat and Rio Blanco Counties in northwestern Colorado and Sweetwater County in southwestern Wyoming. Pollen samples examined for this project include 32 ground stone artifact washes and 17 associated sediment samples. It was anticipated that a detailed examination of fossil pollen preserved on the ground stone artifacts might offer some insights into past human/plant interactions in this poorly studied region. Proveniences of the Piceance project sediment samples are provided in Table 1. Samples were selected for analysis based on their secure stratigraphic provenience and the likelihood of the pollen offering information on past human activities.

Methodology

Recognizing that the environmental conditions in northwestern Colorado and southwestern Wyoming are generally not favorable for pollen production, a conservative pollen extraction technique was followed. Pollen is an organic compound and although very durable, is susceptible to bacterial, fungal and mechanical degradation. Natural cycles of wetting and drying produce an environment favorable for the growth of pollen-destroying bacteria and fungi. Under these conditions, pollen grains are likely to have suffered some adverse affects, and thus would be expected to be present, if at all, in a weakened state of preservation. With this fact in mind, weaker bases and acids were selected for use in extraction, particularly involving those chemicals which have been documented to act harshly towards poorly preserved fossil grains.

The Piceance pollen samples were first quantified (5mls), placed in sterile beakers, and a known quantity of exotic tracer spores was added to each sample. Here, Danish clubmoss (*Lycopodium clavatum)* spores were chosen as an exotic, because these spores are unlikely to be

Table 1
Proveniences of Pollen Wash and sediment Samples from the Piceance Project

Lab No.	Sample No.	Site	Provenience
12	13	5MF6255	147.32N/200.02E, 184-189cmBD, FS#300, metate
13	16	5MF6255	142N/203E, 155-162cmBD, FS#580, metate
14	17	5MF6255	142N/203E, 166-171cmBD, FS#583, metate
21	82	5MF6255	Control Associated with Samples 13, 16, 17
32	12	5MF6255	145.46N/204.09E, 148-157cmBD, FS#487, metate
33	14	5MF6255	147.38N/199.97E, 190-196cmBD, FS#67, mano
49	92	5MF6255	Control Associated with Sample 14

found in the actual fossil pollen assemblages from this region. Tracer spores are added to samples for two reasons: First, by adding a known quantity of exotic spores to a known quantity of sediment, fossil pollen concentration values can be calculated. Second, in the event that no fossil pollen is observed in the sediment sample, the presence of *Lycopodium* tracer spores verifies that processor error was not a factor in the pollen loss. Since a known or standardized volume of sediment was not collected from each pollen wash, concentration values could not be calculated. The presence of tracer spores, however, verifies that pollen was not inadvertently lost from these samples during processing.

Following the addition of the tracer spores, the samples were washed with 10% Hydrochloric Acid. This step removed carbonates and dissolved the bonding agent in the tracer spore tablets. The samples were then rinsed in distilled water, sieved through 150 micron mesh screens, and swirled to remove the larger and heavier particles. Next the samples were consolidated, and 50% Hydrofluoric Acid was added to the residues to remove unwanted silicates. After the silicates had been removed, the residues were rinsed thoroughly, and were then washed in 1% KOH to remove alkaline soluble humates.

Next, the samples were dehydrated in Glacial Acetic Acid, and were subjected to an acetolysis treatment (Erdtman 1960) consisting of 9 parts Acetic Anhydride to 1 part concentrated Sulfuric Acid. During this process, the samples were placed in a heating block for a period of 8 minutes. This step removed most unwanted organic traces including cellulose, hemi-cellulose, lipids and proteins, and converted these materials to water-soluble humates. The samples were then rinsed in distilled water until a neutral pH was achieved.

Following this treatment, the samples were next subjected to a heavy density separation using Zinc Chloride (Sp.G. 2.00). Here, the lighter organic fraction was isolated from the heavier minerals. After this treatment, the lighter pollen and organic remains were collected and rinsed thoroughly in water. The residues were then dehydrated in absolute alcohol, and transferred to a glycerine medium for curation in glass vials.

Permanent slides were prepared using glycerine as a mounting medium, and identifications were made on a Nikon compound stereomicroscope at 400x magnification. Identifications were confirmed by using the Palynology Laboratory's extensive pollen reference collection. Minimum 200-grain counts, standard among most palynologists (Barkeley 1934), were made for each sample when pollen was preserved in the sediments. Pollen counts of 200 grains are thought to be fairly reflective of past vegetation and paleoenvironmental conditions.

Concentration values were calculated for all sediment samples. Hall (1981) and Bryant and Hall (1993) note that concentration values below 2,500 grains/ml of sediment may not be well reflective of past conditions, and usually record a differentially preserved assemblage. As a result, counts with low concentration values should be viewed with caution.

Results

A total of 49 pollen samples were examined for the Piceance project, representing pollen washes and associated sediment control samples associated with the ground stone artifacts. Pollen preservation was highly variable in the samples and ranged from good to abysmal. Pollen counts were achieved in 48 samples (98%), while a single pollen wash sample from site 5MF3006 contained an insufficient amount of pollen to allow 200+ grain statistically valid counts to be achieved. Concentration values were likewise variable, reflecting the general preservation of the fossil pollen, and ranged from near zero to 31,355 grains/ml of sediment. Generally, however, preservation was poor, indicative of differentially preserved assemblages.

Table 2
Pollen Taxons Identified in the Piceance Project Samples

Taxon	Common Name
Non-Arboreal	
Apiaceae	Parsley or Umbel Family
Artemisia	Sagebrush
Asteraceae High Spine	Sunflower type
Asteraceae Low Spine	Ragweed type
Cirsium	Thistle
Liguliflorae	Dandelion Group
Brassicaceae	Mustard Family
Caryophyllaceae	Pink Family
Cheno-Am	Goosefoot, Pigweed
Convolvulaceae	Morning Glory Family
Cyperaceae	Sedge Family
Ephedra	Mormon Tea, Joint Fir
Eriogonum	Desert Buckwheat
Fabaceae	Bean or Legume Family
Geraniaceae	Cranesbill Family
Liliaceae	Lily Family
Nyctaginaceae	Four O'Clock Family
Onagraceae	Evening Primrose Family
Sarcobatus-type	Greasewood type
Platyopuntia	Prickly Pear
Poaceae	Grass Family
Polemoniaceae	Phlox Family
Polygonaceae	Knotweed Family
Polygonum	Knotweed
Rosaceae	Rose Family
Solanaceae	Nightshade Family
Verbenaceae	Vervain Family
Zea mays	Maize
Arboreal	
Alnus	Alder
Celtis	Hackberry
Cornus	Dogwood, Bunchberry
Juniperus	Juniper
Picea	Spruce
Pinus	Pine
Prunus	Chokecherry
Pseudotsuga	Douglas Fir

Quercus	Oak
Rhamnaceae	Buckthorn Family
Rhus	Sumac, poison Ivy
Salix	Willow
Sambucus	Elderberry
Indeterminate	Too Poorly Preserved to Identify

Taxons

A minimum of 42 different taxons was noted in the Piceance pollen samples (see Table 2). While many of these species represent normal background "pollen rain," a number of taxons were noted which reflect economic plants or potential economic plants cultivated or utilized by the sites' inhabitants. Before drawing interpretations on the presence and abundance of specific taxa, it is important to understand some of the factors influencing the occurrence of these taxa in the pollen sediment and ground stone tool samples, including pollen production, dispersion and preservation.

<u>Apiaceae</u>

Pollen grains from the Parsley Family were rare in the Piceance samples, and identification of these grains below the family level is usually not possible. This family possesses a number of mostly Old World economic species, including carrot, parsley, dill, caraway and ornamentals including Queen Anne's lace. Native North American members of this family tend to favor moist forest floors and streamsides. Apiaceae pollen is dispersed by insects, and its occurrence in pollen samples in appreciable quantities may signal an economic usage.

<u>*Artemisia*</u>

Pollen from sagebrush was a dominant type in the Piceance samples, and reflects the general abundance of this plant in the pipeline area. Pollen from this plant is generally insect-pollinated, but its grains are also dispersed by the wind, and the plant produces large quantities of pollen which are commonly encountered in archaeological sediments. *Artemisia* pollen is durable and readily recognizable even when degraded, thus in regions where these plants occur, *Artemisia* pollen tends to be over-represented in poorly preserved pollen assemblages.

<u>Asteraceae</u>

Pollen from members of the Asteraceae (Compositae or Composite) family can usually be separated into a subfamily based on the grain's diagnostic morphology. In addition to the above-mentioned *Artemisia*, members of this family that are readily recognized include *Cirsium* (thistle) type, Liguliflorae (dandelion or chicory) type, and both high and low spine Asteraceae types.

Insect pollinated members of this group, the high-spine Asteraceae types, are poorly represented in the Piceance pollen assemblages, despite their general abundance in the region. Members of the *Cirsium* and *Liguliflorae* group likely represent background weeds. The high spine Asteraceae group encompasses many genera including *Aster* (aster) and *Helianthus* (sunflower). While sunflower is a potentially important cultivated plant, the generally low occurrence of its pollen argues against its use as an important food source in the area.

Grains from low spine Asteraceae, being wind-pollinated, are produced in very large numbers and are dispersed over large areas. Two of the most important members of this group include *Ambrosia* (ragweed) and *Solidago* (goldenrod). These grains also tend to be over-represented in poorly preserved assemblages as their morphology makes them readily recognizable even when highly degraded.

Brassicaceae

Pollen from the Brassicaceae or mustard family is commonly encountered in archaeological sediment samples. A number of important cultivated plants of Old World origin are represented in this family, including broccoli, cauliflower, Brussel sprouts, cabbage, radish, mustard and rapeseed. Several native members of this family also have economic value, including *Lepidium* and *Descurainia*. However, a large number of naturally occurring weeds are also represented by this family, thus the presence of Brassicaceae pollen does not necessarily indicate an economic usage of these plant. Despite the fact that members of this family are insect pollinated and are relatively low pollen producers, the sheer abundance of these plants usually allows for at least a few Brassicaceae grains to occur in most archaeological samples.

Caryophyllaceae

Plants in the Caryophyllaceae or pink family are insect pollinated, however their pollen grains are occasionally encountered in archaeological sediments due to their durability and recognizable morphology. Most members of this family have no economic value, although a few members are cultivated for their ornamental flowers, including carnations and *Dianthus*.

Cheno-Am

Cheno-Am pollen, representing plants in the Chenopodiaceae family and in the genus *Amaranthus* in the Amaranthaceae family are among the most commonly encountered grains in North America. The reason for this pollen type's abundance is that the grains are generally produced in large numbers, are readily dispersed by the wind, are extremely durable, and are readily recognizable even when degraded. Many members of the Cheno-Am group are disturbance indicators, favoring farmland and cleared areas around human habitation. In the southwest, Cheno-Ams, especially *Chenopodium* and *Amaranthus*, have been cultivated by humans and serve as important food sources. Old World domesticated members of this family include beets (*Beta vulgaris*) and spinach (*Spinacia oleracea*).

Cyperaceae

Sedge and rush pollen grains are generally considered to be fairly fragile, thus these grains are usually found in sediments that exhibit exceptional pollen preservation. Rushes and sedges are most commonly encountered in perennially moist environments such as wet meadows, bogs and ponds. Abandoned pit structures that retain water may create an environment favorable to the growth of some sedges. A number of sedges have economic value for their edible fruits or caryopses, as well as a source of fiber for basketry, matting and other weavings. It is also possible that the Cyperaceae pollen in the Piceance samples represents background weeds.

Fabaceae

Members of the Fabaceae include the pulses and clovers as well as other arboreal and non-arboreal species. These grains are usually insect- or self pollinating, and for the most part, their pollen is infrequently encountered in archaeological sediment samples. Economic members of this family found in the American west include kidney and tepary beans (*Phaseolus spp.*). The presence of significant quantities of pollen from this family may indicate the economic use of a member of this important family, but generic-level identification is problematic.

Ephedra spp.

Two distinct forms of *Ephedra* (Mormon tea or joint fir) were identified in the pollen record; *E. nevadensis* and *E. torreyana* types. These pollen types are recognizable based on their distinctive surface morphologies. However, as *Ephedra* produces copious quantities of durable and readily recognizable pollen which is capable of traveling great distances, little attention has been paid to the various types of *Ephedra* pollen noted in the Piceance pollen samples. Moerman (1998) and Yanofsky (1936) record several instances where *Ephedra* has been used as a food or medicine.

Polygonaceae, *Eriogonum* and *Polygonum*

Pollen from the knotweed family was noted in several samples, and identifications to the generic level of *Eriogonum* (wild- or desert-buckwheat) were frequently possible. *Eriogonum* is a widespread plant found in a number of habitats throughout the southwest. Both seeds and stems of this plant have been widely used as a food in the region (Moerman 1998). Many species of *Polygonum* favor disturbed habitats including abandoned gardens and fields and waste places, while other species prefer moist environments. Most members of the Polygonaceae family are insect pollinated, however, many are also facultatively wind pollinated, thus pollen from these plants are routinely encountered in archaeological sediments.

Liliaceae and *Yucca*

Liliaceae pollen is strictly insect-pollinated, and its grains are infrequently encountered in archaeological sediments. A large number of mostly Old World economic plants are represented in the lily family, including *Allium* (onion, garlic, leek), *Asparagus* (asparagus), *Lilium* (lily), *Trillium* (trillium), *Tulipa* (tulip), *Agapanthus* (Africa lily), *Hyacinthus* (hyacinth) and *Muscari* (grape hyacinth). Native economic members of this family include *Camassia* (camas) and *Allium* (wild onion). *Yucca* (yucca or Spanish dagger) is an important member of this family, whose pollen, under ideal circumstances, can usually be recognized based on its distinctive surface patterns. As these grains are all scarce in the pollen record, the presence of more than a few grains in a sample may indicate economic activity.

Nyctaginaceae

Pollen grains from *Boerhaavia*-type (spiderling), as in many genera in the family Nyctaginaceae are thick, durable and readily recognizable, even when degraded. Thus, despite the general scarcity of these plants, Nyctaginaceae pollen tends to be an over-represented, but still scarce component in differentially preserved pollen assemblages. Large numbers of Nyctaginaceae pollen likely indicate a differentially preserved pollen assemblage.

Platyopuntia

Pollen from the genus *Opuntia* in the family Cactaceae can usually be separated into two distinct sub-genera; *Cylindropuntia* (cholla cactus) and *Platyopuntia* (prickly pear cactus). These grains are large, heavy and are produced in low numbers, thus they rarely travel far from their source. As a number of members of these groups have economic value for both food and fiber, the occurrence of prickly pear pollen grains may signal the prehistoric utilization of these important plants.

Poaceae, Cerealea, *Zea mays*

All grasses are wind pollinated and produce large amounts of distinctive pollen, thus these grains generally make up a significant proportion of most pollen assemblages.

However, the morphology of grass pollen does not allow for the identification below the family level, with the exception of cultivated Old World grains (Cerealea, including wheat [*Triticum*], barley [*Hordeum*], rye [*Secale*] and oats [*Avena*]), and *Zea mays* (corn or maize). The domestication process has led to a significant enlargement of the pollen grains in these genera. In the case of maize, a New World domesticated Panicoid grass, unique micro-morphological features of the pollen grain allow for a positive specific identification of this important plant. Other native grass genera, some of which were economically important, unfortunately cannot be identified based on their pollen. High percentages of grass pollen, particularly on grinding stone surfaces likely indicate that grasses were processed on these stones.

<u>Rosaceae</u>

Pollen from the insect pollinated rose family is actually fairly common in archaeological assemblages, probably due largely to the sheer abundance of the various members of this family. The grains are fairly fragile and diagnostic morphological features are easily lost, thus many eroded grains from this family can only be identified at the family level.

<u>*Sarcobatus*-type</u>

Pollen from *Sarcobatus*-type includes grains from greasewood and pickleweed (*Allenrolfea*). These grains are produced in great abundance and are durable and distinctive, thus they are frequently a common component in archaeological pollen samples. Significant quantities of *Sarcobatus*-type pollen may indicate the deliberate processing of one of these plants, as both have known economic value (Moerman 1998).

Solanaceae

Pollen from the Nightshade Family is rare in archaeological samples as the grains are produced in low numbers and are poorly dispersed. A number of economically important members of this family are known, including *Solanum* (nightshade, potato, eggplant), *Capsicum* (chili peppers), *Physalis* (ground cherry, tomatillo), *Lycium* (wolfberry) and numerous ornamentals.

Miscellaneous herbs

A number of the Piceance project herbaceous pollen types are identifiable only to the family level, including Convolvulaceae, Geraniaceae, Onagraceae, Polemoniaceae, and Verbenaceae. While economics and ornamentals have representatives in all of these families, each also has native weedy representatives as well, thus a claim for a definitive economic usage cannot be made based on the presence of low numbers of these grains. Because all of these families are insect-pollinated, they produce relatively low amounts of pollen, thus their pollen is scarce in the archaeological record. These types were rare in the Piceance Pipeline samples.

Alnus

Alder pollen is durable, produced in large numbers, and is readily dispersed over great distances by the wind. As such, alder pollen is a commonly encountered pollen type in sediment samples throughout much of the New World.

Celtis

Pollen from hackberry is insect pollinated, thus is produced in low numbers. These distinctive grains are fairly durable and readily recognizable, thus tend to occur in archaeological sediment samples with some frequency. Hackberries have been widely utilized as a food resource (Moerman 1998) throughout the United States. However, its pollen would not necessarily be expected to occur in areas where hackberry fruits were processed.

Cornus

Several species of *Cornus* (dogwood, bunchberry) are known from Colorado and Wyoming, although these plants have limited economic value. These plants are insect pollinated and produce low amounts of poorly dispersed pollen. The presence of this grain in most archaeological samples is not to be expected, and generally little economic or paleoenvironmental significance is attached to this grain's occurrence unless encountered in large percentages.

Juniperus

The category TCT consists of pollen grains in the families Taxodiaceae (bald cypress family), Cupressaceae (cypress family) and from the genus *Thuja* (arborvitae). Grains from this group are difficult to identify beyond this grouping, even when perfectly preserved, thus palynologists group these cryptic grains into one large category. In the Piceance sediment samples, most of our grains are likely to be from *Juniperus* spp. (juniper), although long-distance transport of *Thuja* or *Sequoia* is also possible. All of these plants produce copious amounts of readily dispersed pollen, and TCT pollen is among the most common pollen types encountered throughout most of North America.

Picea

Pollen from spruce is large and distinctive, and this buoyant pollen can readily travel significant distances from its source in the higher elevations of the local mountains.

Because of this, although spruce trees don't generally occur at the elevations at which the Piceance sites occur, small amounts of its pollen should be expected.

Pinus

Pine pollen is among the most commonly encountered grains in North American sediment samples, as pine pollen is abundant, widely dispersed, readily recognizable even when highly degraded, and is very durable. Like spruce, pine pollen grains possess buoyant bladders that aid in the grain's dispersal thus they tend to travel great distances. Pine pollen can often be separated into sub-genera based on micro-morphological features. However, these features can usually be seen only on perfectly preserved grains. Pines occurring in the Piceance pipeline project area include whitebark pine (*Pinus albicaulis*), pinyon pine (*Pinus edulis*), lodgepole pine (*Pinus contorta*) and ponderosa pine (*Pinus ponderosa*).

Prunus

The distinctive pollen from *Prunus* is uncommon in archaeological sediment samples as the grains are produced in low numbers and are dispersed by insects, thus rarely traveling far from the tree. Only one member of this genus is native to the region; *Prunus virginiana* (chokecherry). As this plant produces edible fruit, the occurrence of significant quantities of its distinctive pollen in sediments or on grinding surfaces may indicate the prehistoric use of this species.

Pseudotsuga

Pollen from douglas fir (*Pseudotsuga menziesii*) is often scarce in archaeological sediments for several reasons. First, the grains are large and despite relying on wind for transport, rarely travel any appreciable distance from the tree. Douglas fir pollen is also fairly fragile and thus is not often preserved in sediments exhibiting any degree of degradation. Finally, the grains, unless perfectly preserved, are often easily mistaken for ubiquitous fungal spores, as they lack diagnostic features. The presence of *Pseudotsuga* grains usually indicates these trees were present near the sampling location.

Quercus

Oak pollen is produced in large quantities, and is durable and distinctive, thus is commonly encountered in archaeological sediments. As these grains can travel great distances, the presence of a few grains might be expected in archaeological samples, even if located some distance from oak habitat.

Rhamnaceae

Pollen from the Buckthorn family is diagnostic, but usually uncommon in archaeological samples. Members of this family include *Rhamnus* (buckthorn), *Ceanothus* (redroot) and *Condalia* (squaw bush). Members of this family have little economic significance in the New World, but the presence of these grains may be important paleoenvironmental indicators.

Rhus

Pollen from *Rhus* (sumac or poison ivy) in the Anacardiaceae or sumac family was noted rarely in the Piceance samples. Although generally insect pollinated, *Rhus* grains are very distinctive and are fairly commonly encountered in archaeological sediments. As sumac or squawbush was an important source of food or beverage by native populations, the presence of significant quantities of *Rhus* pollen may indicate the ancient use of this potentially important plant.

Salix

Willow pollen is a commonly encountered pollen type, as the grains are abundant and widely dispersed. The grains are readily recognizable, but are not particularly durable. Willows generally prefer moist habitats.

Sambucus

Pollen from *Sambucus* (elder or elderberry) is an uncommon but potentially significant find in archaeological assemblages. These grains are insect pollinated and are thus produced in low numbers. When well preserved, these grains can be diagnostic and may signal the past use of this important plant. *Sambucus cerulea* (blue elder) occurs in northwestern Colorado and is the likely source of these grains. Elias (1980) reports that this species has been used for its edible fruit and its pithy stems have been used to make musical instruments.

Indeterminate

In every pollen sample, a number of grains were noted which were distorted, folded, eroded, crumpled or in some other way unidentifiable. These poorly preserved grains were placed into the category indeterminate. Statistical calculations were made in consideration of this group.

Pollen Counts

Tables 3 through 12 contain pollen counts and percentages from the Piceance project samples. When preservation was acceptable and it seemed evident that a pollen count could be made, a minimum of 200 fossil grains was counted. This often meant examining multiple slides until 200 grains were found. In the event that pollen preservation was poor and that counts could not be achieved, an effort was made to count at least 75 exotic *Lycopodium* tracer spores to allow for the calculation of concentration values where possible.

Table 9
Pollen Counts and Percentages from Site 5MF6255

	Sample			
Taxon	**12**	**13**	**14**	**21**
Artemisia	78 (38.6)	90 (45.0)	60 (30.0)	86 (42.8)
Asteraceae High Spine				1 (0.5)
Asteraceae Low Spine	43 (21.3)	47 (23.5)	41 (20.5)	39 (19.4)
Cirsium		1 (0.5)		
Liguliflorae				
Brassicaceae				
Caryophyllaceae				1 (0.5)
Cheno-Am	28 (13.9)	22 (11.0)	26 (13.0)	32 (15.9)
Cyperaceae				
Ephedra	1 (0.5)		1 (0.5)	1 (0.5)
Eriogonum				1 (0.5)
Fabaceae				
Liliaceae				
Sarcobatus-type	2 (1.0)	2 (1.0)	3 (1.5)	2 (1.0)
Platyopuntia				1 (0.5)
Poaceae	12 (5.9)	9 (4.5)	10 (5.0)	5 (2.5)
Polemoniaceae				
Polygonaceae				
Polygonum			2 (1.0)	
Rosaceae				
Zea mays				
Alnus				
Juniperus	15 (7.4)	12 (6.0)	15 (7.5)	14 (7.0)
Picea			1 (0.5)	
Pinus	13 (6.4)	8 (4.0)	34 (17.0)	6 (3.0)
Prunus				
Quercus	1 (0.5)	3 (1.5)	3 (1.5)	5 (2.5)
Salix				
Sambucus				1 (0.5)
Indeterminate	9 (4.5)	6 (3.0)	4 (2.0)	6 (3.0)
Total	**202 (100)**	**200 (100)**	**200 (100)**	**201 (100)**
Pollen Concentration (Grains/ml of sediment)	*	*	*	**14,614**

Table 9, Contd.
Pollen Counts and Percentages from Site 5MF6255

	Sample		
Taxon	**32**	**33**	**49**
Artemisia	95 (47.5)	71 (35.5)	70 (35.0)
Asteraceae High Spine			1 (0.5)
Asteraceae Low Spine	45 (22.5)	25 (12.5)	36 (18.0)
Cirsium			
Liguliflorae			
Brassicaceae		1 (0.5)	
Caryophyllaceae			
Cheno-Am	27 (13.5)	60 (30.0)	51 (25.5)
Cyperaceae			
Ephedra	1 (0.5)		
Eriogonum	2 (1.0)	2 (1.0)	3 (1.5)
Fabaceae			
Liliaceae			
Sarcobatus-type	3 (1.5)	6 (3.0)	2 (1.0)
Platyopuntia	1 (0.5)		
Poaceae	3 (1.5)	8 (4.0)	3 (1.5)
Polemoniaceae			
Polygonaceae	1 (0.5)	3 (1.5)	2 (1.0)
Polygonum			
Rosaceae			
Zea mays			
Alnus			
Juniperus	10 (5.0)	8 (4.0)	16 (8.0)
Picea			
Pinus	7 (3.5)	6 (3.0)	9 (4.5)
Prunus			
Quercus		2 (1.0)	1 (0.5)
Salix			1 (0.5)
Sambucus			
Indeterminate	5 (2.5)	8 (4.0)	5 (2.5)
Total	**200 (100)**	**200 (100)**	**200 (100)**
Pollen Concentration (Grains/ml of sediment)	*	*	**8432**

Discussion

As a whole, preservation in the Piceance pollen wash and sediment samples was generally poor to fair, with concentration values ranging from near zero to 31,355 fossil grains/ml of sediment. Despite the poor preservation of the fossil grains in these samples, pollen counts were achieved in 48 of the 49 samples.

The poor preservation at the Piceance project sites is due to the extreme oxidizing conditions in the area, resulting in the differential loss of fragile pollen grains. Interpretations, thus, must be made with caution as the ancient pollen grains found are certainly not the only grains that were originally present on the ground stone surfaces or in the sediments. Still, valuable information can be gained as the identified grains represent taxons that were present in the site area in the past.

In all cases for both the pollen washes and the sediment samples, a suite of pollen types dominates the assemblages, including *Artemisia*, low spine Asteraceae, Cheno-Ams, Poaceae, *Juniperus* and *Pinus*. These taxons have several things in common: They are all produced in abundance and are an important part of the regional pollen flora. All of these types are wind pollinated and are produced in copious quantities as they rely on chance to be transported to an awaiting flower. These types are also very durable, containing relatively high amounts of sporopollenin, the lignin-like compound responsible for pollen's durability. Finally these types all possess unique shapes and morphologies making them easily recognizable, even when heavily degraded. Together, these factors account for the over-representation of these groups in the western United States, and these groups account for the majority of grains identified in the Piceance project samples.

It is perhaps most useful to present the Piceance pollen findings on a site by site basis, discussing the samples, pollen associated with these samples, and possible interpretations.

MF6255

This site, overlooking the Yampa River, lies on an older terrace beneath a thick overburden of fine-grained sand and clay colluviums. Artifacts at the site pre-date 7190 BP, placing the site within the Pioneer Period of the Early Archaic Period. A total of seven pollen samples from 5MF6255 were examined, including five pollen washes (four metates and a mano), and two associated sediment samples. Pollen counts and proveniences are presented in Table 9. Preservation was fair at this site, and concentration values ranged from 8432 to 14,614 fossil grains/ml of sediment. Preservation at this site might have been somewhat enhanced by the deep layer of overburden covering the site, somewhat mitigating the oxidizing conditions of the area.

Pollen samples were dominated by the over-represented *Artemisia*, low spine Asteraceae, Cheno-Ams, Poaceae, *Juniperus* and *Pinus*. Background taxons identified in the pollen assemblages include *Ephedra*, *Sarcobatus*-type, *Picea*, *Quercus* and *Salix*. Less commonly encountered insect-pollinated types identified in the assemblages include *Cirsium* and high spine Asteraceae, Brassicaceae, Caryophyllaceae, *Eriogonum*, *Platyopuntia*, *Polygonum* and Polygonaceae, and *Sambucus*. While most of this latter group represents normal pollen flora for the region, potential economic value may be attributed to some of the taxons. Brassicaceae, *Eriogonum*, *Platyopuntia*, *Polygonum* and *Sambucus* all have appreciable economic worth, both for foods and in some cases as medicines. While none of these taxons occurs in numbers of more than a few grains per sample, it is possible that they represent the prehistoric use of these plants. *Sambucus cerulea* (elderberry) occurs in the project area (Elias 1980), and was likely to have been an important summer food in the past; however, its use or appreciation at this site is not necessarily reflected by the single grain occurrence in a sediment control sample.

It is interesting that pollen from grasses occurs in higher percentages on the grinding surfaces than in the sediment control samples. Grinding surface samples averaged 4.2% grass, while the control samples contained an average of 2% grass pollen, hinting that some of the grinding surfaces might have been used to grind this important food.

Summary

A total of 49 samples were analyzed for fossil pollen content for Metcalf Archaeological Consultants, as part of a mitigation project associated with the construction of Wyoming Interstate Company's Piceance Basin Expansion pipeline in Moffat and Rio Blanco Counties in northwestern Colorado, and Sweetwater County in southwestern Wyoming. Pollen samples examined for this project include 32 ground stone artifact washes and 17 associated sediment samples. Fossil pollen preservation was variable, but was generally poor to fair, reflecting the oxidizing conditions of the area. Pollen concentration values were likewise variable, reflecting the general preservation of the fossil pollen, and ranged from near zero to 31,355 grains/ml of sediment. Despite this poor preservation, pollen counts were achieved in all but one of the samples, and a cumulative total of 42 different taxons were noted in the Piceance pollen samples.

Most pollen grains identified in the samples reflect normal background taxons commonly encountered in pollen assemblages from the western United States. Some types, however, could well represent economically significant species, including Brassicaceae, *Eriogonum*, Cheno-Ams and *Sarcobatus*-type, *Platyopuntia*, Poaceae, Rosaceae, Solanaceae, *Prunus* and *Sambucus*. The presence of single grain occurrences of pollen from domesticated *Zea mays* at two of the Piceance sites is unexpected, and may signal trade with more southerly dwelling groups since aboriginal races of maize required longer growing seasons than were known from the project area. Future research in this area should specifically target this potentially important but unexpected resource.

The results of this report will be incorporated on a site-by-site basis in forthcoming site-specific volumes generated by Metcalf Archaeological consultants, Inc., as well as in a synthetic volume that will include the results of similar studies conducted along the Rockies Express Pipeline (REX) under the direction of Alpine Archaeological Consultants.

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APPENDIX C

Analysis of Lipids Extracted from Fire-cracked Rock

Collected from WIC Piceance Pipeline Project Sites

(edited from larger study)

by

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Introduction

A total of fifty-one fire-cracked rocks from thirteen WIC Piceance Pipeline project sites were submitted for analysis. Exterior surfaces were ground off to remove any contaminants and samples were crushed. The absorbed lipid residues were extracted with organic solvents. The lipid extracts were analyzed using gas chromatography (GC), high temperature GC (HT-GC) and high temperature gas chromatography with mass spectrometry (HT-GC/MS). Residues were identified on the basis of fatty acid decomposition patterns of experimental residues, lipid distribution patterns and through the presence of biomarkers. Procedures for the identification of archaeological residues are outlined below; following this, analytical procedures and results of each site are presented.

The Identification of Archaeological Residues

Identification of Fatty Acids

Fatty acids are the major constituents of fats and oils (lipids) and occur in nature as triglycerides, consisting of three fatty acids attached to a glycerol molecule by ester-linkages. The shorthand convention for designating fatty acids, Cx:yωz, contains three components. The "Cx" refers to a fatty acid with a carbon chain length of x number of atoms. The "y" represents the number of double bonds or points of unsaturation, and the "ωz" indicates the location of the most distal double bond on the carbon chain, i.e. closest to the methyl end. Thus, the fatty acid expressed as C18:1ω9, refers to a mono-unsaturated isomer with a chain length of 18 carbon atoms with a single double bond located nine carbons from the methyl end of the chain. Similarly, the shorthand designation, C16:0, refers to a saturated fatty acid with a chain length of 16 carbons.

Their insolubility in water and relative abundance compared to other classes of lipids, such as sterols and waxes, make fatty acids suitable for residue analysis. Since employed by Condamin *et al.* (1976), gas chromatography has been used extensively to analyze the fatty acid component of absorbed archaeological residues. The composition of uncooked plants and animals provides important baseline information, but it is not possible to directly compare modern uncooked plants and animals with highly degraded archaeological residues. Unsaturated fatty acids, which are found widely in fish and plants, decompose more readily than saturated fatty acids, sterols or waxes. In the course of decomposition, simple addition reactions might occur at points of unsaturation (Solomons 1980) or peroxidation might lead to the formation of a variety of volatile and non-volatile products which continue to degrade (Frankel 1991). Peroxidation occurs most readily in fatty acids with more than one point of unsaturation.

Attempts have been made to identify archaeological residues using criteria that discriminate uncooked foods (Marchbanks 1989; Skibo 1992; Loy 1994). The major drawback of the distinguishing ratios proposed by Marchbanks (1989), Skibo (1992) and Loy (1994) is they have never been empirically tested. The proposed ratios are based on criteria that discriminate food classes on the basis of their original fatty acid composition. The resistance of these criteria to the effects of decompositional changes has not been demonstrated. Rather, Skibo (1992) found his fatty acid ratio criteria could not be used to identify highly decomposed archaeological samples.

In order to identify a fatty acid ratio unaffected by degradation processes, Patrick *et al.* (1985) simulated the long-term decomposition of one sample and monitored the resulting changes. An experimental cooking residue of seal was prepared and degraded in order to identify a stable fatty acid ratio. Patrick *et al.* (1985) found that the ratio of two C18:1 isomers, oleic and vaccenic, did not change with decomposition; this fatty acid ratio was then used to identify an archaeological vessel residue as seal. While the fatty acid composition of uncooked foods must be known, Patrick *et al.* (1985) showed that the effects of cooking and decomposition over long periods of time on the fatty acids must also be understood.

<u>Development of the Identification Criteria</u>

As the first stage in developing the identification criteria used herein, the fatty acid compositions of more than 130 uncooked Native food plants and animals from Western Canada were determined using gas chromatography (Malainey 1997; Malainey *et al.*

1999a). When the fatty acid compositions of modern food plants and animals were subject to cluster and principal component analyses, the resultant groupings generally corresponded to divisions that exist in nature (Table 1). Clear differences in the fatty acid composition of large mammal fat, large herbivore meat, fish, plant roots, greens and berries/seeds/nuts were detected, but the fatty acid composition of meat from medium-sized mammals resembles berries/seeds/nuts.

Samples in cluster A, the large mammal and fish cluster had elevated levels of C16:0 and C18:1 (Table 1). Divisions within this cluster stemmed from the very high level of C18:1 isomers in fat, high levels of C18:0 in bison and deer meat and high levels of very long chain unsaturated fatty acids (VLCU) in fish. Differences in the fatty acid composition of plant roots, greens and berries/seeds/nuts reflect the amounts of C18:2 and C18:3ω3 present. The berry, seed, nut and small mammal meat samples appearing in cluster B have very high levels of C18:2, ranging from 35% to 64% (Table 1). Samples in subclusters V, VI and VII have levels of C18:1 isomers from 29% to 51%, as well. Plant roots, plant greens and some berries appear in cluster C. All cluster C samples have moderately high levels of C18:2; except for the berries in subcluster XII, levels of C16:0 are also elevated. Higher levels of C18:3ω3 and/or very long chain saturated fatty acids (VLCS) are also common except in the roots which form subcluster XV.

Secondly, the effects of cooking and degradation over time on fatty acid compositions were examined. Originally, 19 modern residues of plants and animals from the plains, parkland and forests of Western Canada were prepared by cooking samples of meats, fish and plants, alone or combined, in replica vessels over an open fire (Malainey 1997; Malainey *et al.* 1999b). After four days at room temperature, the vessels were broken and a set of sherds analysed to determine changes after a short term of decomposition. A second set of sherds remained at room temperature for 80 days, then placed in an oven at 75°C for a period of 30 days in order to simulate the processes of long term decomposition. The relative percentages were calculated on the basis of the ten fatty acids (C12:0, C14:0, C15:0, C16:0, C16:1, C17:0, C18:0, C18:1w9, C18:1w11, C18:2) that regularly appeared in Precontact Period vessel residues from Western Canada. Observed changes in fatty acid composition of the experimental cooking residues enabled the development of a method for identifying the archaeological residues (Table 2).

It was determined that levels of medium chain fatty acids (C12:0, C14:0 and C15:0), C18:0 and C18:1 isomers in the sample could be used to distinguish degraded experimental cooking residues (Malainey 1997; Malainey *et al.* 1999b). Higher levels of medium chain fatty acids, combined with low levels of C18:0 and C18:1 isomers, were detected in the decomposed experimental residues of plants, such as roots, greens and most berries. High levels of C18:0 indicated the presence of large herbivores. Moderate levels of C18:1 isomers, with low levels of C18:0, indicated the presence of either fish or foods similar in composition to corn. High levels of C18:1 isomers with low levels of C18:0, were found in residues of beaver or foods of similar fatty acid composition. The criteria for identifying six types of residues were established experimentally; the seventh type, plant with large herbivore, was inferred (Table 2). These criteria were applied to residues extracted from more than 200 pottery cooking vessels from 18 Western Canadian sites (Malainey 1997; Malainey *et al.* 1999c; 2001b). The identifications were found to be consistent with the evidence from faunal and tool assemblages for each site.

Work has continued to understand the decomposition patterns of various foods and food combinations (Malainey *et al.* 2000a, 2000b, 2000c, 2001a; Quigg *et al.* 2001). The collection of modern foods has expanded to include plants from the Southern Plains. The fatty acid compositions of mesquite beans (*Prosopis glandulosa*), Texas ebony seeds (*Pithecellobium ebano Berlandier*), tasajillo berry (*Opuntia leptocaulis*), prickly pear fruit and pads (*Opuntia engelmannii*), Spanish dagger pods (*Yucca treculeana*), cooked sotol (*Dasylirion wheeler*), agave (*Agave lechuguilla*), cholla (*Opuntia imbricata*), piñon (*Pinus edulis*) and Texas mountain laurel (or mescal) seed (*Sophora secundiflora*) have been determined. Experimental residues of many of these plants, alone or in combination with deer meat, have been prepared by boiling foods in clay cylinders or using sandstone for either stone boiling (Quigg *et al.* 2000) or as a griddle. In order to accelerate the processes of oxidative degradation that naturally occur at a slow rate with the passage of time, the rock or clay tile containing the experimental residue was placed in an oven at 75°C. After either 30 or 68 days, residues were extracted and analysed using gas chromatography. The results of these decomposition studies enabled refinement of the identification criteria (Malainey 2007).

<u>Using Lipid Distribution and Biomarkers to Identify Archaeological Residues</u>

Archaeological scientists working in the United Kingdom have had tremendous success using high temperature-gas chromatography (HT-GC) and gas chromatography with mass spectrometry (HT-GC/MS) to identify biomarkers. High temperature gas chromatography is used to separate and assess a wide range of lipid components, including fatty acids, long chain alcohols and hydrocarbons, sterols, waxes, terpenoids and triacylglycerols (Evershed *et al.* 2001). The molecular structure of separated components is elucidated by mass spectrometry (Evershed 2000).

Triacylglycerols, diacylglycerols and sterols can be used to distinguish animal-derived residues, which contain cholesterol and significant levels of both triacylglycerols, from plant-derived residues, indicated by plant sterols, such as β-sitosterol, stigmasterol and campesterol, and only traces of triacylglycerols (Evershed 1993; Evershed *et al.* 1997a; Dudd and Evershed 1998). Barnard *et al.* (2007), however, have recently suggested that microorganisms living off residues can introduce β-sitosterol into residues resulting from the preparation of animal products. Waxes, which are long-chain fatty acids and long-chain alcohols that form protective coatings on skin, fur, feathers, leaves and fruit, also resist decay. Evershed *et al.* (1991) found epicuticular leaf waxes from plants of the genus *Brassica* in vessel residues from a Late Saxon/Medieval settlement. Cooking experiments later confirmed the utility of nonacosane, nonacosan-15-one and nonacosan-15-ol to indicate the preparation of leafy vegetables, such as turnip or cabbage (Charters *et al.* 1997). Reber *et al.* (2004) recently suggested *n*-dotriacontanol could serve as an effective biomarker for maize in vessel residues from sites located in Midwestern and Eastern North America. Beeswax can be identified by the presence and distribution of n-alkanes with carbon chains 23 to 33 atoms in length and palmitic acid wax esters with chains between 40 and 52 carbons in length (Heron *et al.* 1994; Evershed *et al.* 1997b).

Terpenoid compounds, or terpenes, are long chain alkenes that occur in the tars and pitches of higher plants. The use of GC and GC/MS to detect the diterpenoid, dehydroabietic acid, from conifer products in archaeological residues extends over a span of 25 years (Shackley 1982; Heron and Pollard 1988). Lupeol, α- and β-amyrin and their derivatives indicate the presence of plant materials (Regert 2007). Eerkens (2002) used the predominance of the diterpenoid, Δ–8(9)-isopimaric acid, in a vessel residue from the western Great Basin to argue it contained piñyon resins. Other analytical techniques have also been used to identify terpenoid compounds. Sauter *et al.* (1987) detected the triterpenoid, betulin, in Iron Age tar using both ^{1}H and ^{13}C nuclear magnetic resonance spectroscopy (NMR), confirming the tar was produced from birch.

Methodology

Possible contaminants were removed by grinding off the exterior surfaces with a Dremel® tool fitted with a silicon carbide bit. Immediately thereafter, the sample was crushed with a hammer mortar and pestle and the powder transferred to an Erlenmeyer flask. Lipids were extracted using a variation of the method developed by Folch *et al.* (1957). The powdered sample was mixed with a 2:1 mixture, by volume, of chloroform and methanol (2 X 25 mL) using ultrasonication (2 X 10 min). Solids were removed by filtering the solvent mixture into a separatory funnel. The lipid/solvent filtrate was washed with 13.3 mL of ultrapure water. Once separation into two phases was complete, the lower chloroform-lipid phase was transferred to a round-bottomed flask and the chloroform removed by rotary evaporation. Any remaining water was removed by evaporation with 2-propanol (1.5 mL); 1.5 mL of chloroform-methanol (2:1, v/v) was used to transfer the dry total lipid extract to a screw-top glass vial with a Teflon®-lined cap. The sample was flushed with nitrogen and stored in a -20°C freezer.

Preparation of FAMES

A 400 μL aliquot of the total lipid extract solution was placed in a screw-top test tube and dried in a heating block under nitrogen. Fatty acid methyl esters (FAMES) were prepared by treating the dry lipid with 5 mL of 0.5 N anhydrous hydrochloric acid in methanol (68°C; 60 min). Fatty acids that occur in the sample as di- or triglycerides are detached from the glycerol molecule and converted to methyl esters. After cooling to room temperature, 3.4 mL of ultrapure water was added. FAMES were recovered with petroleum ether (2.5 mL) and transferred to a vial. The solvent was removed by heat under a gentle stream of nitrogen; the FAMES were dissolved in 75 μL of *iso*-octane then transferred to a GC vial with a conical glass insert.

Preparation of TMS derivatives

A 100 μL aliquot of the total lipid extract solution was placed in a screw-top vial and dried under nitrogen. Trimethylsilyl (TMS) derivatives were prepared by treating the lipid with 70 μL of *N,O*-bis(trimethylsilyl)trifluoroacetamide (BSTFA) containing 1% trimethylchlorosilane, by volume (70°C; 30 min.). The sample was then dried under nitrogen and the TMS derivatives were redissolved in 70 μL of hexane.

Solvents and chemicals were checked for purity by running a sample blank. Traces of contamination were subtracted from sample chromatograms. The relative percentage composition was calculated by dividing the integrated peak area of each fatty acid by the total area of fatty acids present in the sample.

The step in the extraction procedure where the chloroform, methanol and lipid mixture is washed with water is standard procedure for the extraction of lipids from modern samples. Although Evershed *et al.* (1990) suggests this is not required for archaeological samples, it is performed to remove impurities so that clearer chromatograms could be obtained in the region where very long chain fatty acids (C20:0, C20:1, C22:0 and C24:0) occur. It was anticipated that the detection and accurate assessment of these fatty acids could be instrumental in separating residues of animal origin from those of plant (Malainey *et al.* 2000a, 2000b, 2000c, 2001a).

In order to identify the residue on the basis of fatty acid composition, the relative percentage composition was determined first with respect to all fatty acids present in the sample (including very long chain fatty acids) (see Table 3) and second with respect to the ten fatty acids utilized in the development of the identification criteria (C12:0, C14:0, C15:0, C16:0, C16:1, C17:0, C18:0, C18:1w9, C18:1w11 and C18:2) (not shown). The second step is necessary for the application of the identification criteria presented in Table 2. It must be understood that the identifications given do not necessarily mean that those particular foods were actually prepared because different foods of similar fatty acid composition and lipid content would produce similar residues. It is possible only to say that the material of origin for the residue was similar in composition to the food(s) indicated. High temperature gas chromatography and high temperature gas chromatography with mass spectrometry is used to further clarify the identifications.

Gas Chromatography Analysis Parameters

The GC analysis was performed on a Varian 3800 gas chromatograph fitted with a flame ionization detector connected to a personal computer. Samples were separated using a DB-23 fused silica capillary column (30 m X 0.25 mm I.D.; J&W Scientific; Folsom, CA). An autosampler injected a 3 μL sample using a split/splitless injection system. Hydrogen was used as the carrier gas with a column flow of 1.0 mL/min. Column temperature was held at 80°C for 1 minute then increased to 140°C at a rate of 20 °C per minute. It was then programmed from 140 to 230°C at 4°C per minute. The upper temperature was held for 17 minutes. Chromatogram peaks were integrated using Varian

MS Workstation® software and identified through comparisons with external qualitative standards (NuCheck Prep; Elysian, MN).

High Temperature Gas Chromatography and Gas Chromatography with Mass Spectrometry

Both HT-GC and HT GC-MS analyses were performed on a Varian 3800 gas chromatograph fitted with a flame ionization detector and Varian 4000 mass spectrometer connected to a personal computer. For HT-GC analysis, the sample was injected onto a DB-1ht fused silica capillary column (15 m X 0.32 mm I.D.; Agilent J&W; Santa Clara, CA) connected to the flame ionization detector, using hydrogen as the carrier gas. For HT-GC/MS analysis, samples were injected onto a VF-5ht fused silica capillary column (30 m X 0.25 mm I.D.; Varian; Palo Alto, CA) connected to the mass spectrometer, using helium as the carrier gas. For both analyses, the column temperature was held at 50°C for 2 minutes then increased to 350°C at a rate of 10°C per minute. The Varian 4000 mass spectrometer was operated in electron-impact ionization mode scanning from m/z 50-700. Chromatogram peaks and MS spectra were processed using Varian MS Workstation® software and identified through comparisons with external qualitative standards (Sigma Aldrich; St. Louis, MO and NuCheck Prep; Elysian, MN), reference samples and the NIST database.

Results from Site 5MF6255

Lipid residues were extracted from two samples from Site 5MF6255; the composition of residue 9MCF 11 is presented in Table 3e. The term, Area, represents the area under the chromatographic peak of a given fatty acid, as calculated by the Varian MS Workstation ® software minus the solvent blank. The term, Rel%, represents the relative percentage of the fatty acid with respect to the total fatty acids in the sample. The identifications of fatty acids were verified through high temperature GC/MS; in addition, lipid biomarkers were detected. Insufficient fatty acids were present in residue 9MCF 10 to attempt an identification and no biomarkers were detected (Table 4a).

Residue 9MCF 11 is characterized by fairly high levels of C18:0, 31.64%, which is typical of the residues of large herbivores, such as deer, bison and moose, but javelina meat and the seed oils of certain tropical plants, such as sotol produce similar residues. The levels of C18:1 isomers is quite high, possibly due to the preparation of fatty meat or from combining meat with moderate-high fat plant products, such as seed and nuts.

Dehydroabietic acid appears to be present in residue 9MCF 11, which indicates the presence of conifer products. The source is not known, however; they may have been introduced from firewood, resins or other conifer products. Azelaic acid was also detected; this short chain dicarboxylic acid is associated with the oxidation of unsaturated fatty acids (Regert et al. 1998). Unsaturated fatty acids are most abundant in seed oils so it is possible that a combination of meat and plant seeds were prepared in the vessel. Unfortunately no animal or plant sterols were detected in this residue.

List of Tables

Table 1. Summary of average fatty acid compositions of modern food groups generated by hierarchical cluster analysis.

Cluster	A				B						C				
Subcluster	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**	**XIII**	**XIV**	**XV**
Type	Mammal Fat and Marrow	Large Herbivore Meat	Fish	Fish	Berries and Nuts	Mixed	Seeds and Berries	Roots	Seeds	Mixed	Greens	Berries	Roots	Greens	Roots
C16:0	19.90	19.39	16.07	14.10	3.75	12.06	7.48	19.98	7.52	10.33	18.71	3.47	22.68	24.19	18.71
C18:0	7.06	20.35	3.87	2.78	1.47	2.36	2.58	2.59	3.55	2.43	2.48	1.34	3.15	3.66	5.94
C18:1	56.77	35.79	18.28	31.96	51.14	35.29	29.12	6.55	10.02	15.62	5.03	14.95	12.12	4.05	3.34
C18:2	7.01	8.93	2.91	4.04	41.44	35.83	54.69	48.74	64.14	39.24	18.82	29.08	26.24	16.15	15.61
C18:3	0.68	2.61	4.39	3.83	1.05	3.66	1.51	7.24	5.49	19.77	35.08	39.75	9.64	17.88	3.42
VLCS	0.16	0.32	0.23	0.15	0.76	4.46	2.98	8.50	5.19	3.73	6.77	9.10	15.32	18.68	43.36
VLCU	0.77	4.29	39.92	24.11	0.25	2.70	1.00	2.23	0.99	2.65	1.13	0.95	2.06	0.72	1.10

VLCS- Very Long Chain (C20, C22 and C24) Saturated Fatty Acids

VLCU - Very Long Chain (C20, C22 and C24) Unsaturated Fatty Acids

Table 2. Criteria for the identification of archaeological residues based on the decomposition patterns of experimental cooking residues prepared in pottery vessels.

Identification	**Medium Chain**	**C18:0**	**C18:1 isomers**
Large herbivore	$\leq 15\%$	$\geq 27.5\%$	$\leq 15\%$
Large herbivore with plant OR Bone marrow	low	$\geq 25\%$	$15\% \leq X \leq 25\%$
Plant with large herbivore	$\geq 15\%$	$\geq 25\%$	no data
Beaver	low	Low	$\geq 25\%$
Fish or Corn	low	$\leq 25\%$	$15\% \leq X \leq 27.5\%$
Fish or Corn with Plant	$\geq 15\%$	$\leq 25\%$	$15\% \leq X \leq 27.5\%$
Plant (except corn)	$\geq 10\%$	$\leq 27.5\%$	$\leq 15\%$

Table 3e. Description and Lipid Analysis Results from site 5MF6255.

Fatty acid	9MCF 11	
	Area	**Rel%**
C12:0	2508	0.55
C14:0	10693	2.33
C14:1	0	0.00
C15:0	3458	0.75
C16:0	156805	34.10
C16:1	1986	0.43
C17:0	3327	0.72
C17:1	5592	1.22
C18:0	145477	31.64
C18:1s	113242	24.63
C18:2	486	0.11
C18:3w3	0	0.00
C20:0	6315	1.37
C20:1	2039	0.44
C24:0	7866	1.71
C24:1	0	0.00
Total	459794	100.00
Mass	28.381 g	
Description	Sample #116; Feature #15	
Lipid Biomarkers	Dehydroabietic acid; Azelaic acid	
Identification	Large Herbivore, either fatty meat or moderate-high fat seeds or nuts; conifer products present	

Table 4a. Results from Site 5MF6255 Residues with Low Levels of Fatty Acids.

Lab No.	Description	Mass	Biomarkers	Identification
9MCF 10	Sample #34	25.567	None	No lipids present

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APPENDIX D

Radiocarbon Reports

by

Beta Analytic, Inc.

Miami, Florida

and

Institute of Alpine and Arctic Research Laboratory

University of Colorado at Boulder

Boulder, Colorado

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.2:lab. mult=1)

Laboratory number: **Beta-266648**

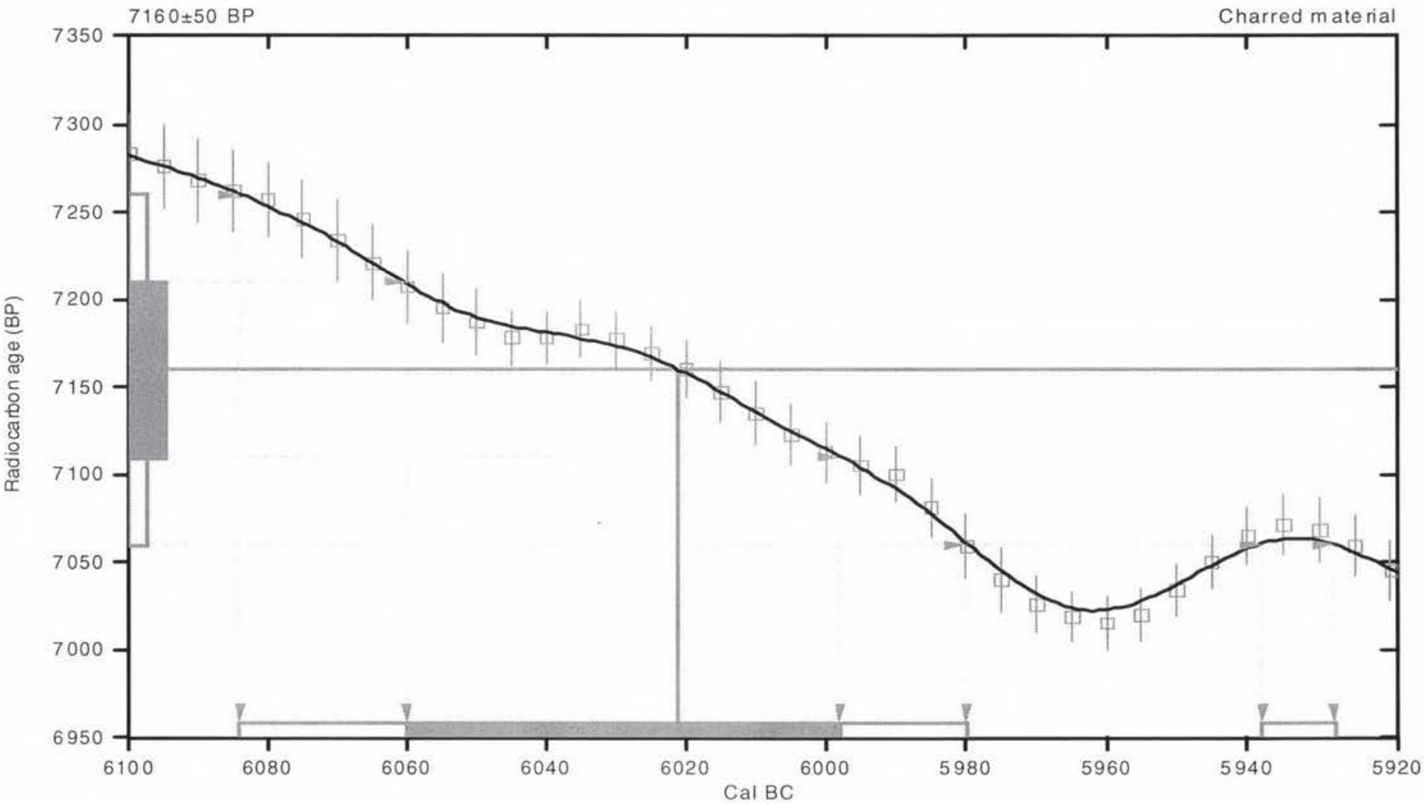
Conventional radiocarbon age: **7160±50 BP**

2 Sigma calibrated results: (95% probability) **Cal BC 6080 to 5980 (Cal BP 8030 to 7930) and Cal BC 5940 to 5930 (Cal BP 7890 to 7880)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 6020 (Cal BP 7970)

1 Sigma calibrated result: (68% probability) Cal BC 6060 to 6000 (Cal BP 8010 to 7950)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.9:lab. mult=1)

Laboratory number: **Beta-220514**

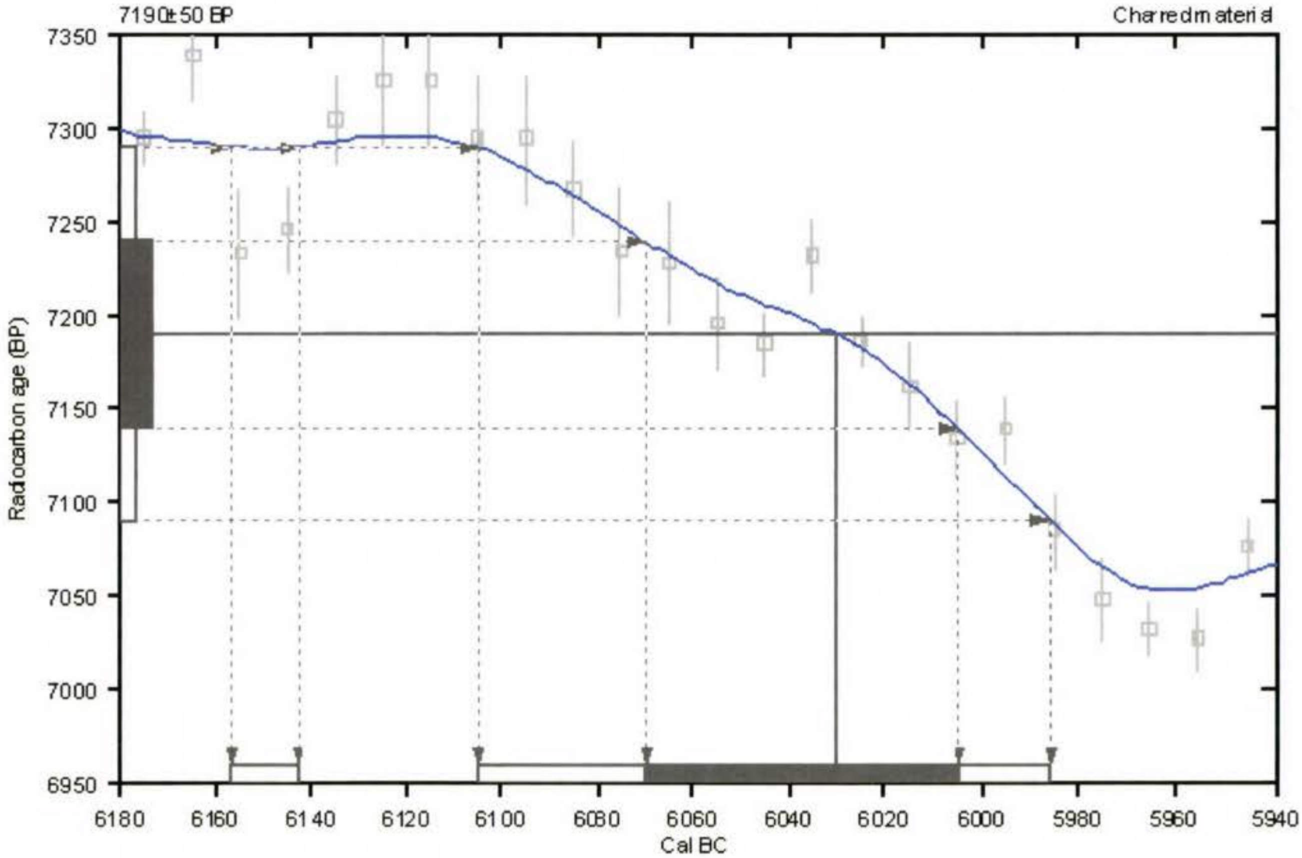
Conventional radiocarbon age: **7190±50 BP**

2 Sigma calibrated results: **Cal BC 6160 to 6140 (Cal BP 8110 to 8090) and**
(95% probability) **Cal BC 6100 to 5990 (Cal BP 8060 to 7940)**

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 6030 (Cal BP 7980)

1 Sigma calibrated result: Cal BC 6070 to 6000 (Cal BP 8020 to 7960)
(68% probability)



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Calibration Database
Editorial Comment
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Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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http://www.colorado.edu/INSTAAR/RadiocarbonDatingLab/

RADIOCARBON DATING RESULTS

Results for: Craig Lee
INSTAAR

AMS Result number: **CURL-10327**

Sample Name: **5MF6255-S42**
(NSRLReceipt #-16343)

Project and site: Piceance
5MF6255

Core and stratigraphy:
not specified

Sample Type: Charcoal

probable sage brush

Fraction dated: MACROFOSSIL

Mass of graphite used: 0.86mg

$\partial^{13}C_{wrt\ PDB}$: -25.6‰ (AMS MEASURED)

Fraction modern: 0.4039 ±.0013

Radiocarbon Age: **7285 ±30 radiocarbon years BP**

Result reported:2/25/2009

When reporting this result, please include the CURL number, which is the unique identifier for this measurement. Results are reported following Stuiver and Polach (1977), fraction modern is not corrected for decay. Delta^{13}C values were measured on prepared graphite using the AMS spectrometer. These can differ slightly (typically by 1-3‰) from those of the the original material, if fractionation ocurred during sample graphitization or the AMS measurement.Further information on laboratory procedures can be found on our website or by contacting us.

University of Colorado at Boulder
INSTAAR - Laboratory for AMS Radiocarbon Preparation and Research
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fax (303) 492-6388
email jocelyn.turnbull@colorado.edu
http://www.colorado.edu/INSTAAR/RadiocarbonDatingLab/

RADIOCARBON DATING RESULTS

Results for: Craig Lee
INSTAAR

AMS Result number: **CURL-10321**

Sample Name: **5MF6255-S84**
(NSRLReceipt #-16344)

Project and site: Piceance
5MF6255

Core and stratigraphy:
not specified

Sample Type: Charcoal

probable sage brush

Fraction dated: MACROFOSSIL

Mass of graphite used: 0.82mg

$\partial^{13}C_{wrt\ PDB}$: -24.6‰ (AMS MEASURED)

Fraction modern: 0.4068 ±.0011

Radiocarbon Age: **7225 ±25 radiocarbon years BP**

Result reported:2/25/2009

When reporting this result, please include the CURL number, which is the unique identifier for this measurement. Results are reported following Stuiver and Polach (1977), fraction modern is not corrected for decay. Delta^{13}C values were measured on prepared graphite using the AMS spectrometer. These can differ slightly (typically by 1-3‰) from those of the the original material, if fractionation ocurred during sample graphitization or the AMS measurement.Further information on laboratory procedures can be found on our website or by contacting us.

University of Colorado at Boulder
INSTAAR - Laboratory for AMS Radiocarbon Preparation and Research
1560 30th St ph (303) 735-6611
UCB 450 fax (303) 492-6388
Boulder, Colorado 80309-0450, USA email jocelyn.turnbull@colorado.edu
http://www.colorado.edu/INSTAAR/RadiocarbonDatingLab/

RADIOCARBON DATING RESULTS

Results for: Craig Lee
INSTAAR

AMS Result number: **CURL-10310**

Sample Name: **5MF6255-S92**
(NSRLReceipt #-16345)

Project and site: Piceance
5MF6255

Core and stratigraphy:
not specified

Sample Type: Charcoal

probable sage brush

Fraction dated: MACROFOSSIL

Mass of graphite used: 0.85mg

$\partial^{13}C_{wrt\ PDB}$: -25.2‰ (AMS MEASURED)

Fraction modern: 0.4174 ±.0011

Radiocarbon Age: **7020 ±25 radiocarbon years BP**

Result reported:2/25/2009

When reporting this result, please include the CURL number, which is the unique identifier for this measurement. Results are reported following Stuiver and Polach (1977), fraction modern is not corrected for decay. Delta^{13}C values were measured on prepared graphite using the AMS spectrometer. These can differ slightly (typically by 1-3‰) from those of the the original material, if fractionation ocurred during sample graphitization or the AMS measurement.Further information on laboratory procedures can be found on our website or by contacting us.

APPENDIX E

Obsidian Source Analysis

by

Richard Hughes, Ph.D.

Geochemical Research Laboratory

Geochemical Research Laboratory Letter Report 2008-124

January 2, 2009

Ms. Jenny Stahl
Staff Archaeologist
Metcalf Archaeological Consultants, Inc.
4955 Miller Street, Suite 201
Wheat Ridge, CO 80033

Dear Jenny:

Enclosed with this letter you will find tables and figures presenting energy dispersive x-ray fluorescence (edxrf) data generated from the analysis of 22 obsidian artifacts from six archaeological sites in Moffat County, Colorado, and in Sweetwater County, Wyoming. The edxrf research reported herein was completed pursuant to your request of December 10, 2008.

Laboratory analysis conditions, artifact-to-source (geochemical type) attribution procedures, element-specific measurement resolution, and literature references applicable to these samples follow those I reported recently for artifacts from 5MF1915 (Hughes 2008).

Table 1

Quantitative Composition Estimates for Obsidian Artifacts from 5MF2977, 48SW8828, 48SW12257, and 48SW15758

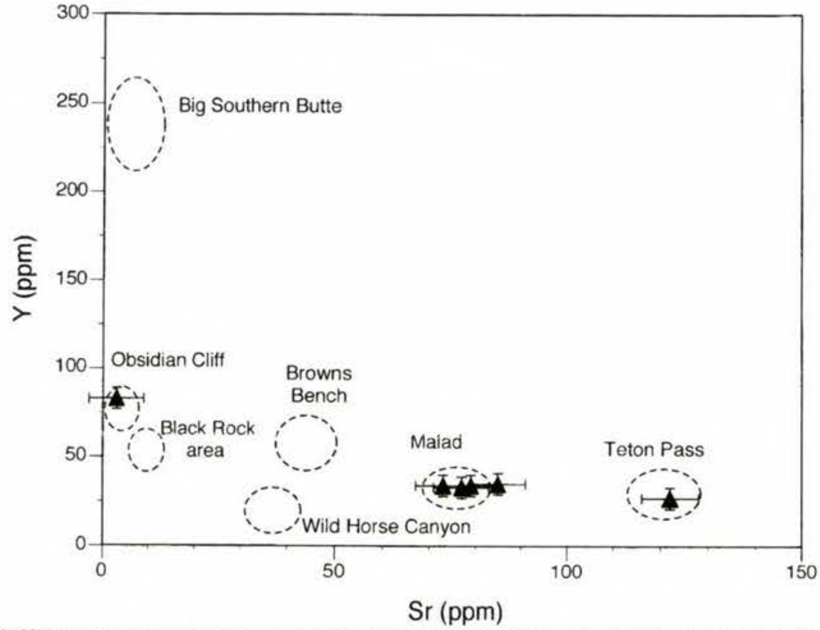
	Trace Element Concentrations											Ratio	
Cat. Number	Zn	Ga	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	$Fe_2O_3{}^T$	Fe/Mn	Obsidian Source (Chemical Type)
5MF2997, FS # 2675	nm	nm	131 ±4	79 ±3	34 ±3	91 ±4	17 ±3	nm	nm	nm	nm	45	Malad, ID
48SW8828, FS # 31	nm	nm	112 ±4	122 ±3	27 ±3	73 ±4	14 ±3	nm	nm	nm	nm	29	Teton Pass, WY
48SW12257, FS # 9	nm	nm	126 ±4	73 ±3	34 ±3	88 ±4	15 ±3	1560 ±32	nm	nm	nm	45	Malad, ID
48SW12257, FS # 100	nm	nm	130 ±4	77 ±3	33 ±3	86 ±4	17 ±3	1496 ±36	nm	nm	nm	45	Malad, ID
48SW12257, FS # 102	nm	nm	132 ±4	85 ±3	35 ±3	90 ±4	16 ±3	1488 ±38	nm	nm	nm	46	Malad, ID
48SW15758, FS # 1	nm	nm	250 ±4	3 ±3	82 ±3	171 ±4	53 ±3	nm	nm	nm	nm	67	Obsidian Cliff, WY
U.S. Geological Survey Reference Standard													
RGM-1 (measured)	nm	nm	151 ±4	108 ±3	25 ±3	221 ±4	9 ±3	786 ±28	nm	nm	1.87 ±.02	60	Glass Mountain, CA
RGM-1 (recommended)	32	15	149	108	25	219	9	807	1600	279	1.86	nr	Glass Mountain, CA

Values in parts per million (ppm) except total iron [in weight %] and Fe/Mn intensity ratios; ± = two σ expression of x-ray counting uncertainty and regression fitting error at 120-360 seconds livetime. nm= not measured; nr = not reported.

Table 1 and Figure 1 show that four of these artifacts have the same composition as Malad, Idaho, obsidian, with single specimens made from Teton Pass and from Obsidian Cliff volcanic glass.

Figure 1

Yr vs. Sr Composition for Obsidian Artifacts from 5MF2977, 48SW8828, 48SW12257, and 48SW15758



Dashed lines represent range of variation measured in archaeologically significant geologic obsidian source samples from the Rocky Mountains area. Filled triangles are the plots for samples from Table 1. Error bars are two-sigma (95% confidence interval) composition estimates for each specimen.

Sixteen other specimens were too small and thin to generate x-ray counting statistics adequate for proper conversion from background-corrected intensities to quantitative concentration estimates (i.e., ppm) so I analyzed all of them to generate integrated net count (intensity) data for the elements Rb, Sr, Zr, Mn and Fe (see Hughes 2008 for further description of analysis protocol). Data derived from the integrated net intensity analyses appear in Tables 2 and 3.

Bivariate plots (see Figure 2) effectively show that nine samples fall within the Fe/Mn vs. Zr/Nb ratio range for Bear Gulch, Idaho, obsidian while two samples each plot within the range for Malad, Idaho, and Polvadera Peak, New Mexico, volcanic glass. Single artifacts correspond with the Fe/Mn vs. Zr/Nb range for Obsidian Cliff, Wyoming, Big Southern Butte, Idaho, and Government Mountain, Arizona, volcanic glass. Figure 2 (see insert) shows that Polvadera Peak and Government Mountain are very similar on the basis of Fe/Mn vs. Zr/Nb ratios, but these two sources can be easily distinguished on the basis of Rb/Sr ratios (see Figure 3).

Table 2

Integrated Net Count Rate Data for Obsidian Samples from 5MF2997, Colorado

	Element Intensities							Intensity Ratios						
FS no.	Rb	Sr	Zr	Σ Rb,Sr,Zr	Rb%	Sr%	Zr%	Fe/Mn	Rb/Sr	Zr/Y	Y/Nb	Zr/Nb	Sr/Y	Obsidian Source (Chemical Type)
2683	395	113	1131	1639	.241	.069	.690	51.7	3.5	7.9	.7	5.2	.8	Bear Gulch, ID
5284	676	13	709	1398	.484	.009	.507	67.8	52.0	2.8	1.3	3.7	.1	Obsidian Cliff, WY
5285	315	90	830	1235	.255	.073	.672	50.6	3.5	8.5	.6	5.2	.9	Bear Gulch, ID
5286	363	104	1064	1531	.237	.068	.695	50.6	3.5	8.7	.6	5.0	.9	Bear Gulch, ID
5287	400	118	1133	1651	.242	.072	.686	51.4	3.4	8.7	.6	5.2	.9	Bear Gulch, ID
5288	408	118	1166	1692	.241	.070	.689	54.4	3.5	8.4	.6	5.0	.9	Bear Gulch, ID
5289	225	11	171	407	.553	.027	.420	13.1	20.5	4.5	.3	1.5	.3	Polvadera Peak, NM
5290	361	103	1039	1503	.240	.069	.691	53.5	3.5	9.0	.5	5.0	.9	Bear Gulch, ID
5291	381	114	1108	1603	.238	.071	.691	52.4	3.3	8.3	.6	5.0	.9	Bear Gulch, ID
5292	377	111	1100	1588	.237	.070	.693	52.9	3.4	8.3	.6	5.1	.8	Bear Gulch, ID
5293	201	50	494	745	.270	.067	.663	52.2	4.0	7.3	.7	5.0	.7	Bear Gulch, ID

Elemental intensities (peak counts/second above background) generated at 30 seconds livetime.

Table 3

Integrated Net Count Rate Data for Obsidian Samples from 5MF6255, 5MF2990, and 48SW12257

	Element Intensities							Intensity Ratios						
FS no.	Rb	Sr	Zr	Σ Rb,Sr,Zr	Rb%	Sr%	Zr%	Fe/Mn	Rb/Sr	Zr/Y	Y/Nb	Zr/Nb	Sr/Y	Obsidian Source (Chemical Type)
FS 433	639	4	1049	1692	.378	.002	.620	56.7	159.8	1.7	.6	1.0	.01	Big S. Butte, ID
FS 2305	362	12	257	631	.574	.019	.407	12.1	22.2	4.7	.3	1.2	.2	Polvadera Peak, NM
FS 2583	266	231	302	799	.333	.289	.378	15.3	1.2	4.8	.3	1.3	3.7	Government Mtn., AZ
12257 FS 7	277	180	303	760	.365	.237	.398	45.6	1.5	3.3	1.8	5.8	1.9	Malad, ID
FS 101	313	206	347	866	.361	.238	.401	43.2	1.5	3.2	2.0	6.4	1.9	Malad, ID

Elemental intensities (peak counts/second above background) generated at 30 seconds livetime. Sample FS 433 from 5MF6255; samples FS 2305 and FS 2583 from 5MF2990; samples FS 7 and FS 101 from 48SW12257

Combining quantitative analysis results (Table 1) with integrated net count rate data (Tables 2 and 3) the site-specific results of this research can be summarized as follows.

Of two samples analyzed from 5MF2990, one was made from obsidian from Polvadera Peak and the other from volcanic glass of the Government Mountain chemical type.

Twelve samples were analyzed from 5MF2997. Of this total nine were manufactured from Bear Gulch obsidian, with single specimens made from Obsidian Cliff, Malad, and Polvadera Peak volcanic glass.

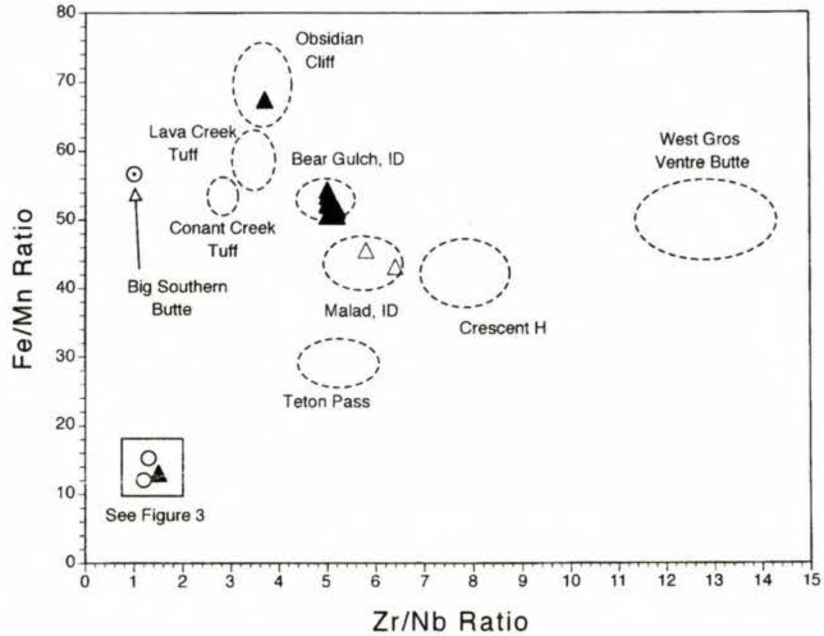
The single sample analyzed from 5MF6255 was made from Big Southern Butte volcanic glass, while the single artifact analyzed from 48SW8828 was fashioned from Teton Pass obsidian.

All five specimens analyzed from 48SW12257 were manufactured from Malad volcanic glass.

Finally, the sole specimen analyzed from 48SW15758 was made from Obsidian Cliff obsidian.

Figure 2

Fe/Mn vs. Zr/Nb Composition for Obsidian Artifacts from 5MF2990, 5MF2977, 5MF6255, and 48SW12257



Dashed lines represent range of variation measured in archaeologically significant geologic obsidian source samples from the Rocky Mountains area. Filled triangles are the plots (from Tables 2 and 3) for samples from 5MF2997, open triangles are samples from 48SW12257, open circles are specimens from 5MF2990, and the sample from 5MF6255 is represented by a dot within an open circle.

I hope this information will help in your evaluation of the significance of these artifacts. Please contact me at my laboratory ([650] 851-1410; e-mail: rehughes@silcon.com) if I can be of further assistance.

Sincerely,

Richard E. Hughes

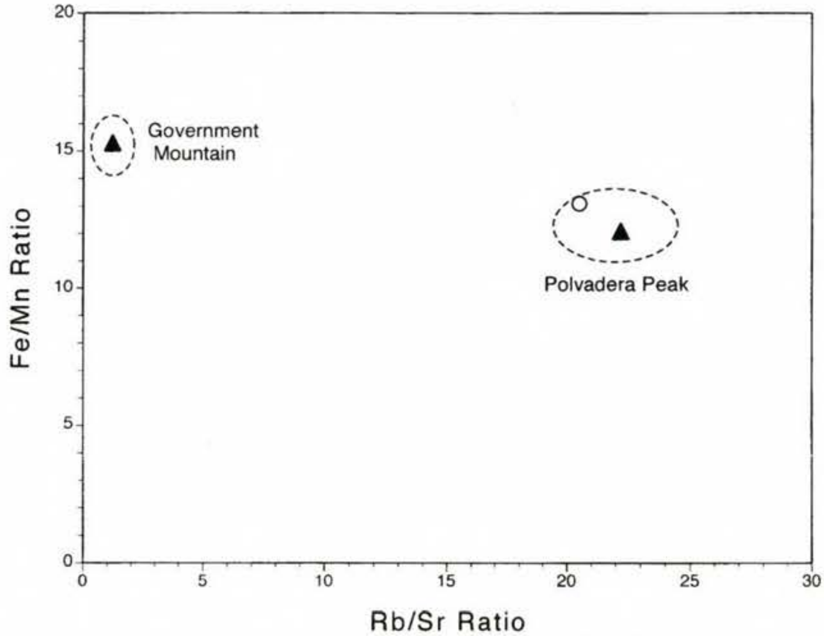
Richard E. Hughes, Ph.D., RPA
Director, Geochemical Research Laboratory

REFERENCE

Hughes, Richard E.
2008 Energy Dispersive X-ray Fluorescence Analysis of Obsidian Artifacts from Archaeological Site 5MF1915, Located Northwest of the Danforth Hills in the Piceance Basin of Northwestern Colorado. Geochemical Research Laboratory Letter Report 2008-116 submitted to Jenny Stahl, Metcalf Archaeological Consultants, Inc., December 11, 2008.

Figure 3

Fe/Mn vs. Rb/Sr Composition for Obsidian Artifacts from 5MF2990, and 5MF2977



Dashed lines represent range of variation measured in archaeologically significant geologic obsidian source samples from the Rocky Mountains area. Filled triangles are the plots for samples from 5MF2990, open circle is the plot for a specimen from 5MF2997 (data from Tables 2 and 3).

APPENDIX F

Obsidian Hydration Dating

by

Tom Origer

Tom Origer & Associates

Rohnert Park, California

Origer's Obsidian Laboratory
P.O. Box 1531
Rohnert Park, California 94927
(707) 584-8200, Fax 584-8300
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April 3, 2009

Jenny Stahl
Metcalf Archaeological Consultants, Inc.
4955 Miller Street, Suite 201
Wheat Ridge, Colorado 80022-2234

Dear Ms. Stahl:

I write to report the results of obsidian hydration band analysis of one specimen from site 5MF6255, which is located in Moffat County, Colorado. This work was completed as requested in your letter dated 5 March 2009.

Procedures typically used by our lab for preparation of thin sections and measurement of hydration bands are described here. Specimens are examined to find two or more surfaces that will yield edges that will be perpendicular to the microslides when preparation of each thin section is done. Generally, two parallel cuts are made at an appropriate location along the edge of each specimen with a four-inch diameter circular saw blade mounted on a lapidary trimsaw. The cuts result in the isolation of small samples with a thickness of about one millimeter. The samples are removed from the specimens and mounted with Lakeside Cement onto etched glass micro-slides.

The thickness of samples is reduced by manual grinding with a slurry of #600 silicon carbide abrasive on plate glass. Grinding is completed in two steps. The first grinding is stopped when each sample's thickness is reduced by approximately one-half. This eliminates micro-flake scars created by the saw blade during the cutting process. Each slide is reheated, which liquefies the Lakeside Cement, and the samples are inverted. The newly exposed surfaces are then ground until proper thickness is attained.

Correct thin section thickness is determined by the "touch" technique. A finger is rubbed across the slide, onto the sample, and the difference (sample thickness) is "felt." The second technique used to arrive at proper thin section thickness is the "transparency" test where the micro-slide is held up to a strong source of light and the translucency of each sample is observed. The samples are reduced enough when it readily allows the passage of light. A cover glass is affixed over each sample when grinding is completed. The slides and paperwork are stored under File No. OOL-436g.

The hydration bands are measured with a strainfree 60-power objective and a Bausch and Lomb 12.5-power filar micrometer eyepiece mounted on a Nikon Labophot-Pol polarizing microscope. Hydration band measurements have a range of +/- 0.2 microns due to normal equipment limitations.

The specimen is marked by a hydration band that measured 4.1 microns. I am unaware of any rate for the source of this obsidian, nor have induced hydration studies been completed; therefore, no dating is attempted.

Please don't hesitate to contact me if you have questions regarding this hydration work.

Sincerely,

Thomas M. Origer
Director

APPENDIX G

Macrobotanical Results from Selected Sites for the Piceance Basin Expansion Project

(edited from larger study)

by

Abbie Bollans

Alpine Archaeological Consultants, Inc.

Montrose, Colorado

MACROBOTANICAL RESULTS FROM SELECTED SITES FOR THE PICEANCE BASIN EXPANSION PROJECT

by

Abbie Bollans

Macrobotanical Specialist

Alpine Archaeological Consultants, Inc.

Montrose, Colorado

Macrobotanical Analysis

Bulk soil samples from 13 sites were collected by Metcalf Archaeological Consultants, Inc. for the Piceance Basin Project in 2006. These samples were sent to Alpine Archaeological Consultants, Inc. for macrobotanical processing and analysis. Macrobotanical remains were systematically identified to provide additional information about prehistoric and historic subsistence in addition to domestic plant use within the project area.

Methodology

Bulk soil samples were processed using a Flote-Tech Model A flotation machine and dried. The light fractions of each sample were then placed through a series of geologic screens and separated into 2 mm, 1 mm, 0.5 mm and <0.5 mm size fractions. The largest particle size fractions were sorted first and the smaller sizes in succession in order to maximize the amounts of recognizable plant parts (Bohrer and Adams 1976:53; Struever 1977:30-31). Whole and partial plant parts were removed from the light factions and placed into small plastic vials for later identification. Both charred and uncharred plant specimens were removed for identification. Bone fragments, debitage, and gastropods, when present, were also removed from light fraction samples and curated for future analyses.

Charred and uncharred materials were identified to the most specific level possible with the aid of a modern comparative plant collection housed at Alpine Archaeological Consultants, Inc. In addition, publications (Davis 1993; Hoadley 1990; Martin and Barkley 1961; USDA 1971; USDA) were used to supplement identifications. Specimens and their condition (charred or uncharred) were listed on a standardized template form and compiled. Only charred plant tissues are considered to be of prehistoric significance as uncharred plant materials are assumed to be introduced contaminants (Minnis 1985; Pearsall 1989).

Furthermore, all light fractions were placed through a 2 mm size screen, and when available, twenty charcoal specimens larger than 2 mm were selected at random for identification. Next, these pieces of charcoal were broken to create fresh cross, radial, and tangential sections to facilitate identification. Charcoal specimens were then identified using a light binocular microscope at 10-45X power. Publications (Adams and Murray 2004; Hoadley 1990; Minnis 1987) were used to supplement identifications, and identified charcoal specimens were checked against a comparative charred wood collection at Alpine Archaeological Consultants, Inc. Wood specimens were identified to the most specific taxonomic level possible and compiled for each light fraction sample. Identified charcoal specimens were placed into aluminum foil packets and labeled. These packets were then placed into small manila envelopes and rejoined with the rest of the flotation sample.

5MF6255

Twenty flotation samples were collected and analyzed from 5MF6255. Two samples contained charred Cheno-Am (*Chenopodium / Amaranthus*) seeds, and 6 samples contained sagebrush (*Artemisia* spp.) charcoal. According to ethnographic evidence, Cheno-Am seeds were stored, ground, and used for flour or meal (Buskirk 1986; Castetter and Opler 1936; Chamberlin 1974 7190; Colton; Elmore 1944; Vestal). Also, sagebrush wood was used by southwestern tribes for fuel, construction and ritual materials, and medicine (Bye 1972; Chamberlin 1974; Elmore 1944; Robbins, et al. 1916; Whiting 1985). Sagebrush was the primary fuelwood at the site. Table 5 lists charred propagules, plant parts, and wood recovered from 5MF6255.

Table 5. Charred Macrobotanical Remains from 5MF6255.

Sample Context			Propagule and Plant Parts		Wood	
Sample #	Feature	Provenience	*Chenopodium / Amaranthus*	Total	*Artemisia* spp.	Total
S 6	3	146N, 199E; 197-225 CMBD	10	10		10
S 57	2	147N, 200E; 200-207 CMBD	4	4	20	20
S 77	11	146N, 206E			9	9
S 79	10	146N, 205-206E; 171-177 CMBD S 1/2			20	20
S 82	12	141N, 204E;161-171 CMBD; E 1/2			12	12
S 110	14	147N, 204-205E; W 1/2, 171-197 CMBD			20	20
S 114	UNK	146N, 206E; 160-175 CMBD; SE CORNER			20	20
Total			14	**14**	101	**52**

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APPENDIX H

Faunal Analysis Methods, Faunal Analysis, and Analysis Codes

by

Jennie Borresen Lee

Metcalf Archaeological Consultants, Inc.

Wheat Ridge, Colorado

ZOOARCHAEOLOGICAL METHODS

by

Jennie Borresen Lee

Metcalf Archaeological Consultants, Inc.

The WIC Piceance Basin Lateral faunal remains were identified by Jennifer Borresen Lee using comparative specimens in the possession of the author, along with osteological collections housed at the University of Colorado Museum in Boulder, the University of Wyoming in Laramie, and the Denver Museum of Nature and Science. Specifically, identification and confirmation of fetal artiodactyl remains and several small mammal and bird specimens was aided by collections at the University of Wyoming, Anthropology Department, Comparative Osteology Museum in Laramie and at the Denver Museum of Nature and Science. Published sketches and data were also utilized for fetal bone identification (e.g., Olsen 1964, Prummel 1987). Except in the case of ground squirrels, taxonomic identification of mammal remains follows Burt and Grossenheider (1980); bird taxonomy is based on Udvardy (1990) and reptile/amphibian taxonomy follows Hammerson (1999). In the case of ground squirrel remains, the generic name *Spermophilus* rather than *Citellus* was used to maintain consistency between this faunal report and others from the region (see Burt and Grossenheider [1980:xviii] for a short taxonomic history of *Spermophilus*/*Citellus*). All species with modern and historic distributions in northwestern Colorado, northeastern Utah, and southwestern Wyoming were considered (see Armstrong 1972).

Analysis of the archaeofauna utilized a tripartite coding system of element, portion, and segment adapted from Todd (1987:Table 5.2). Among the characteristics recorded for each identifiable specimen were side, fusion, diagnostic landmarks, and various surface modifications. Analysis data was entered into the relational database, Microsoft Access 2007. All bone fragments were counted, weighed, and size-graded. Size grading was originally introduced by Ahler (1986) as a quantitative tool for lithic analysis but also provides an effective tool for illustrating the degree of bone fragmentation in an archaeofauna when it is used in conjunction with weight and/or count data. The horizontal aperture measurements for each size grade (SG) are provided in Table 1. A SG 1 fragment is one that will not pass through 25.0 mm mesh, a SG 2 fragment will not pass through 12.5 mm mesh, and so on. For each archaeofauna, count and weight data is provided for the four size grades. Additional analysis is restricted to all SG3 and larger specimens and any SG4 or smaller bone that is identifiable to genus/species or skeletal element. In the case of the SG4 material, long bone fragments are considered non-identifiable.

Identifications of individual specimens were made to the highest possible taxonomic category. Such categories generally encompass the Class level (e.g., Mammalian, Aves), the Order level (e.g., Artiodactyla, Lagomorpha, Rodentia), and the genus and/or species level (e.g., *Bison bison*). If specimens could not be identified to genus, arbitrary size groupings were used (e.g., Brain 1981, Thomas 1969). Examples of such groupings include mammal body size classes (BSC) I, II, III, and IV. Sorting into such groups can provide useful information not apparent when fragments unidentifiable beyond genus/species are disregarded. Examples of those animals most likely to be represented by each BSC (based on the project's location) are provided in Table 2. BSC I subsumes Thomas' (1969) Class I, II, and III, encompassing a broad range of mammals, from voles to jackrabbits. Given the presence of several identifiable bone fragments in the assemblages, all large mammal bone fragments (i.e., BSC IV and BSC III/IV) are presumed to be bison.

Taxonomic diversity is presented for each site archaeofauna as a whole and separate tabulations are sometimes provided for inter-site analytical units as defined by the site investigator. Two basic quantitative methods (NISP and MNI) were employed to obtain a clearer understanding of the archaeofauna. NISP is the total count of identified specimens, or fragments, per species or group as well as per element (Lyman 1994:100). MNI is the minimum number of animals necessary to account for all identified specimens and is calculated based on the most frequently occurring element or element part. At sites with significant remains from a single taxon, measures of skeletal part survivorship (MNE, MAU, and %MAU) were used to evaluate relative frequency, butchery patterns, bone transport, and/or bone destruction. The minimum number of elements (MNE) is based on overlapping skeletal landmarks, with the landmark occurring most frequently providing the MNE for that particular skeletal element. MNE can be presented by side or as a comprehensive sum. The element with the highest MNE value by side provides the MNI for the assemblage. Minimum animal unit (MAU) is calculated by dividing the MNE by the number of times the element occurs in the skeleton. Dividing the element MAU by the maximum MAU provides the %MAU. A detailed discussion of the strengths and weaknesses of each quantitative tool is provided in Grayson (1984). For the present project, MNI values are provided for each site's faunal assemblage as a whole and; in some cases, individual analytical units as well.

Taphonomy

Archaeofaunas from the region are typically an amalgamation of culturally and non-culturally modified bone. It is not uncommon to find that raptors, carnivores, weather, and other non-cultural taphonomic processes have significantly affected a site's faunal remains in terms of taxonomic diversity, element survivorship and surface modifications. They can mask or obliterate evidence of cultural modification and, in so doing, make it difficult to understand the role (if any) that humans played in the formation of the assemblage.

All specimens were macroscopically examined for surface modifications. Criteria for distinguishing culturally-affiliated bone from natural bone generally followed Lubinski (2000:Table 3.3). Non-human taphonomic processes like abrasion, polish, weathering, and root etching were not systematically recorded but were noted when present and/or atypical to the rest of the assemblage. All analyzed bone fragments were coded for the presence or absence of burning. Gnawing, carbonate, and butchery marks were noted on all fragments when present; otherwise, fragments were assigned a code of "none observed" for each of these modification types. Specimens yielding evidence of butchery or gnaw marks were studied more closely with a 10X hand lens.

A note about fossorial and semi-fossorial mammals. A number of fossorial or semi-fossorial species are present in the archaeofaunas, including rabbit, pocket gopher, ground squirrel, chipmunk, prairie dog, and voles. With the exception of rabbits, these species are generally considered intrusive at archaeological sites rather than a product of cultural activity, and much work has been done on the affect they can have on buried archaeological assemblages in terms of artifact redistribution and destruction (e.g., Bocek 1986; Erlandson 1984; Johnson 1989; Wood and Johnson 1978). However, ethnographic and ethnohistoric records suggest rodents were often utilized as a food resource by prehistoric humans (see Shaffer 1992). As a result, many archaeologists now pay closer attention to their remains in faunal assemblages and have recognized some useful patterns for determining if they are present due to cultural or non-cultural activity (e.g., Driver 1985; Falk and Semken 1990; Shaffer 1992; Szuter 1991). With these studies in mind, unless rabbit and rodent remains are present in high numbers and/or exhibit obvious proof of human modification (e.g., burning, butchery, breakage), they are generally assumed to be intrusive to the sites reported herein.

Main Goals of the Faunal Analyses

Analysis of the faunal remains was aimed at answering questions related to subsistence, seasonality, settlement patterns, intra-site spatial variability, and site function (Metcalf 2005:Table 4). The identification and quantification of animal species (taxonomic diversity) in each archaeofauna was done in an effort to understand patterns in subsistence behaviors and/or dietary preferences. In addition to providing useful information about diachronic change in diet in the region, when used in conjunction with other aspects of a particular site, such data can be useful for determining length of site occupation and, to some degree, number of site occupants.

Seasonality assessments based on faunal material were attempted whenever possible. Bone breakage patterns also lent supporting evidence. The use of fetal animal remains as a seasonality indicator relies on the discrete gestation and birthing periods of ungulate species. If fetal remains are present in an archaeofauna, occupation of the site occurred sometime during the gestation period. Comparison of fetal archaeological remains with those of known-age fetuses can narrow down the window of occupation. Similarly, knowledge of discrete birthing periods can be used jointly with tooth eruption and wear patterns observed on archaeological material to calculate the age and season of death of an animal. Dentition was not used for the current study owing to a lack of suitable specimens.

Table 1 Size grade designations.

Size grade	Mesh size
1	25.0 mm
2	12.5 mm
3	5.6 mm
4	2.8 mm

Table 2 Mammal body size classes.

Size Class	Weight	Examples
I	<6 kg	vole, ground squirrel, rabbit, prairie dog, gopher, fox
II	6-25 kg	coyote, bobcat, badger, dog
III	25-150 kg	deer, pronghorn, bighorn sheep, wolf
IV	>150 kg	bison, elk, moose

FAUNAL REMAINS FROM SITE 5MF6255

INTRODUCTION

A total of 8,618 bone specimens (655.9 g) comprise the 5MF6255 archaeofauna. Of these, 3,547 were included in the analysis (i.e., they are diagnostic to skeletal element or taxa or they are SG3 or larger). Faunal remains were recovered from all areas of the site and are particularly prevalent within and adjacent to four house features (Features 15, 17, 18, and "Anteroom") (Figure 1). At minimum, the remains of five cottontails, 12 jackrabbits, one chipmunk, three ground squirrels, one prairie dog, 11 pocket gophers, one pocket mouse, one deer mouse, one woodrat, and three voles were identified in the assemblage (Table 3). A probable pronghorn astragalus and an artiodactyl tibia shaft fragment are also present, as well as additional specimens consistent in size with all mammal body size classes. The assemblage is dominated by small bone fragments (SG3 and SG4), which is likely due to the predominance of small mammal taxa (Table 4). All of the identified taxa inhabit the area today and some may be intrusive to the site.

Twenty-six bone fragments consistent in size with medium mammals (e.g., deer/pronghorn) were identified, including a probable pronghorn astragalus and a medium artiodactyl tibia fragment. With the exception of three fragments, the remains were recovered from the southeastern portion of the excavation block, largely in and around Feature 18 and the Anteroom, although only six fragments are directly associated with the two features.

Leporid remains include both cottontail and jackrabbit. An MNI of five cottontails is based on left astragali, and an MNI value of 12 for jackrabbits is based on left humeri. Of note is that the entire jackrabbit upper forelimb (scapula, humerus, radius, and ulna) is present in comparable numbers (Table 5). MNE values for all three long bone elements (both sides) are 10 or 11, and the scapula MNE is 9 for the right side. This may reflect the presence of individual carcasses. Axial element MNE values are much lower; an MNE of 2 and 4 is suggested by the crania and mandible, respectively. The paucity of these elements may relate to their fragility (particularly the skull) or could be the result of some other taphonomic process. One unusually large jackrabbit calcaneus suggests two species may be present (e.g., *Lepus townsendi* [whitetail jackrabbit] and *L. alleni* [antelope jackrabbit]).

Jackrabbit remains were collected all over the site but are particularly prevalent around Features 9, 12, and 13 in House Feature 18, and Features 2, 3, and 4 in House Feature 17 (Figure 2). Many of those remains are burned. Cottontail remains are more localized but were recovered from all of the main house features (Figure 3). Similar to the jackrabbit, cottontail remains are associated with Features 3 and 4 in House Feature 17, and Feature 9 in House Feature 18. Many of those remains are burned. With regard to the jackrabbit remains recovered from House Features 17 and 18, the burned elements tend to be limb bone ends rather than shafts, suggesting they are cultural (e.g., roasted over a fire) (Hockett and Bicho 2000). A total of 118 limb bone ends are among the two feature's jackrabbit remains, and 56 of these (47%) are burned. Shaft fragments comprise approximately 22% of the feature's remains (n=66) and 41 of those are burned, including radius, femur, and tibia fragments. The burned shaft specimens and unburned limb ends may indicate differential processing of the jackrabbit carcasses, or that limb bones were discarded in the fire after consumption.

Rodent remains include chipmunk, ground squirrel, prairie dog, pocket gopher, pocket mouse, deer mouse, woodrat, and vole. Most of the rodent remains are free of the carbonate rind/patches noted on other specimens. Further, several of the small rodent taxa are represented solely by cranial and/or mandibular specimens, including pocket mouse, woodrat, and vole. These specimens are considered intrusive to the assemblage. Chipmunk, prairie dog, and deer mouse remains are limited to one innominate, one radius, and one humerus, respectively; all three specimens are considered intrusive to the assemblage. An MNI of three ground squirrels is based on left innominates. However, skeletal size differences suggest there are possibly three species of ground squirrel present in the assemblage (e.g., *Spermophilus tridecemlineatus* [thirteen-lined ground squirrel], *S. elegans* [Wyoming ground squirrel*],* and *S. variegatus* [rock squirrel]). The latter is represented by a tibia shaft fragment and a complete innominate. Possible thirteen-lined ground squirrel specimens are restricted to two crania, one mandible, and one femur. The remaining specimens are most consistent with the Wyoming ground squirrel. If considered as separate species, the ground squirrel MNI increases to five (two thirteen-lined, two Wyoming, and one rock squirrel).

The majority of the gopher remains from 5MF6255 were collected from the southeast portion of the excavation block, in and around House Feature 18 and, to a lesser degree, the "Anteroom" (Figure 4). No clustering immediately suggestive of individual carcasses was noted, although several units contained multiple gopher bones. Remains are prevalent around all the features in the house and "Anteroom," which may reflect human processing of carcasses or a tendency for gophers to seek out these areas (e.g., organic-rich, disturbed sediment). Cranial elements provide an MNI of 11. Postcranial specimens are also present but in lower numbers; the highest postcranial MNE value is four (right femora and left innominates). Although none of the specimens are burned or otherwise modified, the large number of remains warranted taking a closer look to determine if they might be the result of human predation. Shaffer (1992) models skeletal element frequencies for rodents in several scenarios. He suggests natural die-off should result in complete or near complete skeletons and/or a predominance of complete elements, whereas death by raptors (i.e., owls) should produce a comparable or greater number of femora relative to mandibles, and consumption by carnivores should typically result in digestive etching on the bone specimens. According to Shaffer (1992), culturally-derived gopher assemblages contain a greater number of cranial and mandibular fragments compared to postcranial elements, possibly as a product of their removal prior to consumption. Experimentation with screen mesh size indicates ¼" screen should result in the recovery of complete crania, mandibles, scapulae, innominates, and femora, and possibly lumbar vertebra and tibiofibulae (Shaffer 1992:687). While side MNE values suggest the 5MF6255 gopher assemblage meets the expected ratio of crania to postcranial elements for a cultural origin, when side is ignored, skeletal element frequencies are very similar. Table 6 provides the number of complete specimens of the five skeletal elements Shaffer (1992) suggests should survive ¼" screening. With the exception of the scapula, they are present in near identical frequency. This, together with the lack of any direct evidence of human modification to the bone (e.g., burning), suggests the remains are intrusive to the site.

The most abundant modification affecting the archaeofauna as a whole is burning (Figure 5). It is present on 1,705 fragments (48%), and the majority of these are unidentified small mammal (n=1,275, 75%). With the exception of one woodrat tooth and three rodent specimens, leporid (rabbit) remains are the only positively identified taxa exhibiting burning. This, together with similar patterning in the distribution of burned bone and burned leporid bone, suggests the majority of the burned small mammal remains are leporid. Six specimens in the archaeofauna are spirally-fractured, including one artiodactyl tibia shaft fragment and five medium mammal long bone shaft fragments. Carbonates are common on the leporid remains while much of the rodent material is free of it, indicating the former are associated with the cultural deposits while the latter are more likely intrusive to the site.

House Feature Discussion

Feature 15

A total of 290 bone fragments were recovered from Feature 15. Of these, 140 are burned. The remains of one cottontail, two jackrabbits, one pocket gopher, one mouse, unidentified rodent, small mammal, and medium mammal are included in the remains. The majority of the burned specimens were concentrated in the southern part of the house (Figure 5) and are unidentified small mammal (n=103, 74%); the only positively identified burned remains were 13 leporid (rabbit) specimens.

Feature 17

A total of 534 bone fragments were recovered from Feature 17. Of these, 339 are burned; burned remains were concentrated around Features 2 and 4. Cottontail and jackrabbit were the only positively identified taxa in the feature; a minimum if two jackrabbits and two cottontails are represented. Additional Leporidae, small mammal and unidentified mammal fragments were also present, and the majority of the burned remains are small mammal (n=153, 45%) or unidentified mammal (n=147, 43%).

Feature 18

A total of 465 bone fragments were recovered from Feature 18. Of these, 179 are burned. Feature 18 is the most taxonomically diverse of the four features discussed here. The remains of two cottontails, two jackrabbits, one ground squirrel, one prairie dog, two pocket gophers, one mouse, unidentified rodent, small mammal, and medium mammal were collected. The majority of the burned remains were concentrated in the southern part of the house and are unidentified small mammal (n=140, 78%), followed by leporids (n=30, 17%). Cottontails and jackrabbits are the only positively identified taxa that exhibit burning (n=179, 38%), suggesting the other species are intrusive to the feature.

Anteroom

A total of 104 bone fragments were recovered from the "Anteroom" feature. Of these, 53 are burned; although present throughout the feature, no clustering of burned remains was noted. The remains of one cottontail, one jackrabbit, one ground squirrel, one pocket gopher, unidentified rodent, small mammal, and medium mammal were collected. As with the other features discussed, the majority of the burned specimens are unidentified small mammal (n=35, 66%). Cottontails and jackrabbits are the only positively identified taxa that exhibit burning (n=7, 13%), suggesting the other species are intrusive to the feature.

SUMMARY DISCUSSION

Radiocarbon assays indicate site 5MF6255 dates to the early Archaic (Pioneer period). The majority of the 5MF6255 faunal remains are leporid (rabbit), and rabbit exploitation appears to be a subsistence focus of the site's inhabitants. Burning is present on over half of the rabbit and rabbit-sized bones. Pocket gopher remains are also prevalent but evidence suggests they are intrusive to the site. Only a limited number of larger mammal remains, including a probable pronghorn astragalus, is present in the assemblage. Although common in other archaeological sites in the area, artiodactyl species (e.g., deer, pronghorn, bison) did not play a major subsistence role at 5MF6255.

Bone distribution closely mirrors distribution of the house and interior house features. This, together with the heavily fragmented rabbit bone, suggests rabbits were processed within the houses and, more specifically, adjacent to interior features. The carcasses may have been roasted over the fires, the meat consumed, and the long bones then processed for marrow and/or bone grease.

In terms of leporid procurement, the animals may have been hunted individually on an as-needed basis or they could have been procured in a single communal event. Communal rabbit drives are described ethnographically for Great Basin and Southwestern groups (Lubinski 2003:207; Shaffer and Gardner 1995), and they were often conducted when family groups came together for seasonal activities. Such drives were common in areas where smaller species comprised much of the available animal biomass. Rabbits provided pelts for winter robes and blankets and, contrary to popular belief, rabbit protein and fat yields per ounce are similar to those of larger game animals (Hockett and Bicho 2000:721). Their ubiquity and ease of capture results in high caloric return rates, and rabbit meat is richer in several vitamins and minerals than deer meat. Further, they are relatively easy to process; their carcasses can be transported whole from kill sites and they can be disarticulated with or without the use of a cutting tool. Given their respective behaviors, jackrabbits are more conducive to being driven than are cottontails. The latter were more likely hunted singly (e.g., with traps, snares, or during encounter hunting) given their preference for areas with significant cover to hide from predators rather than eluding predators with speed, as is the tendency with jackrabbits (Shaffer and Gardner 1995:15).

The 5MF6255 faunal assemblage suggests the site is a short-term camp. The assemblage is not large and the frequency of the predominant prey species (jackrabbits and cottontails) indicates few people would have been sustained for long. As Reed and Metcalf (1999) have suggested, the Archaic in the Northern Colorado Basin is characterized by periodic and abrupt adaptive changes. Focused procurement of rabbits at the site may have resulted from limited availability of other resources (e.g., artiodactyls) due to seasonality or broader climatic conditions. Alternatively, rabbits may have been specifically targeted for other reasons entirely, such as the acquisition of pelts in preparation for winter.

MODIFIED BONE

One modified bone specimen (MNWC 2009.013.454) was collected during the 5MF6255 investigations. It is a patterned bone awl recovered from the screen during excavation of the "Anteroom" (AU4) (Figure 6). The artifact is made on a medium or large mammal long bone shaft fragment and measures approximately 124 mm long by 10 mm wide by 9 mm thick. It is very fragile and heavily encrusted with carbonate on all surfaces, which is masking any indication of surface modification. Excavation activities broke the awl into seven pieces. Prior to that, carbonate accumulation on some of the fracture surfaces indicates it was in three pieces. Initial fragmentation may have been the cause of the artifact's abandonment or it may have broken subsequent to human occupation of the site. The carbonate accumulation on the fracture surfaces is less thick than on the other surfaces of the tool, suggesting it may have remained complete for some time following site abandonment. At some point, it then fractured (perhaps due to moisture fluctuations in the soil, freeze/thaw episodes, soil compression, animal trampling). Alternately, the fact that the carbonate accumulation is less dense on the fracture surfaces may be a product of the surface itself, e.g., perhaps carbonates accumulate more slowly on uneven fracture surfaces or the individual pieces remained tightly together and inhibited carbonate development. Interestingly, the tip itself shows the least amount of carbonate accumulation. This may relate to the smoothing and polishing necessary to make the tapered end (i.e., the smooth surface makes it difficult for minerals to adhere to the bone surface).

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Table 3. Taxonomic diversity, including NISP values for the three house features and the anteroom, 5MF6255.

Taxon	Common Name	NISP*	MNI	House Fea 15	House Fea 17	House Fea 18	Ante - room
Family Leporidae	rabbits, hares	24	-	3	9	6	-
Sylvilagus sp.	cottontail	45	5	5	5	11	2
Lepus sp.	jackrabbit	299	12	19	43	51	13
Order Rodentia	rodents	61	-	4	-	22	3
Eutamias sp.	chipmunk	1	1	-	-	-	-
Spermophilus sp.	ground squirrel	22	3	-	-	10	4
Cynomys sp.	prairie dog	1	1	-	-	1	-
Thomomys talpoides	Northern pocket gopher	102	16	1	-	27	4
Perognathus sp.	pocket mouse	2	1	-	-	-	-
Family Cricetidae	mice, rats, lemmings, voles	7	-	2	-	2	-
Peromyscus sp.	deer mouse	1	1	-	-	-	-
Neotoma sp.	woodrat	2	1	-	-	-	-
Microtus sp.	vole	11	3	-	-	-	-
Order Artiodactyla	even-toed ungulates	1	-	-	-	-	-
cf. *Antilocapra americana*	pronghorn	1	1	-	-	-	-
mammal, BSC I	mouse/squirrel/rabbit-sized	2418	-	155	307	303	67
mammal, BSC II	coyote/badger/pronghorn-sized	1	-	-	-	-	-
mammal, BSC II/III	coyote/pronghorn/deer-sized	19	-	2	-	-	5
mammal, BSC III	deer/pronghorn-sized	22	-	-	-	1	6
mammal, BSC III/IV	deer/bison-sized	2	-	-	-	-	-
mammal, BSC IV	bison-sized	1	-	-	-	-	-
unidentified mammal		500	-	99	170	30	-
unidentified		4	-	-	-	1	-
	TOTAL	3547	45	290	534	465	104

*NISP does not include non-diagnostic SG4 bone.

Note: rather than NISP values, the counts for the six mammal BSCs, unidentified mammal, and unidentified categories more appropriately reflect NSP (number of specimens) values (Lyman 2008). They are included in this table to provide a quick reference about the nature of the archaeofauna as a whole.

Table 4. Faunal size grade data, 5MF6255.

SG	Count	%count	Weight (g)	%weight
1	5	0.1%	29.4	4.5%
2	96	1.1%	89.0	13.6%
3	2023	23.5%	317.6	48.4%
4	6494	75.4%	219.9	33.5%
TOTAL	8618	100.0%	655.9	100.0%

Table 5. Jackrabbit (*Lepus* sp.) skeletal element abundance, 5MF6255.

	Element	Code	NISP	Left	Right	n	MNE	MAU	%MAU
Cran-ial	Crania	CRN	22	1	2	0	3	1.5	12.0%
	Mandible	MR	11	1	4	1	6	3.0	24.0%
Axial	Atlas	AT	0	-	-	-	0	0.0	0.0%
	Axis	AX	0	-	-	0	0	0.0	0.0%
	Cervical Vertebra	CE	0	-	-	0	0	0.0	0.0%
	Thoracic Vertebra	TH	0	-	-	0	0	0.0	0.0%
	Rib	RB	13	5	1	0	6	0.2	1.7%
	Lumbar Vertebra	LM	0	-	-	0	0	0.0	0.0%
	Sacrum	SA	0	-	-	0	0	0.0	0.0%
Appedicular	Scapula	SC	19	4	5	1	10	5.0	40.0%
	Humerus	HM	38	12	10	3	25	12.5	100.0%
	Radius	RD	29	9	10	1	20	10.0	80.0%
	Ulna	UL	32	11	10	1	22	11.0	88.0%
	Metacarpal I	MCI	0	0	0	0	0	0.0	0.0%
	Metacarpal II	MCII	0	0	0	0	0	0.0	0.0%
	Metacarpal III	MCIII	0	0	0	0	0	0.0	0.0%
	Metacarpal IV	MCIV	1	0	1	0	1	0.5	4.0%
	Metacarpal V	MCV	0	0	0	0	0	0.0	0.0%
	Innominate	IM	5	2	3	0	5	2.5	20.0%
	Femur	FM	32	2	1	5	8	4.0	32.0%
	Patella	PT	1	0	1	0	1	0.5	4.0%
	Tibia	TA	47	7	8	1	16	8.0	64.0%
	Fibula	FIB	1	0	0	1	1	0.5	4.0%
	Astragalus	AS	10	7	3	0	10	5.0	40.0%
	Lateral Malleolus	LTM	0	0	0	0	0	0.0	0.0%
	Calcaneus	CL	13	5	4	0	9	4.5	36.0%
	Metatarsal I	MTI	0	0	0	0	0	0.0	0.0%
	Metatarsal II	MTII	3	2	1	0	3	1.5	12.0%
	Metatarsal III	MTIII	3	1	2	0	3	1.5	12.0%
	Metatarsal IV	MTIV	2	1	1	0	2	1.0	8.0%
	Metatarsal V	MTV	0	0	0	0	0	0.0	0.0%
	Phalanx 1	PHF	2	0	0	1	1	0.1	1.0%
	Phalanx 2	PHS	0	0	0	0	0	0.0	0.0%
	Phalanx 3	PHT	2	0	0	1	1	0.1	1.0%
	TOTAL (ID bone)		286						
	Indeter. Vertebra	VT	1						
	Indeter. Carpal	CP	1						
	Indeter. Metacarpal	MC	2						
	Indeter. Tarsal	TR	3						
	Indeter. Metatarsal	MT	1						
	Indeter. Metapodial	MP	3						
	Indeter. Phalanx	PH	2						
	TOTAL (all bone)		299						

Note: Cranial left and right values are based on element portions that occur on both sides of the skull or mandible (e.g., zygomatic, maxilla, individual teeth).

Table 6. Frequency of complete (unbroken), pocket gopher skeletal elements illustrating comparable survivability of the five elements Shaffer (1992) suggests should survive ¼" screening, 5MF6255.

Skeletal Element	# of Complete Specimens
Crania	5
Mandible	7
Scapula	1
Innominate	5
Femur	5

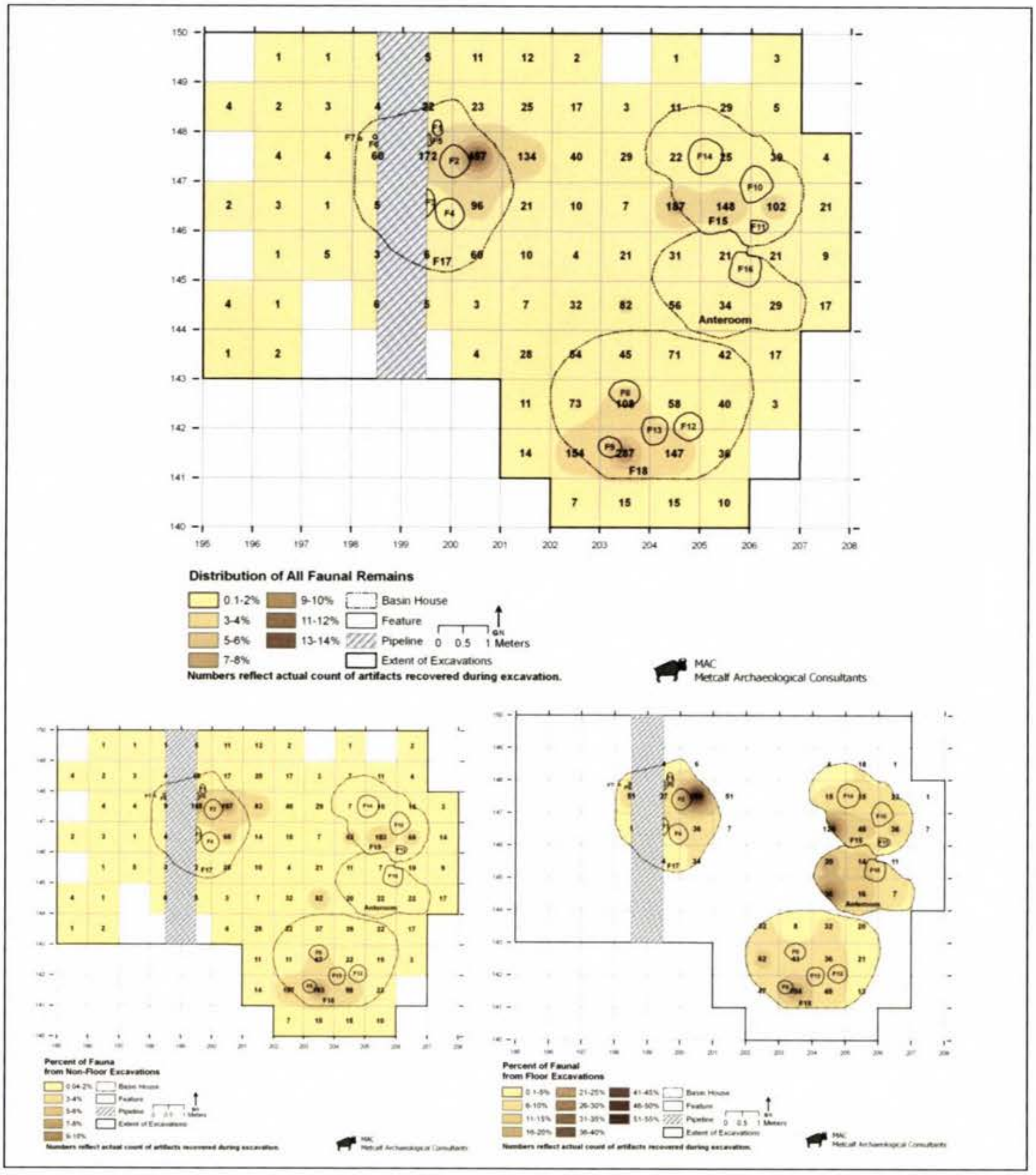

Figure 1. Distribution of faunal remains, 5MF6255. Top map shows all remains, bottom left shows remains from non-floor excavations, and bottom right shows remains from house floor excavations.

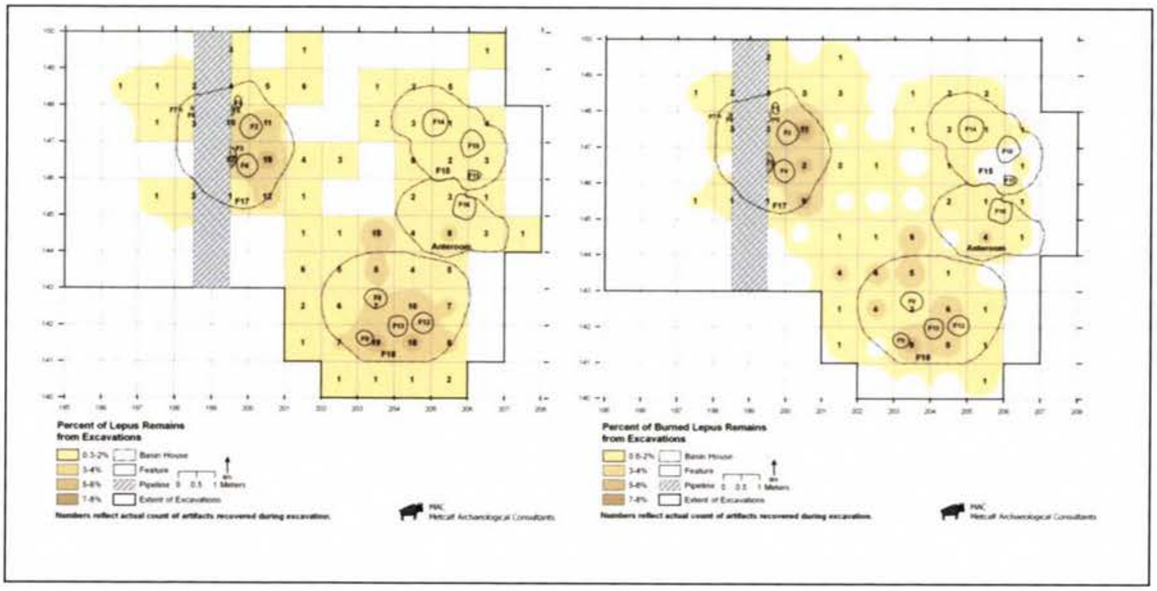

Figure 2. Jackrabbit (*Lepus* sp.) bone distribution, 5MF6255. Map on left shows all jackrabbit bone, map on the right shows burned jackrabbit distribution.

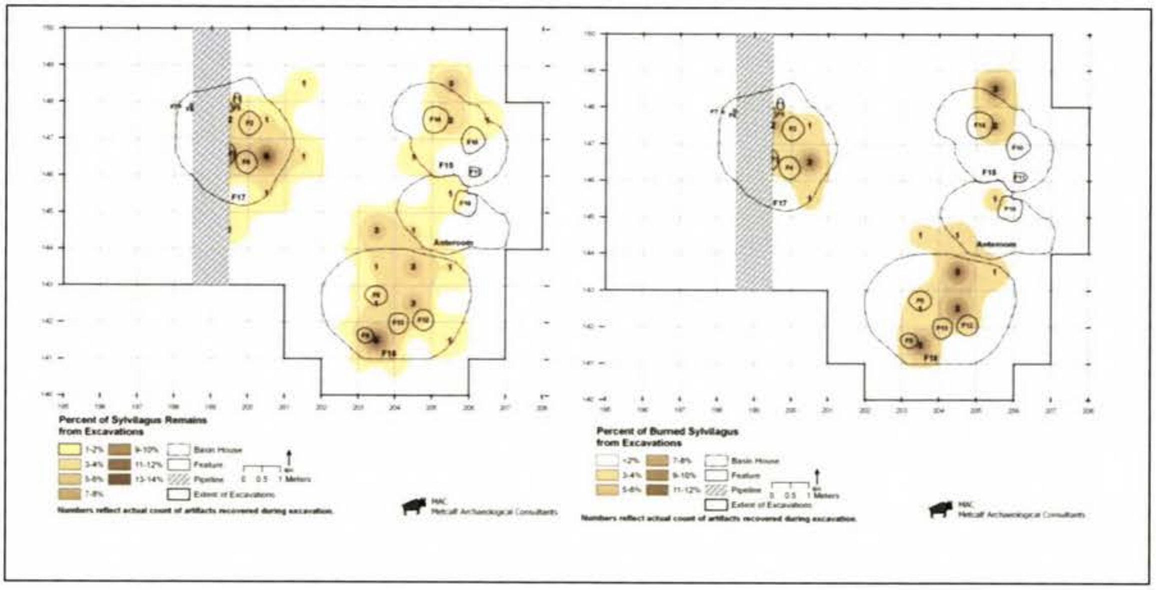

Figure 3. Cottontail (Sylvilagus sp.) bone distribution, 5MF6255. Map on left shows all cottontail bone, map on the right shows burned cottontail distribution.

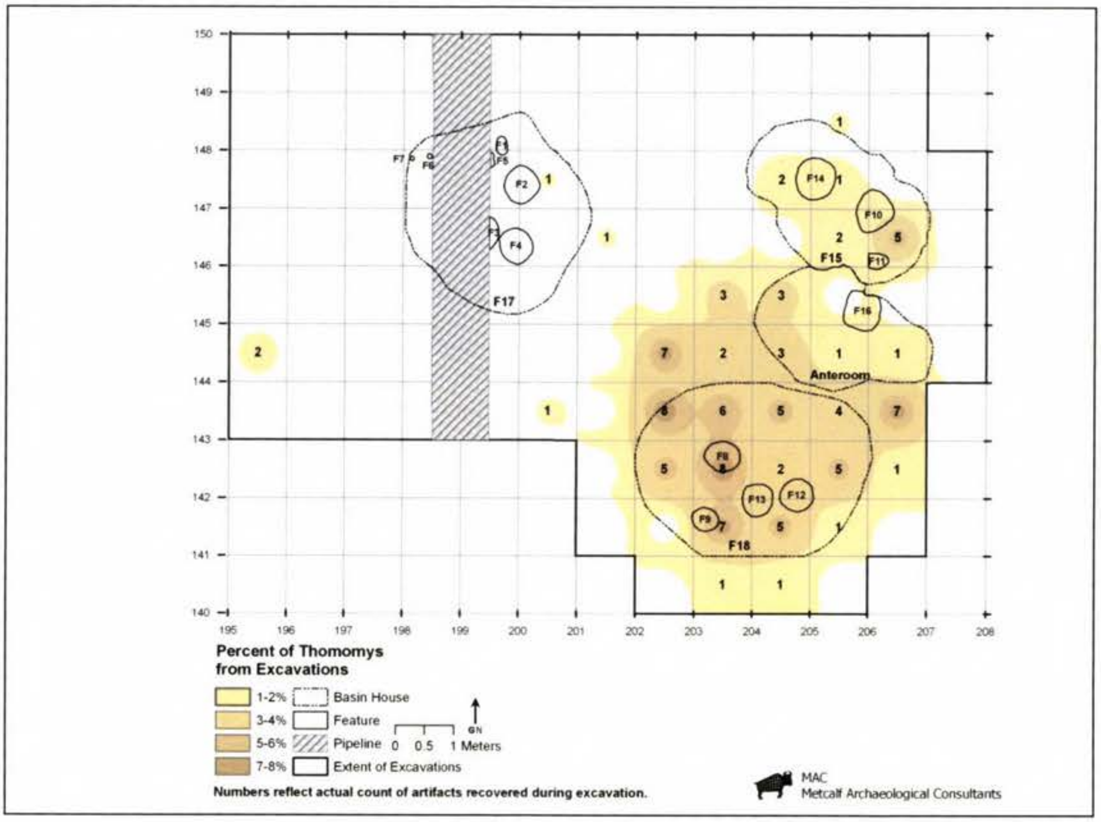

Figure 4. Northern pocket gopher (*Thomomys talpoides*) bone distribution, 5MF6255.

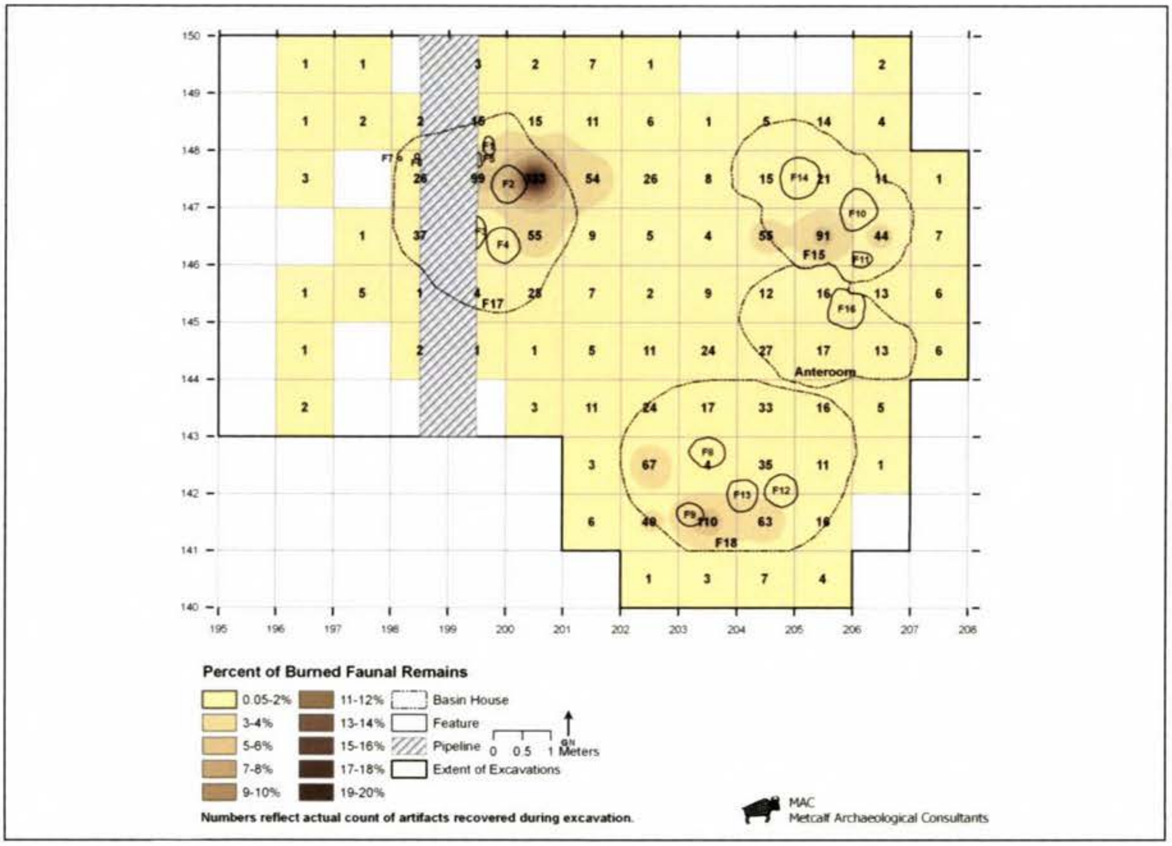
Percent of Burned Faunal Remains
0.05-2%
3-4%
5-6%
7-8%
9-10%
11-12%
13-14%
15-16%
17-18%
19-20%
Basin House
Feature
Pipeline
Extent of Excavations
0 0.5 1 Meters
F15
F17
F18
Anteroom
Numbers reflect actual count of artifacts recovered during excavation.
MAC
Metcalf Archaeological Consultants

Figure 6. Bone awl (MNWC 2009.013.454), 5MF625

Appendix H Faunal analysis coding format used for the WIC Piceance archaeofaunas.

ELEMENT CODES (ELE)

Cranium/Teeth

CRN	cranium	MR	mandible
DPUN	indeterminate decisuous premolar	MUN	indeterminate molar
HS	horn sheath	PUN	indeterminate premolar
HY	stylohyoid	TFR	indeterminate tooth fragment

Axial

AT	atlas vertebra	RB	rib
AX	axis vertebra	SA	sacral vertebra
CA	caudal vertebra	SAC	sacrum
CE	cervical vertebra	SN	sternal element
CS	costal cartilage	TH	thoracic vertebra
LM	lumbar vertebra	VT	indeterminate vertebra
MN	manubrium		

Appendicular (Forelimb)

CP	indeterminate carpal	HM	humerus
CPA	accessory carpal	MC	metacarpal
CPF	4th carpal	MCF	5th metacarpal
CPI	intermediate carpal	RD	radius
CPR	radial carpal	RDU	radius-ulna
CPS	fused 2nd and 3rd carpal	SC	scapula
CPU	ulnar carpal	UL	ulna

Appendicular (Hindlimb)

AS	astragalus	PT	patella
CL	calcaneus	PV	complete pelvis
FM	femur	TA	tibia
LTM	lateral malleolus	TR	indeterminate tarsal
IM	innominate	TRC	fused central and 4th tarsal
MT	metatarsal	TRF	1st tarsal
MTS	2nd metatarsal	TRS	fused 2nd and 3rd tarsal

Other Appendicular

DEW	accessory phalanx	PHT	3rd phalanx
MP	indeterminate metapodial	SE	indeterminate sesamoid
PH	indeterminate phalanx	SED	distal sesamoid
PHF	1st phalanx	SEP	proximal sesamoid
PHS	2nd phalanx		

Fragments

CB	indeterminate cancellous bone	LB	indeterminate long bone
FB	indeterminate flat bone	UN	unidentified fragment

PORTION CODES (POR)

Long Bone

BL	blade of scapula or rib	EP	epiphysis
CDL	condyle	FK	flake, <½ circumference of shaft
CO	complete	HE	head
DDS	distal diaphysis	IFC	impact cone
DF	diaphysis	IFK	impact flake
DFD	DS + DSE	PR	proximal end
DFP	DF + PRE	PRE	proximal epiphysis
DPR	proximal diaphysis	PRS	proximal, articular end plus < ½ shaft
DS	distal end	PSH	proximal, articular end plus > ½ shaft
DSE	distal epiphysis	SH	long bone shaft
DSH	distal, articular end plus > ½ shaft	US	unspecified
DSS	distal, articular end plus < ½ shaft		

Cranium

BRC	braincase	NSL	nasal
BSL	basilar	OCC	occipital
DP2-4	deciduous maxillary premolar	PAL	palatine
EN	tooth enamel	PAR	parietal
FN	frontal	PET	petrosal
HC	horn core	P2-4	maxillar premolar #
HS	horn sheath	PUN	indeterminate maxillary premolar
INV	incisive	SKO	other combination
JUG	jugal process	SR	skull roof (FN + HC)
LC	lacrimal	TMP	temporal
M1-3	maxillary molar #	TW	tooth row
MUN	indeterminate maxillary molar	ZYG	zygomatic
MX	maxilla		

Mandible

ANG	angle	HRM	horizontal ramus
BDR	distal border	IC	incisor
CP	condylar process	P2-4	mandibular premolar #
CRD	coronoid process	M1-3	mandibular molar #
DAM	DRM + RAM	MUN	indeterminate mandibular molar
DIC	deciduous incisor	PUN	indeterminate mandibular premolar
DP2-4	deciduous mandibular premolar	RAM	ascending ramus
DRM	dentary ramus	SYM	symphysis
EN	tooth enamel	TW	tooth row

Stylohyoid

ANG	angle	BOD	body

Vertebra

AEP	anterior epiphysis	CNW	atlas, CN + wings
AP	articular process	CNT	CN + TSP
CN	centrum	DSP	dorsal spinous process
CAN	CN + AP	NAS	neural arch + spine
CNN	CN + neural arch	PEP	posterior epiphysis
CNS	CN + dorsal spine	TSP	transverse spinous process

Scapula

CRB	cranial border	GNB	GN + blade fragment
CBD	caudal border	GS	GN + spine
GN	glenoid		

Ulna

ANC	trochlear notch portion	SH	shaft
OLC	olecranon portion		

Innominate

AC	acetabulum	IS	ischium
ACL	AC + IL	ISC	ischium (cranial)
ACP	AC + PB	ISD	ischium (caudal)
ACS	AC + IS	PB	pubis
IL	ilium	PBS	pubis symphysis
ILC	ilium (cranial)	VPT	ventral pubic tubercle
ILD	ilium (caudal)		

SEGMENT CODES (SEG)

AL	anterolateral	HD	hind
AM	anteromedial	HE	head
CD	caudal (posterior)	IN	interior
CDL	condyle	LT	lateral
CO	complete	ME	medial
CR	cranial (anterior)	PL	posterolateral
DR	dorsal	PM	posteromedial
DS	distal	PR	proximal
EN	tooth enamel	SP	spine
EX	exterior	TW	tooth row
FO	fore	VN	ventral
FR	fragment	US	unspecified
HB	split rib blade	#	vertebra/rib/tooth

SIDE CODES

A	axial	N	not sided
L	left	R	right

EPIPHYSEAL FUSION CODES (FUS)

0	unfused	3	complete fusion
1	partially fused	4	broken, indeterminate
2	fused, line visible	5	not applicable (e.g., proximal metapodial, tooth, petrous portion

BISON ELEMENT LANDMARKS

Axial

MR (mandible)

L1	coronoid process	L9	P3
L2	articular condyle	L10	P2
L3	mandibular foramen	L11	lower border
L4	angle	L12	diastema
L5	M3	L13	mental foramen
L6	M2	L14	symphysis
L7	M1	L15	incisor (n=)
L8	P4		

HY (hyoid)

L1	angle	L2	body

AT (atlas)

L1	ventral tuber	L5	right intervertebral facet
L2	dorsal tuber	L6	left intervertebral facet
L3	right cranial artic.surf	L7	right caudal artic facet
L4	left cranial artic.surf	L8	left caudal artic.facet

AX (axis)

L1	dorsal spine	L5	right transverse process
L2	dens (cranial artic.surf)	L6	left transverse process
L3	right caudal artic.surf	L7	centrum
L4	left caudal artic.surf		

CE 3-7 (cervical vertebrae 3-7)

L1	dorsal spine	L4	transverse processes
L2	cranial artic processes	L5	centrum
L3	caudal artic processes		

TH 1-14 (thoracic vertebrae 1-14)

L1	dorsal spine	L4	transverse processes
L2	cranial artic processes	L5	centrum
L3	caudal artic processes		

LM 1-5 (lumbar vertebrae 1-5)

L1	dorsal spine	L4	transverse processes
L2	cranial artic processes	L5	centrum
L3	caudal artic processes		

SA (sacrum)

L1	segment I	L5	segment V
L2	segment II	L6	right wing
L3	segment III	L7	left wing
L4	segment IV		

RB (rib)

L1	head	L3	proximal blade
L2	tubercle		

Forelimb

SC (scapula)

L1	prox superior border	L6	distal superior border
L2	prox inferior border	L7	distal inferior border
L3	nutrient foramen	L8	neck
L4	spine	L9	coracoid process
L5	acromion	L10	glenoid cavity

HM (humerus)

L1	lateral tuberosity	L8	prox olecranon fossa
L2	medial tuberosity	L9	coronoid fossa
L3	head	L10	lateral epicondyle
L4	neck	L11	medial epicondyle
L5	deltiod tuberosity	L12	lateral condyle
L6	teres major tuberosity	L13	medial condyle
L7	posterolateral foramen		

RD (radius)

L1	lateral glenoid cavity	L7	midanterior shaft
L2	medial glenoid cavity	L8	distal posterior shaft
L3	prox posterior shaft	L9	distal anterior shaft
L4	radial tuberosity	L10	CPR facet
L5	posterolateral foramen	L11	CPI facet
L6	midposterior shaft		

UL (ulna)

L1	proximal epiphysis	L5	proximal shaft
L2	olecranon process	L6	midshaft
L3	anconeal process	L7	styloid process
L4	articular facets		

MC (metacarpal)

L1	CPS facet	L5	anterior foramen
L2	CPF facet	L6	posterior foramen
L3	anterior shaft	L7	medial condyle
L4	posterior shaft	L8	lateral condyle

Hindlimb

IM (innominate)

L1	ilium blade	L5	ischium shaft
L2	ilium shaft	L6	ischium tuberosity
L3	ilio-ischial border	L7	pubis shaft
L4	acetabulum	L8	pubic symphysis

FM (femur)

L1	head	L6	posterolateral foramen
L2	greater trochanter	L7	supracondyloid fossa
L3	minor trochanter	L8	proximal trochlea
L4	anterior shaft	L9	medial condyle
L5	linea aspera	L10	lateral condyle

TA (tibia)

L1	tibial tuberosity	L7	distal posterior shaft
L2	medial condyle	L8	distal anterior shaft
L3	lateral condyle	L9	medial groove
L4	anterior crest	L10	lateral groove
L5	posterolat foramen	L11	LTM facet
L6	prox posterior shaft		

CL (calcaneus)

L1	proximal epiphysis	L4	talus facet
L2	proximal shaft	L5	LTM facet
L3	sustentaculum	L6	TRC facet

MT (metatarsal)

L1	TRC facet	L5	anterior foramen
L2	TRS facet	L6	posterior foramen
L3	anterior shaft	L7	medial condyle
L4	posterior shaft	L8	lateral condyle

PHF, PHS, PHT (phalanges 1-3)

L1	proximal	L3	distal
L2	medial		

SURFACE MODIFICATIONS

Breakage

0	complete	4	impact cone
1	spiral	5	indeterminate
2	dry	6	not recorded (e.g., field discard)
3	recent		

Burning

0	none	2	calcined
1	carbonized		

Other Modifications

0	none	6	polish
1	digested	7	abrasion
2	carbonate layer/patch(es)	8	weathering (e.g., code if heavy)
3	staining	9	root etching
4	conchoidal flake scar	10	gnaw marks (describe type in commen
5	butchery (describe type in comments)	11	combination (describe in comments)

5MF6255 Faunal Data

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
750	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
750	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
750	Lepus sp.	IM	ACS	CO	R	4	1	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N	0	5	2	
836	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	0	
836	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
783	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
783	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
802	mammal 3/4	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
802	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
802	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
802	Thomomys sp.	HM	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	0	5	2	
820	mammal 3	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
820	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
820	mammal	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
820	Lepus sp.	UL	OLC	CO	L	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
821	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
822	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
824	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
824	mammal	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
824	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
824	Thomomys sp.	MR	SYM	CO	L	0	1	N	N	N	N	N	N	N	Y	N	N	N	Y	Y	Y	Y	0	5	0	no carbonate; intrusive?
824	mammal 3	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	1	2	
826	Lepus sp.	RD	PR	CO	R	5	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
826	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
834	Lepus sp.	HM	DSS	CO	L	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	0	5	2	
835	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
838	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
838	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
838	Lepus sp.	FM	SH	ME	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
840	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
840	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
494	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
494	Lepus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
494	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
523	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
523	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
693	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
714	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
564	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
564	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
566	mammal 1	UN	US	FR	N	4	32	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
566	mammal 1	UN	US	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
566	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
566	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
566	Lepus sp.	MT	DSH	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
566	Lepus sp.	CRN	PAL	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	w/ both pairs of IC's
566	mammal 1	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
568	mammal 1	UN	US	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
568	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
568	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
568	mammal 1	UN	US	FR	N	4	26	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
568	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
568	Lepus sp.	TA	DSS	CO	R	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	0	5	2	
568	Lepus sp.	RB	HE	CO	R	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
571	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
572	mammal 1	UN	US	FR	N	4	36	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
572	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
572	mammal 1	RB	BL	CO	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
572	mammal 1	MP	DS	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	micromammal
572	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	micromammal
573	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
694	mammal 1	IM	IL	FR	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
694	mammal 1	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
656	mammal 2	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
657	mammal 1	LB	SH	FR	N	4	14	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
657	mammal 1	LB	SH	FR	N	4	13	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
657	mammal 1	UN	US	FR	N	4	10	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
657	mammal 1	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
657	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
657	Lepus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burn-ing	Break-age	Other Mod	Comments
657	Sylvilagus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
659	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
660	Artiodactyla	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	1	2	
661	mammal 1	UN	US	FR	N	4	24	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
661	mammal 1	UN	US	FR	N	4	19	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
661	mammal 1	LB	SH	FR	N	4	14	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
661	mammal 1	LB	SH	FR	N	4	14	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
661	Lepus sp.	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
661	Lepus sp.	HM	DSS	CO	L	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	0	5	2	
661	Lepus sp.	TA	DSS	CO	L	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	1	5	2	
661	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
661	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
661	Lepus sp.	HM	DS	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	1	5	2	
661	Sylvilagus sp.	IM	ACL	CO	R	4	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
661	Lepus sp.	TA	DS	FR	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
661	Sylvilagus sp.	CRN	TFR	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	mammal 1	UN	US	FR	N	4	22	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	mammal 1	UN	US	FR	N	4	10	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
664	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	mammal 1	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	mammal 1	FB	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	Lepus sp.	RB	PRS	CO	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	Lepus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	Neotoma sp.	IM	ACL	FR	L	4	1	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	Thomomys sp.	CRN	IC	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
664	Lepus sp.	RD	PRS	CO	L	5	1	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
664	Lepus sp.	RD	PRS	CO	L	5	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
664	Lepus sp.	TA	DS	CO	R	4	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	1	5	2	
664	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
664	Lepus sp.	HM	DS	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	1	5	2	
664	Lepus sp.	HM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
664	Lepus sp.	RB	PR	CO	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
665	mammal 1	CRN	SR	FR	A	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	mammal 1	UN	US	FR	N	4	34	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
665	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	mammal 1	UN	US	FR	N	4	11	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
665	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
665	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
665	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	mammal 1	LB	SH	FR	N	4	12	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
665	Rodentia	RD	SH	CO	N	4	1	N	N	Y	N	N	Y	Y	Y	Y	N	N	N	N	N	N	0	5	2	cf. Cynomys sp. but not a match
665	Sylvilagus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	Sylvilagus sp.	AS	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
665	Lepus sp.	TR	CO	CO	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	Sylvilagus sp.	CRN	IC	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	Thomomys sp.	MR	P4	CO	R	5	1	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	0	5	2	
665	Thomomys sp.	MR	MUN	CO	N	5	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	Thomomys sp.	MR	IC	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	
665	Spermophilus sp.	MR	CO	CO	L	0	1	N	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	0	5	2	
665	Thomomys sp.	MR	SYM	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	0	5	2	
665	Thomomys sp.	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	
665	mammal 1	CRN	PAL	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	mammal 1	MR	SYM	FR	R	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
665	Cricetidae	TA	CO	CO	L	3	1	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	mouse size
665	Rodentia	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
667	mammal	UN	US	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
667	Lepus sp.	HM	DS	CO	R	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	0	5	2	
668	Lepus sp.	FM	SH	PR	R	4	1	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
669	Lepus sp.	AS	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
692	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
692	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
778	mammal	UN	US	FR	N	4	11	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
778	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
778	mammal	UN	US	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
778	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
778	Lepus sp.	RB	PRS	CO	L	4	1	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
778	Lepus sp.	RB	BL	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
778	Rodentia	MR	IC	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	cf. Eutamias sp.
778	Lepus sp.	TR	CO	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	similar to entry 115 (FS665)

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
434	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
434	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
444	Lepus sp.	TA	DS	LT	R	3	1	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	0	5	2	
444	mammal 1	UN	US	FR	N	4	20	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
444	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
444	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
758	mammal	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
758	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
758	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
760	mammal	UN	US	FR	N	4	10	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
760	mammal	UN	US	FR	N	4	65	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	Sylvilagus sp.	CRN	TFR	FR	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	Lepus sp.	PHT	CO	CO	N	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	mammal 1	VT	EP	CO	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	Lepus sp.	CP	CO	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
760	Lepus sp.	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
760	Lepus sp.	MC	PSH	CO	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	Lepus sp.	UL	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
760	mammal 1	CRN	ZYG	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
599	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
599	mammal 1	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
492	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
492	Thomomys sp.	SC	GNB	CO	R	3	1	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	0	5	0	
528	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
528	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
530	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
530	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
532	Perognathus sp.	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
532	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
532	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
600	mammal 1	UN	US	FR	N	4	26	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
600	mammal	UN	US	FR	N	4	29	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
600	Thomomys sp.	MR	CO	CR	L	0	1	N	N	N	N	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	0	5	0	
600	mammal 1	LB	SH	FR	N	4	18	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
600	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
600	Lepus sp.	TA	SH	PL	R	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
600	Rodentia	LB	SH	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	mouse size
730	mammal 1	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
730	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
730	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
730	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
730	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
731	Lepus sp.	IM	ACL	CO	L	4	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	0	5	2	
732	mammal	UN	US	FR	N	4	12	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
732	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
732	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
774	mammal	UN	US	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
774	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
806	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
806	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
627	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
629	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
631	mammal 1	LB	SH	FR	N	4	9	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
631	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
631	Rodentia	HM	DSH	CO		4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. S. tridecemlineatus or T. talpoides
632	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
632	mammal 1	LB	SH	FR	N	4	11	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
728	mammal 1	UN	US	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
728	mammal 1	UN	US	FR	N	4	21	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
728	Thomomys sp.	FM	CO	CO	R	3	1	Y	Y	Y	N	N	N	Y	Y	Y	Y	N	N	N	N	N	0	5	2	
728	Thomomys sp.	MR	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	
728	Thomomys sp.	TA	PRS	CR	R	4	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
728	Thomomys sp.	TA	DSH	CO	R	4	1	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	
761	mammal 1	UN	US	FR	N	4	11	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
761	mammal 1	UN	US	FR	N	4	10	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
761	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
761	Leporidae	TFR	US	FR	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
761	Rodentia	RD	PRS	CO	N	4	1	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	cf. Cynomys sp. but smaller
781	mammal 3	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	1	2	
793	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
793	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
793	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
851	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
851	Rodentia	TFR	IC	FR	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
852	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
855	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
856	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
860	mammal 1	UN	US	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
872	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
872	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
872	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
872	Leporidae	TFR	CO	CO	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
244	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
244	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
159	mammal 1	LB	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
162	Lepus sp.	RD	PSH	CO	L	5	1	Y	Y	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	0	5	2	
163	Rodentia	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
63	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
86	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
56	mammal 1	UN	US	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
56	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
56	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
56	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
60	mammal 1	UN	US	FR	N	4	14	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
60	mammal 1	UN	US	FR	N	4	31	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
60	Lepus sp.	RD	SH	CO	N	4	1	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	1	5	2	
60	Lepus sp.	MP	DSH	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
60	Lepus sp.	FM	HE	CO	L	3	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
61	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
4	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
4	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
6	mammal 1	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
6	mammal 1	UN	US	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
6	mammal 1	LB	SH	FR	N	4	11	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	mammal 1	UN	US	FR	N	4	46	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	mammal 1	UN	US	FR	N	4	33	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
8	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	mammal 1	CRN	ZYG	FR		4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	mammal 1	CRN	ZYG	FR		4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	mammal 1	LB	SH	FR	N	4	14	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
8	Lepus sp.	HM	DS	CO	R	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	1	5	2	
8	Sylvilagus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	Sylvilagus sp.	CL	PSH	CO	L	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	Rodentia	HM	DSH	CO		3	1	N	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	0	5	2	S. lateralis size
8	Lepus sp.	MT	PRS	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MT IV
8	Lepus sp.	MT	PR	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	MT IV
8	Lepus sp.	PH	DSH	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
8	Lepus sp.	FM	SH	CR	L	4	1	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	0	5	2	
8	Lepus sp.	CL	US	FR	R	4	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	definitely bigger than other CL but check size against comparable
33	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
33	mammal 1	UN	US	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
33	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
33	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
33	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
33	Lepus sp.	TA	DSS	CO	L	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	0	5	2	
33	Lepus sp.	UL	PR	CO	L	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
33	Lepus sp.	TR	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
33	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
70	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
93	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
210	mammal	UN	US	FR	N	4	22	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
210	mammal	UN	US	FR	N	4	16	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
210	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
210	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
210	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
224	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
224	mammal	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
224	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
224	Thomomys sp.	MR	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	
227	Sylvilagus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
227	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
227	mammal 1	LB	SH	FR	N	4	11	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
227	mammal 2/3	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
227	mammal	UN	US	FR	N	4	20	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
227	mammal	UN	US	FR	N	4	16	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
294	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
295	mammal	UN	US	FR	N	4	28	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
295	mammal 1	LB	SH	FR	N	4	11	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
295	mammal 1	UN	US	FR	N	4	59	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
295	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
295	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
295	Lepus sp.	RD	PR	CO	L	5	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
295	Lepus sp.	HM	DS	ME	R	3	1	N	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	1	5	2	
298	mammal 1	UN	US	FR	N	4	20	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
298	mammal 1	LB	SH	FR	N	4	36	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	mammal	UN	US	FR	N	4	131	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	mammal 1	PH	DSH	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
298	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
298	mammal 1	TFR	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
298	Lepus sp.	TA	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	Lepus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
298	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	Leporidae	MT	CO	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	0	2	MT III; nuttali and townsendii are same size
298	Lepus sp.	PH	PSH	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	Lepus sp.	RD	PRS	CO	L	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	Leporidae	CL	PRS	CO	R	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
298	Leporidae	HM	HE	CO	N	0	1	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	Leporidae	CL	PSH	CO	R	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	Leporidae	MP	PR	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	Leporidae	MT	PRS	CO	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MT III; nuttali and townsendii are same size
332	mammal 1	UN	US	FR	N	4	36	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
332	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
332	mammal 1	LB	SH	FR	N	4	18	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
332	Leporidae	HM	DSS	CO	L	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	1	5	2	audubonii or townsendii
332	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
332	mammal 1	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
332	Leporidae	PHS	CO	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
332	Leporidae	MT	PRS	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MT II
332	Lepus sp.	UL	OLC	CO	R	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
334	mammal 1	UN	US	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
334	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
204	mammal 3	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
205	mammal	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
208	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
208	mammal 1	RB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
208	mammal 2/3	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
208	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
208	mammal 1	UN	US	FR	N	4	23	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
208	mammal	UN	US	FR	N	4	43	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
269	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
269	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
434	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
434	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
444	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
444	mammal 1	LB	SH	FR	N	4	20	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
599	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
758	mammal	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
758	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
272	mammal 1	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
272	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
274	mammal 1	UN	US	FR	N	4	12	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
274	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
274	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
274	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
274	mammal 1	UN	US	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
277	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
277	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
351	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
351	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
351	Lepus sp.	HM	DS	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
351	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
351	Rodentia	FM	HE	CO	L	3	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. Thomomys sp.
353	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
353	Lepus sp.	TA	DS	CO	L	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	1	5	2	
377	mammal 1	UN	US	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
377	mammal 1	UN	US	FR	N	4	14	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
381	Thomomys sp.	MR	DRM	FR	R	0	1	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	0	5	2	
382	Thomomys sp.	MR	DRM	FR	R	0	1	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	0	5	2	
382	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
432	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
432	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
736	Lepus sp.	TA	DS	CO	R	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	1	5	2	
736	Lepus sp.	TA	DS	ME	R	4	1	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	1	5	2	
736	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
736	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
737	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
737	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
755	mammal 1	RB	BL	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
755	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
755	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
549	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
551	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
551	Thomomys sp.	MR	DRM	FR	L	0	1	N	N	N	N	N	N	Y	Y	N	N	Y	Y	Y	Y	N	0	5	2	
553	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
554	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
554	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	6	
738	Sylvilagus sp.	TA	DS	CO	R	2	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	1	5	2	
738	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
739	Sylvilagus sp.	HM	DSS	CO	R	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	1	5	2	
739	Lepus sp.	FM	HE	CO	N	4	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
739	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
739	mammal 2/3	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
741	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
741	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
799	mammal 1	RD	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
799	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
621	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
623	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
624	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
689	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
689	Lepus sp.	UL	ANC	CO	R	4	1	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
689	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
689	Lepus sp.	MR	CP	CO	R	4	1	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
691	Sylvilagus sp.	UL	ANC	FR	R	4	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
691	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
734	Lepus sp.	RD	PRS	CO	L	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
752	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
754	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
795	Lepus sp.	FIB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
796	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
796	Rodentia	MP	CO	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. Thomomys sp.
861	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
865	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
868	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
422	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
422	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
422	mammal 1	HM	HE	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
234	Lepus sp.	HM	DS	CO	R	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	0	5	2	
239	Leporidae	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	nuttali and townsendii are same size
174	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
174	mammal 1	VT	CN	FR	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
174	Lepus sp.	RD	PRS	CO	R	5	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
89	Lepus sp.	SC	GN	CO	R	3	1	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	1	5	2	
89	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
110	Lepus sp.	HM	DS	FR	N	3	1	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	1	5	2	
110	mammal 1	UN	DRM	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
78	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
80	Lepus sp.	HM	DSS	CO	R	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	1	5	2	
80	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
82	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
82	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
82	mammal 1	PH	DSH	CO	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
82	Lepus sp.	FM	HE	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
82	Lepus sp.	CL	DS	FR	L	4	1	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
82	Lepus sp.	TA	DS	CR	R	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
85	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
85	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
91	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
169	Lepus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
169	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
169	mammal 1	MP	PRS	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
189	Lepus sp.	RD	PR	ME	L	5	1	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
189	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
342	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
342	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
342	Lepus sp.	CL	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	1	5	2	
342	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
345	Lepus sp.	CL	CO	CO	R	3	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	1	5	2	
345	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
345	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
345	mammal 1	CRN	ZYG	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
345	Lepus sp.	MT	PRS	CO	R	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	MT II
181	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
183	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
183	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
183	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
183	Lepus sp.	FM	SH	FR	R	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
183	Lepus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
183	Lepus sp.	TA	SH	PL	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
183	Sylvilagus sp.	RD	PRS	CO	R	5	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
183	Lepus sp.	CL	PSH	CO	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	not much of a size diff btwn nuttali and townsendii
183	Lepus sp.	PHF	CO	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
183	Lepus sp.	TA	DS	ME	R	4	1	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	1	5	2	
247	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
247	mammal 1	TFR	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
305	mammal 4	TFR	EN	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
307	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
307	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
307	Leporidae	MP	CO	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
308	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
308	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
308	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
308	unid	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
308	Neotoma sp.	CRN	M1	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
308	Leporidae	TFR	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
349	Lepus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
349	mammal 1	SN	US	FR	N	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
349	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
384	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
384	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
384	Lepus sp.	HM	DS	CO	L	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	1	5	2	
391	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
424	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
766	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
766	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
766	Leporidae	TFR	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
767	Lepus sp.	FM	HE	CO	N	4	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
461	mammal	CB	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
463	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burn-ing	Break-age	Other Mod	Comments
463	Rodentia	MR	SYM	CO	L	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	0	5	2	very small mammal
465	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
465	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
465	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
604	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
604	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
604	Leporidae	SC	BL	FR	R	4	1	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	1	5	2	
604	Cricetidae	MR	SYM	FR	L	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	0	5	2	
699	mammal 1	LB	SH	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
768	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
768	Lepus sp.	TA	DS	LT	L	3	1	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	0	5	2	
768	Lepus sp.	UL	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	0	5	2	
768	Rodentia	CRN	IC	FR	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. Eutamias sp.
769	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
769	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
769	Thomomys sp.	UN	IC	FR	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
769	Sylvilagus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
769	Cricetidae	UL	CO	CO	R	3	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	0	5	2	cf. Peromyscus sp.
769	Cricetidae	TA	SH	CO	L	4	1	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	0	5	2	cf. Peromyscus sp.
769	mammal 1	LB	SH	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
769	Rodentia	RB	BL	CO	R	4	1	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. Cynomys sp.
770	Lepus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
771	Lepus sp.	UL	ANC	CO	L	4	1	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
771	Sylvilagus sp.	CL	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	1	5	2	
771	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
771	Sylvilagus sp.	MT	PSS	CO	R	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MT III
607	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
609	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
772	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
245	mammal	CB	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
177	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
20	Rodentia	TA	PRS	FR	R	4	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. S. lateralis but smaller; no other Spermophilus are a good fit
44	Lepus sp.	TA	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
45	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
45	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
47	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
113	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
118	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
118	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
139	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
200	mammal 1	CRN	ZYG	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
200	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
248	mammal 1	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
248	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
248	Rodentia	PH	DS	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
248	Rodentia	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
248	Rodentia	TA	SH	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
255	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
255	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
379	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
493	Lepus sp.	FM	DSS	CO	L	3	1	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	0	5	2	no carbonate
610	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
330	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
330	Lepus sp.	CRN	TFR	FR	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
330	Lepus sp.	UL	OLC	CO	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
775	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
775	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
805	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
888	mammal 2/3	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
888	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
672	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
674	mammal 1	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
674	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
674	mammal	CB	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
674	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
674	Lepus sp.	RD	PRS	CO	R	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
674	Lepus sp.	UL	OLC	CO	R	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
674	mammal 3	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	1	2	
704	mammal 1	LB	SH	FR	N	4	14	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burning	Breakage	Other Mod	Comments
704	mammal 1	LB	SH	FR	N	4	13	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
704	mammal	UN	US	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
704	mammal	UN	US	FR	N	4	14	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
704	Lepus sp.	CL	US	FR	R	4	1	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
704	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
704	Lepus sp.	TA	SH	PL	L	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
704	Lepus sp.	HM	DS	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	1	5	2	
704	Lepus sp.	HM	DS	FR	L	4	1	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	1	5	2	
704	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
704	mammal 1	FB	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
705	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
705	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
705	mammal 1	LB	SH	FR	N	4	11	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
705	mammal 1	LB	SH	FR	N	4	9	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
705	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
705	Thomomys sp.	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
708	Lepus sp.	HM	DSH	CO	L	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	0	5	2	
710	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
710	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
710	Thomomys sp.	MR	SYM	FR	L	0	1	N	N	N	N	N	N	N	Y	N	N	N	Y	Y	Y	Y	0	5	2	
710	Thomomys sp.	CRN	IC	CO	R	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
710	Lepus sp.	CRN	TFR	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
710	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
710	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
780	Lepus sp.	FM	HE	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
780	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
780	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
780	mammal 1	CRN	ZYG	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
718	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
718	mammal 1	CRN	MX	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
721	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
721	mammal 1	FM	HE	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
721	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
721	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
721	mammal	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
721	Lepus sp.	RD	SH	DS	R	4	1	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	0	5	2	
721	Lepus sp.	FM	SH	CD	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
721	Lepus sp.	TA	DS	FR	L	4	1	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	0	5	2	
723	mammal 1	CRN	ZYG	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
723	Sylvilagus sp.	MR	DRM	FR	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	w/ 2 teeth
726	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
726	Lepus sp.	CRN	ZYG	FR	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
726	Lepus sp.	CRN	TFR	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
726	Thomomys sp.	IM	CO	CO	R	3	1	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	0	5	2	
726	mammal 1	CRN	ZYG	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
726	mammal 1	FM	CDL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
726	Lepus sp.	MT	PRS	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MT II
726	mammal 1	VT	DSP	FR	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
447	mammal 1	CRN	SR	FR	A	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	no carbonate
447	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	2	5	2	
447	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
447	mammal 1	CRN	US	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	premaxilla
447	Rodentia	HM	DSH	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
489	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
489	Lepus sp.	CRN	TFR	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
489	Cricetidae	MR	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	
489	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
534	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
535	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
536	mammal 3	HM	PRS	CO	L	3	1	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
536	mammal 2/3	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
536	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
536	Rodentia	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
538	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
538	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
538	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
538	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
539	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
539	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
539	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	4	carbonate not very heavy

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
539	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
539	mammal 1	CRN	US	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	premaxilla
539	Lepus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
539	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
539	Cynomys sp.	RD	PSH	CO	R	3	1	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	N	N	0	5	2	
539	Lepus sp.	MR	CP	CO	R	5	1	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
545	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	2	5	2	
545	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
545	mammal 1	CB	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	2	5	2	
545	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
545	Spermophilus sp.	HM	DF	CO	R	0	1	N	N	N	N	Y	N	N	Y	Y	N	N	N	N	N	N	0	5	2	
545	Thomomys sp.	UL	CO	CO	N	4	1	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	0	5	2	
545	Lepus sp.	HM	DS	ME	L	3	1	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	0	5	2	
547	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
547	Lepus sp.	FM	SH	PR	L	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	PR ME foramen present
547	Lepus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
547	mammal 1	TA	SH	LT	R	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
547	Rodentia	CRN	US	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	premaxilla
547	Rodentia	CRN	US	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	premaxilla
547	Rodentia	VT	CO	CO	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Rodentia	AX	CR	FR	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Rodentia	SAC	US	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Rodentia	RB	CO	CO	R	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Rodentia	VT	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Cricetidae	CRN	MX	FR	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Rodentia	CRN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Rodentia	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	auditory bulla
547	Spermophilus sp.	FM	DSE	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. S. elegans
547	Spermophilus sp.	TA	DFP	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Rodentia	FM	HE	CO		3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. Thomomys sp.
547	Thomomys sp.	TA	CO	CO	L	3	1	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	659 & 660 are a matching pair
547	Thomomys sp.	TA	PRS	CO	R	3	1	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	659 & 660 are a matching pair

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
547	Spermophilus sp.	IM	ACS	CO	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. S. elegans; 661 & 662 are a matching pair
547	Spermophilus sp.	IM	ACS	CO	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. S. elegans; 661 & 662 are a matching pair
547	Spermophilus sp.	IM	PB	FR	L	4	1	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	0	5	2	cf. S. elegans; 663 & 664 are a matching pair and may refit 661 & 662
547	Spermophilus sp.	IM	PB	FR	R	4	1	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	0	5	2	cf. S. elegans; 663 & 664 are a matching pair and may refit 661 & 662
547	Spermophilus sp.	AS	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Rodentia	TR	CO	CO	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Thomomys sp.	MUN	CO	CO	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
547	Thomomys sp.	MR	P4	CO	R	5	1	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	0	5	2	
555	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
555	Lepus sp.	HM	DS	CO	N	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	1	5	2	
557	mammal 2/3	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
557	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
557	mammal 1	TA	SH	DS	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
557	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
557	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
557	mammal 1	UL	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
557	Lepus sp.	TA	SH	CD	L	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
557	Lepus sp.	TA	SH	CD	L	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
558	mammal 1	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
558	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
558	mammal 3	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
558	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
558	Thomomys sp.	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	no carbonate
558	Spermophilus sp.	MR	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	no carbonate
558	Thomomys sp.	MUN	CO	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
558	mammal 1	CRN	SR	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
558	Thomomys sp.	CRN	MX	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
558	Lepus sp.	MR	SYM	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	0	5	2	
558	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
558	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
558	Thomomys sp.	RD	CO	CO	L	4	1	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	
558	mammal 1	MR	SYM	CO	L	0	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	0	5	0	no carbonate
558	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
558	Rodentia	VT	CO	CO	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
558	Rodentia	HM	PRE	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
561	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
561	mammal	CB	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	mammal 2/3	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
561	mammal 1	SC	GN	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	Thomomys sp.	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	Rodentia	CRN	IC	FR	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	grooved; should be able to narrow down; bigger than harvest mouse
561	Thomomys sp.	MUN	TFR	FR	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	Rodentia	MP	PRS	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	Rodentia	HM	DF	CO	L	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	Thomomys sp.	HM	DSS	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
561	mammal 1	CRN	US	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	premaxilla
578	mammal	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
578	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
578	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
578	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
578	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
578	Lepus sp.	UL	OLC	CO	R	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
578	Sylvilagus sp.	HM	DS	CO	L	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	1	5	2	
578	Rodentia	TA	PRS	FR		4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
578	Leporidae	TFR	US	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
578	Rodentia		US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
578	Rodentia	MR	SYM	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	mouse-size
652	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
652	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
652	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burn-ing	Break-age	Other Mod	Comments
652	Thomomys sp.	TA	DDS	CO	R	0	1	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	
654	mammal 1	VT	CO	CO	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
654	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
654	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
654	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
655	Lepus sp.	TA	DSS	CO	R	3	1	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	1	5	2	
508	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
508	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
508	Lepus sp.	UL	ANC	CO	R	4	1	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
508	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
508	Thomomys sp.	FM	CO	CO	R	3	1	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	no carbonate
510	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
510	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
510	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
510	mammal 2/3	CB	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
510	Thomomys sp.	MR	SYM	CO	L	0	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	0	5	2	add P4 landmark
511	Lepus sp.	TA	SH	DS	N	4	1	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	1	5	2	
511	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
511	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
511	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
511	Sylvilagus sp.	CL	US	FR	L	4	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
511	Sylvilagus sp.	MP	PRS	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
511	Lepus sp.	MR	IC	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
511	Lepus sp.	MR	CP	CO	R	4	1	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
517	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
517	mammal 1	SC	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
517	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
517	Lepus sp.	HM	DSS	CO	R	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	1	5	2	
517	Lepus sp.	UL	OLC	CO	L	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
517	Sylvilagus sp.	AS	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
517	Lepus sp.	FM	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
520	mammal 1	PH	DSH	CO	N	4	1	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
695	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
643	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
643	mammal 1	CRN	SR	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
645	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
645	mammal 2/3	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
645	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
647	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
647	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
647	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
647	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
647	Thomomys sp.	IM	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	0	5	2	
647	Thomomys sp.	IM	ACL	CO	L	4	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
647	Lepus sp.	RD	PRS	CO	R	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
647	Lepus sp.	PHF	CO	CO	N	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
647	Lepus sp.	TA	DS	ME	L	3	1	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	0	5	2	
649	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
649	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
649	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
649	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
649	Rodentia	VT	CN	CO	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
649	Thomomys sp.	CRN	MX	CO	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
649	Spermophilus sp.	HM	DDS	CO	L	0	1	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	0	5	2	entepicondylar foramen
649	Thomomys sp.	HM	DSH	CO	R	3	1	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	0	5	2	
649	Rodentia	CRN	US	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	pre-maxilla; cf. Thomomys sp.
649	Lepus sp.	CRN	TFR	FR	L	5	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
649	Leporidae	TFR	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
649	Thomomys sp.	CRN	IC	CO	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
651	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
641	Eutamias sp.	IM	CO	CO	R	3	1	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	0	5	2	cf. E. minimus
641	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
675	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
675	Thomomys sp.	MR	SYM	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	0	5	2	
677	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
213	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
435	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
212	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
98	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
100	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burn-ing	Break-age	Other Mod	Comments
264	Thomomys sp.	MR	DRM	FR	L	4	1	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	0	5	2	
229	mammal 1	LB	SH	FR	N	4	9	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
229	mammal 1	VT	CN	CR	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
229	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
229	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
229	Lepus sp.	HM	DS	CO	L	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	1	5	2	
232	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
232	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
232	Lepus sp.	SC	BL	FR	N	4	1	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	0	5	2	
232	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
232	Lepus sp.	UL	ANC	FR	L	4	1	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
232	Lepus sp.	UL	OLC	CO	R	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
232	Lepus sp.	HM	HE	CO	R	0	1	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
232	Lepus sp.	PT	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
302	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
278	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	pre-maxilla
279	Thomomys sp.	FM	CO	CO	R	3	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	0	5	2	
279	Thomomys sp.	IM	CO	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
279	Spermophilus sp.	CRN	MX	FR	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	P4; cf. S. elegans
279	Lepus sp.	MR	SYM	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	1	5	2	
282	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
282	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
282	Lepus sp.	RD	PRS	CO	R	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
282	Lepus sp.	FM	HE	FR	N	3	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
282	Lepus sp.	TA	DS	LT	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
282	Thomomys sp.	IM	ACL	CO	R	4	1	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
282	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
293	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
293	mammal 1	LB	SH	FR	N	4	10	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
293	Thomomys sp.	CRN	US	CR	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
293	mammal 1	CRN	SR	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
303	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
303	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
303	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
303	Thomomys sp.	MR	SYM	CO	L	0	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	0	5	0	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burn-ing	Break-age	Other Mod	Comments
303	Thomomys sp.	SC	CO	CO	L	3	1	N	Y	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	0	5	0	
303	Thomomys sp.	IM	CO	CO	R	3	1	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	0	5	0	
303	mammal 3	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
378	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
749	Thomomys sp.	CRN	IC	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
356	Thomomys sp.	SC	GN	CO	L	4	1	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	0	5	2	
356	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
358	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
358	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
358	Sylvilagus sp.	RD	PSH	CO	L	5	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	0	5	2	
358	mammal	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
358	Thomomys sp.	FM	PSH	CO	L	3	1	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
358	mammal 1	TFR	IC	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
362	mammal	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
362	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
362	Lepus sp.	RB	PRS	CO	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
362	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
362	Thomomys sp.	FM	CO	CO	R	3	1	Y	Y	Y	Y	Y	N	N	N	Y	Y	N	N	N	N	N	0	5	0	
362	Lepus sp.	RD	PRS	CO	R	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
362	Thomomys sp.	MR	DRM	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	0	5	0	
362	Spermophilus sp.	CRN	MX	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. S. tridecemlineatus
362	Leporidae	MT	PRS	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MT II
362	Lepus sp.	HM	SH	DS	R	4	1	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	1	5	2	
362	Lepus sp.	CL	PSH	CO	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
364	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
364	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
364	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
364	Lepus sp.	SC	GN	CO	R	4	1	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	1	5	2	
364	Lepus sp.	MC	PSH	CO	R	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MC IV
364	Lepus sp.	CL	CO	CO	L	4	1	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
364	Lepus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
364	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
355	Thomomys sp.	MR	CO	CO	L	0	1	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	0	5	0	
355	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
470	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
470	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
470	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
470	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
470	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
470	Microtus sp.	MR	DRM	CO	L	0	1	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	0	5	0	
470	Lepus sp.	VT	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
467	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
467	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
467	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	auditory bulla (1)
467	Spermophilus sp.	TA	SH	CO	L	4	1	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	0	5	10	cf. S. variegatus
468	Lepus sp.	TA	DSS	CO	R	3	1	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	
468	Lepus sp.	HM	DSS	CO	R	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	1	5	2	cf. S. townsendii and S. audubonii
468	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
468	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
468	mammal 1	HM	SH	DS	R	4	1	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	1	5	2	
468	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
468	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	pre-maxilla
468	Thomomys sp.	MR	CO	CO	R	0	3	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	0	5	0	
468	Thomomys sp.	MR	SYM	CO	L	0	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	0	5	0	
468	Thomomys sp.	CRN	MX	FR	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
475	mammal 1	LB	SH	FR	N	4	9	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
475	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
475	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
475	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
475	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
475	mammal 1	CRN	ZYG	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
475	Sylvilagus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
475	Sylvilagus sp.	HM	DSS	CO	L	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	1	5	2	
475	unid	VT	CO	CO	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
475	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
476	Lepus sp.	SC	GNB	FR	L	4	1	N	N	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N	0	5	2	
477	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
479	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
479	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
479	Sylvilagus sp.	CRN	IC	FR	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
567	Thomomys sp.	CRN	US	FR	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	premaxilla with R incisor
586	mammal 2/3	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
586	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
588	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
588	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
588	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
588	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
588	Lepus sp.	CRN	TFR	FR	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
588	Lepus sp.	RD	PSH	CO	L	5	1	Y	Y	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	0	5	2	
588	Thomomys sp.	CRN	MX	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
588	Microtus sp.	MR	SYM	CO	R	0	1	N	N	N	N	N	N	Y	N	N	N	N	Y	Y	Y	N	0	5	2	
590	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
590	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
590	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
590	mammal 1	CRN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
590	Thomomys sp.	MR	SYM	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	0	5	2	
590	Lepus sp.	CRN	TFR	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
590	Thomomys sp.	TA	DSH	CO	L	3	1	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	
590	Sylvilagus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
590	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
615	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
615	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
616	Thomomys sp.	CRN	CO	CO	A	5	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	no carbonate
618	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
618	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
618	Thomomys sp.	SC	GNB	CO	R	3	1	N	N	N	Y	N	Y	Y	Y	Y	Y	N	N	N	N	N	0	5	2	
618	Spermophilus sp.	IM	CO	CO	L	0	1	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	0	5	2	cf. S. variegatus
618	Thomomys sp.	FM	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	0	5	2	
618	Thomomys sp.	CRN	CO	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	no carbonate
618	Rodentia	CRN	FN	FR	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
618	Thomomys sp.	MR	DRM	CO	L	0	1	N	N	N	N	N	Y	Y	Y	N	N	N	Y	Y	Y	Y	0	5	0	no carbonate
678	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
72	Microtus sp.	MR	US	FR	L	4	1	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	0	5	2	
72	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
74	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
74	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
76	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
31	mammal 1	PH	CO	CO	N	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
38	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
38	Rodentia	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
40	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
40	Sylvilagus sp.	AS	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
172	mammal 1	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
172	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
201	mammal 1	PH	DSS	CO	N	5	1	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
257	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
262	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
262	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
262	Lepus sp.	UL	OLC	CO	L	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
262	mammal 1	UL	ANC	FR	R	4	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
321	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
321	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
321	Lepus sp.	UL	ANC	CR	L	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
325	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
325	mammal 3	LB	FK	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	1	2	
325	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
325	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
325	mammal 1	LB	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
326	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
326	Microtus sp.	CRN	US	CR	A	5	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
326	Thomomys sp.	MR	CO	CO	L	0	1	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	Y	Y	Y	Y	0	5	2	
326	Thomomys sp.	CRN	US	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	pre-maxilla
326	Perognathus sp.	MR	CO	CO	L	0	1	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y	Y	Y	0	5	2	
326	Thomomys sp.	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
326	Rodentia	VT	CO	CO	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
326	Thomomys sp.	UL	CO	CO	R	3	1	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	0	5	2	
326	Thomomys sp.	RD	CO	CO	R	3	1	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	
326	Thomomys sp.	HM	SH	FR	L	4	1	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	0	5	2	
326	Rodentia	CRN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
326	Rodentia	MR	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burn-ing	Break-age	Other Mod	Comments
366	mammal 1	SC	GN	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
366	mammal 1	VT	CO	CO	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
367	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
369	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
369	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
369	Lepus sp.	TA	SH	DS	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
369	Thomomys sp.	IM	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	0	5	2	
371	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
371	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
371	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
371	Lepus sp.	IM	IS	FR	R	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
371	mammal 1	PHS	CO	CO	N	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
371	Microtus sp.	MR	SYM	CO	L	0	1	N	N	N	N	N	N	Y	N	N	N	N	N	Y	Y	N	0	5	2	
371	Thomomys sp.	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
371	Lepus sp.	UL	PSH	CO	L	3	1	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
371	Lepus sp.	UL	PSS	CO	R	3	1	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
373	mammal 1	LB	SH	FR	N	4	12	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
373	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
373	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
373	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
373	Sylvilagus sp.	TFR	US	FR	R	5	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
373	Lepus sp.	CL	PRS	CO	R	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
373	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
373	Lepus sp.	HM	DS	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
373	Lepus sp.	SC	GNB	FR	R	4	1	N	N	N	N	N	N	Y	Y	N	Y	N	N	N	N	N	0	5	2	
373	Sylvilagus sp.	UL	OLC	CO	R	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
373	mammal 2/3	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
414	mammal 1	LB	SH	FR	N	4	10	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
414	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
414	Lepus sp.	UL	OLC	CO	R	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
414	Lepus sp.	FM	HE	CO	L	3	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
414	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
414	Lepus sp.	TA	DSH	CO	L	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	0	5	2	
414	Lepus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
414	Lepus sp.	MT	PSH	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	MT III

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burn-ing	Break-age	Other Mod	Comments
414	Lepus sp.	UL	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
415	Lepus sp.	TA	SH	CO	L	4	1	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	0	5	2	
416	Lepus sp.	TA	SH	PM	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
450	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
450	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
450	Thomomys sp.	MR	DAM	FR	R	0	1	N	N	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	0	5	2	large; no carbonate
450	Rodentia	CA	CO	CO	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
453	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
453	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
453	mammal 1	HM	HE	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
453	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
453	Lepus sp.	CRN	ZYG	CR	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
453	Thomomys sp.	MR	CO	CO	L	0	1	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y	Y	Y	0	5	0	large; no carbonate
455	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
455	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
455	mammal 1	UN	US	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
455	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
455	mammal 1	RB	BL	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
455	Lepus sp.	TFR	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
455	Thomomys sp.	TA	CO	CO	L	3	1	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	0	5	0	
455	Sylvilagus sp.	UL	PRS	CO	L	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
455	mammal 3	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
455	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
459	Lepus sp.	IM	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	0	5	2	
460	Lepus sp.	IM	ACS	CO	R	4	1	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	0	5	2	
763	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
411	Rodentia	VT	CO	CO	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
411	Rodentia	FM	SH	PR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
411	Thomomys sp.	MR	SYM	FR	L	0	1	N	N	N	N	N	N	Y	Y	N	N	N	Y	Y	Y	Y	0	5	0	
411	Thomomys sp.	MR	IC	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	0	
270	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
593	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
593	Lepus sp.	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
635	Thomomys sp.	CRN	CO	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	no carbonate
636	Lepus sp.	UL	PSH	CO	R	3	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
636	Lepus sp.	SC	GN	CO	R	4	5	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	4	5	2	
638	mammal 1	UN	US	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
638	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
638	Rodentia	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
786	Lepus sp.	AS	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
815	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
815	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
815	Lepus sp.	RB	PRS	CO	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
815	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
815	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
815	Lepus sp.	HM	SH	CD	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
817	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
817	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
817	mammal 3	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
817	Lepus sp.	CL	CO	CO	L	4	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	1	5	2	
817	Spermophilus sp.	UL	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	0	5	2	has carbonate
875	Lepus sp.	TA	SH	PL	L	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
639	mammal 3	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
640	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
681	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
681	Rodentia	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
683	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
683	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
683	mammal 1	SN	US	FR	A	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
814	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
814	Lepus sp.	CRN	TFR	FR	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
876	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
876	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
876	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
876	Microtus sp.	MR	CO	CO	L	0	1	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	0	5	2	
876	Lepus sp.	RB	HE	CO	L	3	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
890	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
890	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
890	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
890	Lepus sp.	HM	DSS	CO	R	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	0	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
889	Thomomys sp.	MR	DRM	CO	R	0	1	N	N	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	0	5	2	large
842	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
845	mammal 1	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
845	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
846	Lepus sp.	FM	SH	PL	L	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
846	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
848	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
848	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
879	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
882	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
883	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
883	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
143	mammal 1	HM	HE	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
143	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
143	Lepus sp.	HM	DS	CO	L	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	1	5	2	
145	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
211	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
55	Lepus sp.	HM	DS	CO	R	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	0	5	2	
55	Lepus sp.	UL	ANC	FR	R	4	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
64	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
24	mammal 1	TA	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
28	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
29	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
101	Lepus sp.	RD	PRS	CO	R	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
101	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
123	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
124	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
125	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
125	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
125	Rodentia	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
147	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
147	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
147	Lepus sp.	HM	DS	ME	R	4	1	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	1	5	2	
147	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	0	5	2	
147	Lepus sp.	FM	HE	CO	N	4	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burn-ing	Break-age	Other Mod	Comments
147	Lepus sp.	HM	HE	CO	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
147	unid	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
150	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
151	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
151	mammal 1	UN	US	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
151	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
151	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
151	Lepus sp.	HM	DS	CO	L	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	1	5	2	
153	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
154	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
155	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
266	Sylvilagus sp.	TA	DSS	CO	R	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	1	5	2	
336	Lepus sp.	TA	SH	PL	L	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
336	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
336	mammal 1	SC	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
336	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
336	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
336	Lepus sp.	SC	GN	CO	L	3	1	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	1	5	2	
336	Lepus sp.	HM	DS	FR	R	4	1	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	1	5	2	
336	Lepus sp.	UL	ANC	FR	R	4	1	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
338	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
339	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
339	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
339	Lepus sp.	MR	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	1	5	2	
339	Lepus sp.	CRN	TFR	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
339	Lepus sp.	PHT	PRS	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
216	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
250	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
250	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
251	Lepus sp.	RD	PSH	CO	R	5	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
253	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
253	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
253	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
289	mammal 1	IM	AC	FR	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
289	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
289	mammal 3	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
289	Microtus sp.	CRN	CO	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
392	Thomomys sp.	CRN	CO	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
395	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
395	Spermophilus sp.	IM	CO	CO	L	0	1	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	0	5	2	cf. S. elegans
398	Spermophilus sp.	TA	DSH	CO	L	3	1	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	
398	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
398	Leporidae	HM	SH	CR	L	4	1	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	1	5	2	
398	Thomomys sp.	MR	DRM	CO	R	0	1	N	N	N	N	N	Y	Y	Y	N	N	N	Y	Y	Y	N	0	5	2	
398	Microtus sp.	MR	DRM	CO	R	0	1	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N	0	5	2	
402	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
402	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
402	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
402	Thomomys sp.	MR	DAM	CO	L	5	1	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	N	N	N	N	0	5	0	large; no carbonate
404	cf. Antilocapra american	AS	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	pronghorn foll. Lawrence 1951; from rodent disturbance
404	Spermophilus sp.	FM	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	0	5	0	cf. S. tridecemlineatus
404	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
404	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
480	Microtus sp.	TA	CO	CO	L	3	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	0	5	2	
482	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
482	mammal 3	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	1	2	
482	mammal 3	LB	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
482	Thomomys sp.	CRN	CO	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
484	Lepus sp.	CL	CO	CO	R	4	1	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
484	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
484	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
484	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
486	mammal 1	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
486	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
486	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
486	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
486	mammal 1	SC	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
486	Rodentia	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
486	Thomomys sp.	TA	DSH	CO	R	3	1	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	0	5	0	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
486	Thomomys sp.	CRN	MX	CO	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
597	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
597	mammal 2/3	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
807	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
807	Lepus sp.	TA	DS	AL	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
502	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
524	mammal 1	CB	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
524	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
526	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
526	Lepus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
596	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
596	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
808	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
808	Lepus sp.	RD	PRS	CO	R	5	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
808	Sylvilagus sp.	AS	CO	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
612	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
614	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
684	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
684	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
686	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	
744	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
744	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
790	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
790	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
791	Spermophilus sp.	MR	CO	CO	R	0	1	N	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	Y	Y	N	0	5	0	cf. S. tridecemlineatus
791	Spermophilus sp.	CRN	MX	FR	A	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	cf. S. tridecemlineatus
791	Spermophilus sp.	CRN	US	FR	N	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	0	premaxilla w/ incisor; cf. S. tridecemlineatus
791	Rodentia	CRN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
812	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
828	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
829	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
829	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
831	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
832	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
873	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
417	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
218	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
220	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
222	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
156	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
103	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
105	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
11	Lepus sp.	AS	CO	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
11	Lepus sp.	UL	ANC	FR	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
13	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
13	Lepus sp.	UL	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
13	Lepus sp.	MP	DSS	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
14	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
14	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
14	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
14	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
14	Sylvilagus sp.	FM	DSE	CO	R	0	1	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	0	5	2	
14	Lepus sp.	HM	DS	CO	L	4	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	0	5	2	
14	Lepus sp.	UL	OLC	CO	L	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
14	Sylvilagus sp.	MT	PRS	CO	R	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	MT V
17	mammal 1	LB	SH	FR	N	4	6	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
17	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
17	Sylvilagus sp.	CRN	US	FR	A	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	premaxilla, right pair of incisors
17	Lepus sp.	UL	OLC	CO	L	3	1	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
17	Lepus sp.	UL	SH	PR	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
17	Sylvilagus sp.	CL	CO	CO	R	5	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	1	5	2	
52	Lepus sp.	SC	GN	FR	N	5	1	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	1	5	2	
52	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
52	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
52	Lepus sp.	MR	CP	CO	R	5	1	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
54	mammal 1	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
54	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
54	Lepus sp.	MR	TFR	CO	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
54	Lepus sp.	MT	PRS	CO	R	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MT III

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
106	Lepus sp.	CL	PR	CO	R	3	1	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
108	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
132	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
134	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
134	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
134	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
134	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
134	Lepus sp.	SC	GNB	FR	L	3	1	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	0	5	2	
134	Lepus sp.	UL	OLC	CO	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
136	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
137	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
138	Lepus sp.	HM	DS	CO	L	4	1	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	0	5	2	
158	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
316	mammal 1	PHF	PRS	CO	N	3	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
316	mammal 1	PHS	PRS	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
316	mammal 1	PHF	CO	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
316	mammal 1	PH	DSS	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
316	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
316	mammal 1	UN	US	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
316	mammal 1	LB	SH	FR	N	4	7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
316	mammal 1	LB	SH	FR	N	4	5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
316	Sylvilagus sp.	CL	CO	CO	R	3	1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
316	Lepus sp.	TA	SH	LT	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
316	Lepus sp.	HM	DS	CO	R	3	1	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	1	5	2	
316	Lepus sp.	SC	GN	CO	L	5	1	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	0	5	2	
316	Lepus sp.	SC	BL	PR	R	4	1	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	1	5	2	
316	Lepus sp.	SC	GN	CO	R	5	1	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	1	5	2	
316	Sylvilagus sp.	RD	PSH	CO	L	5	1	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	N	N	0	5	2	
316	mammal 1	RB	CO	CO	N	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
316	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
316	mammal 1	RB	PRS	CO	N	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
316	Lepus sp.	MT	PSH	CO	L	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	MT II; Leporidae
316	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
319	mammal 1	LB	SH	FR	N	4	8	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
319	mammal 1	LB	SH	FR	N	4	4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
319	Lepus sp.	CL	CO	CO	R	3	1	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	0	5	2	
319	Lepus sp.	HM	DS	CO	L	3	1	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	0	5	2	
319	Sylvilagus sp.	RD	PSH	CO	R	5	1	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	N	N	0	5	2	
319	Sylvilagus sp.	UL	ANC	FR	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
319	mammal 1	UN	US	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
319	Sylvilagus sp.	RD	PSS	CO	R	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
319	Lepus sp.	HM	DS	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
319	Lepus sp.	UL	OLC	CO	R	3	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
319	mammal 1	PHF	CO	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
319	mammal 1	PHS	CO	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
319	Sylvilagus sp.	TA	DS	LT	L	3	1	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	1	5	2	
319	mammal 1	MR	DRM	CO	L	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
319	mammal 1	MP	PRS	CO	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
328	Lepus sp.	AS	US	FR	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
328	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
329	Lepus sp.	TA	DSS	CR	R	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	N	N	0	5	2	
184	mammal	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
187	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
187	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
187	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
187	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
190	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
190	Lepus sp.	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
190	Lepus sp.	TA	SH	PL	L	4	1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	1	5	2	
190	Thomomys sp.	MR	IC	FR	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	
190	mammal 1	PHT	CO	CO	N	4	1	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
190	Sylvilagus sp.	RD	PRS	CR	L	3	1	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
190	mammal 1	PH	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
193	mammal 1	LB	SH	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
193	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
193	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
194	Lepus sp.	MT	CO	CO	R	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	MT III
310	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
311	Lepus sp.	FM	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
311	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Burning	Breakage	Other Mod	Comments
311	Lepus sp.	SC	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
311	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
312	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
312	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
385	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
387	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
387	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
389	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
390	mammal 1	UN	US	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
922	mammal 1	RB	BL	FR	N	4	3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
921	mammal 1	FM	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
903	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
903	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
903	mammal 1	CRN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
904	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
904	Lepus sp.	MR	CP	CO	L	5	1	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
905	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
905	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
906	Lepus sp.	UL	OLC	FR	N	4	1	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
906	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
907	Lepus sp.	MP	DS	CO	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
909	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
909	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
909	mammal 1	RB	BL	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
909	Lepus sp.	CRN	PAL	CO	R	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
909	Lepus sp.	CRN	TFR	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
909	Lepus sp.	RD	PRS	ME	R	3	1	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
910	mammal 1	RB	BL	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
911	Lepus sp.	TA	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
911	mammal 1	UN	US	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
911	Lepus sp.	HM	DS	FR	N	3	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
913	Lepus sp.	RD	PSH	CO	L	3	1	Y	Y	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	0	5	2	
913	mammal 1	LB	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
913	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
913	Lepus sp.	CRN	ZYG	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	

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FS	Taxon	ELE	POR	SEG	SIDE	FUS	count	Landmarks															Burn-ing	Break-age	Other Mod	Comments
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
913	Lepus sp.	UL	DSS	CO	L	3	1	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	0	5	2	
918	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
918	mammal 1	RD	SH	FR	N	4	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
919	mammal 1	LB	SH	FR	N	4	2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	5	2	
298	Lepus sp.	TA	DSS	ME	L	3	1	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	1	5	2	
362	Thomomys sp.	HM	SH	CO	R	4	1	N	N	N	N	Y	N	N	Y	N	N	N	N	N	N	N	0	5	2	
590	Lepus sp.	MR	TFR	FR	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
649	Rodentia	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	mouse size
705	Cricetidae	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	cf. Peromyscus sp.
710	Thomomys sp.	CRN	IC	CO	L	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	
728	Thomomys sp.	MR	IC	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	
728	Rodentia	MR	IC	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	0	5	2	cf. Eutamias sp.
326	Thomomys sp.	CRN	US	CO	R	0	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	pre-maxilla; very small but morphologically okay
326	Microtus sp.	CRN	US	CO	R	5	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	5	2	pre-maxilla
482	Peromyscus sp.	HM	DSH	CO	R	3	1	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	0	5	2	
618	Thomomys sp.	MR	DRM	CO	L	0	1	N	N	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	0	5	0	no carbonate
618	Thomomys sp.	MR	DRM	CO	L	0	1	N	N	N	N	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	0	5	0	no carbonate

APPENDIX I

Artifact Analysis Codes

by

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and

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Appendix I Tool coding format utilized for the WIC Piceance chipped stone tools

COMPLETENESS

1	complete	5	medial fragment
2	nearly complete	6	indeterminate end
3	distal end	7	margin fragment
4	proximal end	8	channel flake or fragment

TECHNOLOGICAL CLASS

1	patterned small thin biface	7	nonbipolar core/core-tool
2	patterned large thin biface	8	bipolar core/core-tool
3	unpatterned small to medium biface	9	unpatterned pecked or ground tool
4	patterned steeply beveled flake tool	10	patterned pecked or ground tool
5	unpatterned flake tool, other	11	radial break tool
6	large, thick bifacial core-tool		

USE WEAR CODES

1	abrasion (polish, striations, grinding)	5	attrition
2	step fractures	6	combination
3	scalar flake scars	7	unknown
4	crushing/battering		

REASON FOR REJECTION

1	has potential for further work or use	8	small size or exhaustion
2	bending fracture or end shock	9	indeterminate
3	perverse fracture	10	heat or thermal fracture
4	material flaw or poor quality stone	11	lateral break
5	outre-passe fracture	12	radial fracture
6	compound hinge/step occurrence	13	crescentic chunk from margin
7	impact fracture		

BLANK TYPE

1	tabular cobble/pebble (>10mm thick; w/th ration >2.5)	9	blade or bladelet
2	thin plate (thickness <10mm)	10	shatter
3	subrounded, rounded, spherical cobble or pebble	11	indeterminate
4	blocky/angular cobble or pebble (thickness >10mm; w/th ratio <2.5)	12	other nonbipolar flake from prepared core
5	split cobble	13	finished patterned biface used as blank
6	other nonbipolar flake	14	unfinished patterned biface used as blank
7	bifacial thinning flake	15	unpatterned flake tool used as blank
8	bipolar flake	16	patterned flake tool used as blank

CORE TECHNO-MORPHOLOGICAL CLASS (ctmc)

1	tested raw material with flake scars	15	freehand core, indeterminate form
2	tested raw material without flake scars	20	bipolar core, not rotated, any morphology
3	freehand tabular core	21	bipolar core, rotated, any morphology
4	freehand unprepared and irregular core	22	bipolar combined with freehand, predominately bipolar
5	freehand unprepared and regular core	23	bipolar combined with freehand, predominately freehand
8	freehand prepared cores of other form		

CORE FUNCTION (cfc)

1	tested raw material	5	blade production
2	random, generalized flake	6	linear flake production
3	thick, expanding flake	9	indeterminate
4	thin, expanding flake production		

CORE TECHNOLOGY (ctc)

1	freehand, pronounced bulb	5	bipolar recycled to freehand
2	freehand, flat or diffuse bulb	6	freehand recycled to bipolar
3	freehand, mixed bulb characteristics	7	mixed freehand and bipolar
4	bipolar	9	indeterminate freehand & TRM

CORE PLATFORM PREPARATION (cpp)

1	unprepared and cortical platform	6	faceting preparation applied to non-cortical surface
2	faceting applied to cortical surface	7	rounding preparation applied to non-cortical surface
3	founding applied to cortical surface	8	faceting and rounding preparation applied to non-cortical surface
4	faceting plus rounding applied to cortical surface	9	indeterminate or bipolar and tested raw material
5	unprepared and non-cortical (flake scar) platform		

MORPHOLOGICAL CLASS

4	ovoid biface	34	unpatterned retouched flake w/ two connecting working edges
5	ovoid, pointed biface	35	unpatterned retouched flake w/ three connecting working edges
11	ovoid biface fragment	41	unpatterned utilized flake w/ one working edge
15	indeterminate biface fragment	42	unpatterned utilized flake w/ two isolated working edges
31	unpatterened retouched flake w/ c	43	unpatterend utilized flake w/ hree isolated working edges
32	unpatterned retouched flake w/ two isolated working edges	44	unpatterned utilized flake w/ two connecting working edges
33	unpatterened retouched flake w/ three isolated working edges	61	unpatterned core tool

USE WEAR INTENSITY

L	light
M	medium
H	heavy

USE PHASE

1	unfinished, usable
2	unfinished, unusable
3	finished, usable
4	finished, unusable

FLAKE TOOL CERTAINTY (FtCert)

0	not confident artifact is a tool
1	confident artifact is a tool

CORE STAGE

1	untested bu selected cobble
2	TRM (tested raw material)
3	platform preparation, but not heavily flaked
4	one or more serious flake removals
9	indeterminate

REWORKED CODES

1	resharpened
5	scavenged and reworked

FLAKED TOOL CLASS CODES

1	tested raw material (TRM)
2	core with significant flake removal
3	patterned biface
4	flake tool
5	non-chipped tool

5MF6255 Flaked Stone Tools

FS	Class	Complete	Techclass	Morphclass	Use wear	Use wear intensity	Use phase	Reject	Material	Cortex	Blank	Rework	Multi-function	Length	Lengh (incomplete)	Width
48	3	2	1	5			4	11	13	0	11		0	3.80	FALSE	2.40
50	4	1	5	31	3	L	3	1	12	0	6		0	1.80	FALSE	2.00
59	4	1	5	41	3	L	3	1	12	0	6			3.50	FALSE	2.30
104	4	1	5	34	3	M	3	1	13	0	12		1	9.90	FALSE	4.80
104	4	2	5	42	3	M	4	11	13	0	12		1	9.90	FALSE	4.80
127	4	5	5	32			2	11	13	0	6		0	2.50	TRUE	2.70
149	4	2	5	42	6	H	4	11	13	0	9		0	7.00	FALSE	3.10
164	4	1	5	42	3	L	4	9	13	0	6		0	6.00	FALSE	3.90
173	4	1	5	41	3	H	3	1	12	0	12		0	2.60	FALSE	1.40
214	4	3	5	41	3	H	4	11	13	0	6		0	0.70	TRUE	2.00
285	3	4	1	11			4	2	12	0	11		0	0.80	TRUE	1.50
292	4	7	5	31			2	2	13	0	6		0	3.30	TRUE	2.10
304	3	2	2	4			2	9	13	1	11		0	6.00	FALSE	2.60
317	3	6	2	4			2	6	12	1	11		0	3.00	TRUE	4.10
359	4	1	5	42	3	M	3	1	13	0	7		0	5.40	FALSE	3.80
374	4	2	5	34	6	L	4	11	13	0	12		1	7.00	FALSE	4.50
374	4	1	5	43	6	M	3	1	13	0	12	1	1	7.00	FALSE	4.50
393	4	4	5	41	3	H	4	3	13	1	12		0	2.50	TRUE	2.10
397	4	1	5	41	3	L	3	1	13	0	12		0	3.50	FALSE	2.60
400	1	1	7	61			4	4	22	1	3	5	0	10.10	FALSE	8.10
418	4	2	5	34			2	2	13	0	12		1	2.80	FALSE	3.40
418	4	1	5	31	1	H	4	8	13	0	12		1	2.80	FALSE	3.40
431	4	1	5	41	6	M	3	1	12	0	6		0	3.40	FALSE	2.40
436	3	4	1	15			4	11	13	0	11		0	1.70	TRUE	2.80
451	4	2	5	42	3	H	3	1	13	0	12	1	0	5.40	FALSE	3.40

FS	Width (incomplete)	Thick-ness	Thickness (incomplete)	Gram	Angle	Bifstage	FtCert	CTMC	CFC	CTC	CPP	Platform count	Core stage	Comments
48	FALSE	0.40	FALSE	3.40	14	6	0					0		
50	FALSE	0.20	FALSE	0.60	13		0					0		heat altered
59	FALSE	0.50	FALSE	3.30	35		1					0		
104	FALSE	0.60	FALSE	24.40	48		1					0		algalitic; slotting/grooving
104	FALSE	0.60	FALSE	24.40	26		1					0		algalitic
127	TRUE	0.50	FALSE	4.20	30		1					0		burnt; algalitic; refits with FS 292 and 537
149	FALSE	0.50	FALSE	11.90	31		1					0		algalitic; scalar and step fractures
164	FALSE	0.60	FALSE	15.30	22		1					0		algalitic
173	FALSE	0.20	FALSE	0.80	18		1					0		heat altered
214	TRUE	0.20	TRUE	0.30	22		1					0		burnt
285	TRUE	0.30	TRUE	0.40	15	6	0					0		projectile point base
292	TRUE	0.60	TRUE	4.00	26		1					0		algalitic; refits with FS 127 and 537
304	FALSE	0.60	FALSE	9.30	20	3	0					0		burnt
317	FALSE	1.10	FALSE	18.00	40	2	0					0		heat altered
359	FALSE	0.60	FALSE	9.70	23		1					0		algalitic
374	FALSE	0.90	FALSE	20.50	52		1					0		algalitic; scalar and step fractures; slotting/grooving
374	FALSE	0.90	FALSE	20.50	25		1					0		scalar, attrition
393	TRUE	0.40	TRUE	2.30	18		1					0		burnt, 145N/203E L2
397	FALSE	0.30	FALSE	3.10	17		1					0		
400	FALSE	3.20	FALSE	235.00	0		0	1	1	9	9	1	2	
418	FALSE	0.50	FALSE	4.00	43		1					0		algalitic; graving/incising
418	FALSE	0.50	FALSE	4.00	46		1					0		algalitic
431	FALSE	0.50	FALSE	4.10	15		1					0		scalar, rounding
436	FALSE	0.30	FALSE	1.50	17	6	0					0		heat altered, complete notched projectile point base
451	FALSE	0.50	FALSE	8.10	29		1					0		algalitic

5MF6255 Flaked Stone Tools

FS	Class	Complete	Techclass	Morphclass	Use wear	Use wear intensity	Use phase	Reject	Material	Cortex	Blank	Rework	Multi-function	Length	Lengh (incomplete)	Width
472	4	4	5	32	3	H	4	11	13	1	6		0	3.40	TRUE	3.80
473	4	4	5	31	6	M	4	11	13	1	12	1	0	2.40	TRUE	2.30
503	3	1	2	5			2	4	15	1	9		0	6.40	FALSE	5.20
513	3	7	2	15			2	5	16	0	11		0	5.60	TRUE	2.20
514	4	4	5	32	3	M	4	11	13	1	6	1	0	4.60	TRUE	3.10
533	4	3	5	41	3	M	4	11	12	0	6		0	1.90	TRUE	2.40
537	4	3	5	32	3	M	3	1	13	0	6		0	3.00	TRUE	2.10
541	4	1	5	41	3	M	3	1	12	1	12		1	5.80	FALSE	1.80
541	4	1	5	44	6	H	3	1	12	1	12		1	5.80	FALSE	1.80
570	2	2	7	61			4	8	15	1	4		0	4.80	FALSE	4.00
585	4	3	5	42	3	M	4	11	13	1	12	1	0	4.00	TRUE	4.30
606	4	5	5	41	3	H	4	9	13	0	6		0	3.30	TRUE	3.30
622	4	4	5	42	3	H	4	11	13	0	6		0	1.70	TRUE	2.70
671	4	1	5	33	3	L	3	1	12	1	12		1	6.30	FALSE	3.10
671	4	1	5	42	3	H	3	1	12	1	12		1	6.30	FALSE	3.10
707	1	1	7	61			4	4	21	1	3	5	0	9.70	FALSE	7.70
709	4	1	5	41	3	M	3	1	13	1	12		0	4.30	FALSE	3.10
866	4	3	5	42	3	M	4	11	13	1	6		0	0.90	TRUE	1.80
870	3	1	2	4	3	L	3	1	15	0	9		0	8.90	FALSE	6.50
891	4	1	5	41	3	M	3	1	12	1	6		0	2.20	FALSE	4.30
892	4	1	5	35	3	H	4	8	13	0	6		0	3.10	FALSE	2.00

5MF6255 Flaked Stone Tools

FS	Width (incomplete)	Thick-ness	Thickness (incomplete)	Gram	Angle	Bifstage	FtCert	CTMC	CFC	CTC	CPP	Platform count	Core stage	Comments
472	TRUE	0.80	TRUE	10.80	24		1					0		
473	TRUE	0.60	TRUE	3.30	25		1					0		algalitic; rounding, scalar; refits with FS 514
503	FALSE	2.00	FALSE	63.10	35	3	0					0		
513	TRUE	0.80	TRUE	6.10	27	3	0					0		burnt
514	FALSE	0.60	FALSE	9.10	20		1					0		algalitic; refits with FS 473
533	TRUE	0.60	TRUE	3.00	30		1					0		heat-altered
537	TRUE	0.60	FALSE	5.10	35		1					0		algalitic; refits with FS 127 and 292
541	FALSE	0.60	FALSE	6.00	40		1					0		heat altered; slotting/grooving
541	FALSE	6.60	FALSE	6.00	61		1					0		heat altered, rounding, scalar
570	FALSE	1.90	FALSE	29.80	0		0	4	2	1	5	3	4	
585	TRUE	0.50	FALSE	13.80	49		1					0		algalitic
606	TRUE	0.60	FALSE	9.10	45		1					0		burnt; refits w/FS 622
622	TRUE	0.50	TRUE	2.60	32		1					0		burnt; refits w/FS 606
671	FALSE	0.60	FALSE	8.30	64		1					0		heat altered; graving/incising
671	FALSE	0.60	FALSE	8.30	24		1					0		heat altered
707	FALSE	5.60	FALSE	460.00	0		0	1	1	9	9	1	2	
709	FALSE	0.90	FALSE	8.00	35		1					0		heat altered
866	TRUE	0.10	TRUE	0.20	22		1					0		burnt
870	FALSE	2.80	FALSE	148.50	36	3	0					0		
891	FALSE	1.00	FALSE	9.40	45		1					0		heat altered
892	FALSE	0.30	FALSE	1.80	15		1					0		burnt; morph changed from 41 to 35; 2 graving/incising

Appendix I Debitage coding format utilized for the WIC Piceance debitage

FLAKE TYPE CODES

1	Shatter	6	Other complex flake
2	Bipolar flake	7	Pressure biface thinning flake
3	Percussion biface thinning flake	8	Linear flake
4	Blade	9	Ribbon flake
5	Other simple flake	10	Channel flake

MATERIAL TYPE CODES

01	chert, oolitic white/cream	33	chalcedony, medium/dark brown
02	chert, oolitic tan/light brown	34	chalcedony, black
03	chert, oolitic medium/dark brown	35	chalcedony, gray
04	chert, oolitic black	36	chalcedony, pink/red
05	chert, oolitic gray	37	chalcedony, yellow/orange
06	chert, oolitic pink/red	38	chalcedony, blue/green
07	chert, oolitic yellow/orange	39	chalcedony, other
08	chert, oolitic blue/green	40	other material, translucent
09	chert, oolitic other	41	other material, white/cream
11	chert, white/cream	42	other material, tan/light brown
12	chert, tan/light brown	43	other material, medium/dark brown
13	chert, medium brown-dark brown	44	other material, black
14	chert, black	45	other material, gray
15	chert, gray	46	other material, pink/red
16	chert, pink/red	47	other material, yellow/orange
17	chert, yellow/orange	48	other material, blue/green
18	chert, green/blue	49	other material, other color
19	chert, other color	50	quartz, translucent
21	quartzite, white/cream	51	quartz, white/cream
22	quartzite, tan/light brown	52	quartz, tan/light brown
23	quartzite, medium brown-dark brown	56	quartz, pink/red
24	quartzite, black	61	siltstone, white/cream
25	quartzite, gray	62	siltstone, tan/light brown
26	quartzite, pink/red	63	siltstone, medium/dark brown
27	quartzite, yellow/orange	64	siltstone, black
28	quartzite, blue/green	65	siltstone, gray
29	quartzite, other color	66	siltstone, pink/red
30	chalcedony, translucent	67	siltstone, yellow/orange
31	chalcedony, white/cream	68	siltstone, blue/green
32	chalcedony, tan/light brown	69	siltstone, other

CORTEX

0	present	1	absent

5MF6255 Debitage

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
516	3	12	0	6	1	0.10	
516	3	13	0	6	1	0.10	
516	4	11	0		3	0.00	
516	4	13	0		9	0.10	
673	3	15	0	6	1	0.50	
673	3	13	0	5	1	0.00	
779	3	13	0	5	2	0.30	
779	3	13	0	6	2	0.00	
779	3	16	0	6	1	0.20	
779	4	16	0		1	0.00	
779	4	31	0	7	1	0.00	
779	4	13	0		9	0.20	
779	4	12	0		5	0.00	
779	4	11	0		1	0.00	
713	3	13	0	6	1	0.30	BURNT
703	2	12	1	6	1	3.70	
703	3	13	0	6	1	0.10	BURNT
703	3	11	1	6	1	0.50	
703	3	41	1	5	1	1.50	QUARTZ
703	4	1	0		1	0.10	
703	4	16	0		1	0.00	
703	4	13	0		1	0.00	
711	3	11	0	6	1	0.60	
711	3	13	0	5	1	0.00	BURNT
711	3	13	0	6	1	0.10	BURNT
711	3	41	0	5	1	0.10	QUARTZ
711	4	11	1		1	0.00	
711	4	13	0		1	0.00	
711	4	41	0		1	0.00	QUARTZ
706	2	16	1	5	1	7.20	
706	2	13	0	5	1	1.10	
706	3	11	1	5	1	0.10	
706	3	12	0	5	1	0.10	
706	3	12	0	6	1	0.20	
706	3	13	0	5	1	0.40	
706	4	16	0		1	0.10	BURNT
658	3	16	1	5	1	1.20	
658	4	13	0		3	0.20	
662	3	13	0	6	1	0.10	
662	4	16	0		2	0.20	
666	3	13	0	6	1	0.10	

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
777	3	13	0	6	1	0.10	
777	4	1	0		2	0.10	
777	4	13	0		1	0.10	BURNT
777	4	16	0		2	0.00	
565	2	16	0	6	1	3.50	
565	3	23	0	5	1	1.20	
569	3	15	0	5	1	1.10	
569	4	15	0		1	0.10	
563	3	3	0	6	1	0.40	BURNT
563	3	13	0	6	1	0.10	
522	4	13	0		1	0.00	
522	4	16	0		1	0.00	
823	3	13	0	5	2	1.40	BURNT
839	3	13	0	6	1	0.80	BURNT
146	4	11	0	7	1	0.00	
144	3	13	0	6	1	0.50	
144	3	13	0	5	1	0.10	BURNT
144	4	13	0		1	0.10	BURNT
144	4	16	0		1	0.10	
30	1	11	0	6	1	15.50	
30	4	16	0		1	0.00	
21	4	13	0		1	0.10	BURNT
23	4	16	0		1	0.00	
27	2	11	0	6	1	8.50	
27	2	16	0	5	1	2.00	
25	4	40	0		1	0.10	QUARTZ
782	3	13	0	6	1	0.10	
803	3	13	0	5	2	0.30	BURNT
803	3	13	0	6	1	0.30	HEAT ALTERED
803	4	41	1		1	0.10	QUARTZ
126	3	23	0	5	1	0.30	
126	4	15	0		1	0.10	
335	3	30	0	5	1	0.10	
148	3	43	0	5	2	1.10	BASALT/BURNT
148	3	16	0	5	1	0.30	
148	4	13	0		3	0.20	
148	4	13	0		1	0.00	BURNT
148	4	16	0		2	0.30	
148	4	23	0		1	0.00	
148	4	26	0		1	0.00	

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
148	4	41	0		2	0.10	QUARTZ
152	2	11	1	5	1	10.40	
152	3	13	0	5	1	0.40	BURNT
152	3	25	0	5	1	0.40	
152	4	41	0		1	0.10	quartz
152	4	16	0		2	0.00	
152	4	12	0		1	0.00	
152	4	25	0		1	0.10	
337	2	11	1	6	1	2.90	
380	3	13	0	5	1	0.90	BURNT
827	3	13	1	5	1	0.40	
874	4	13	0		1	0.00	
830	4	12	0		1	0.10	
858	3	13	0	5	2	0.60	BURNT
858	4	13	0		2	0.00	
833	3	12	0	5	1	0.10	
507	3	13	0	5	1	0.80	BURNT
521	3	13	0	6	1	0.30	BURNT
521	4	13	0		2	0.10	
506	2	3	0	6	1	1.00	
506	4	13	0		1	0.00	
696	4	13	0	7	1	0.00	
696	4	13	0		4	0.10	
696	4	13	0		1	0.00	BURNT
696	4	16	0		1	0.00	
504	2	16	1	6	1	7.70	
512	2	11	0	6	1	1.50	
512	2	16	0	5	1	0.90	
512	3	16	1	5	1	1.10	
512	3	13	1	5	1	0.30	
512	3	11	0	6	2	0.80	
512	3	11	1	5	1	0.40	
512	4	45	0		7	0.20	BASALT
512	4	2	0		9	0.20	
512	4	2	1		8	0.40	
512	4	42	0		2	0.20	
512	4	42	1		1	0.00	
512	4	45	0		1	0.10	BASALT/BURNED
687	3	13	0	5	1	1.40	BURNT
687	3	13	0	6	1	0.10	BURNT

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
613	3	13	0	5	1	1.40	BURNT
688	4	16	0		1	0.00	
792	3	11	0	6	1	0.10	
792	3	13	0	5	1	0.10	BURNT
685	4	13	0		1	0.20	BURNT
685	4	13	0		1	0.10	
813	3	13	0	6	1	0.10	
813	4	16	0		1	0.00	
811	4	11	0		1	0.10	
811	4	13	0		1	0.10	BURNT
811	4	13	0		1	0.00	
500	2	13	0	5	1	2.70	BURNT
500	3	13	0	5	1	1.00	BURNT
809	4	41	0		3	0.40	QUARTZ
809	4	46	0		1	0.10	QUARTZ
788	4	13	0		1	0.10	BURNT
501	2	16	1	5	1	1.20	BURNT
497	4	13	0		1	0.10	
525	3	26	0	6	1	0.30	
483	3	31	1	5	1	0.20	
483	4	31	1		1	0.10	
483	4	41	0		1	0.00	QUARTZ
485	3	16	0	6	1	0.20	
485	4	16	0		1	0.00	
485	4	25	0		2	0.00	
485	4	13	0		1	0.00	
594	3	13	0	6	1	2.00	BURNT
598	3	11	0	6	1	0.40	
396	2	25	0	6	1	1.20	
396	4	13	0		1	0.00	
396	4	15	0		1	0.00	
403	2	25	0	5	1	1.30	
403	3	16	0	5	1	0.20	
401	3	16	0	5	1	0.80	
401	3	25	0	5	1	0.40	
401	4	25	0		1	0.00	
346	4	40	0		1	0.10	145N 203N WALL SCRAPING, quartz
394	3	43	1	5	1	2.00	PETRIFIED WOOD

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
288	3	13	0	5	1	0.10	
288	3	13	0	5	1	0.20	BURNT
288	3	23	0	5	1	0.20	
286	4	11	0		1	0.10	
215	3	31	0	5	1	0.10	
215	3	13	0	6	1	0.50	BURNT
215	3	46	0	5	1	0.20	SILT STONE
249	4	17	0		2	0.10	
249	4	13	0		1	0.10	
249	4	16	0		1	0.00	
249	4	41	0		1	0.00	QUARTZ
544	2	13	0	6	1	1.70	
544	3	13	0	6	1	0.10	
546	3	13	1	5	1	0.10	HEAT ALTERED
546	4	40	0		1	0.00	QUARTZ
540	3	16	0	5	1	1.10	
540	3	13	0	5	1	0.10	BURNT
540	3	13	0	6	1	0.10	
540	4	13	0		1	0.00	
488	3	13	0	5	1	0.20	BURNT
715	4	13	0		1	0.10	
717	4	12	0		1	0.10	
720	1	16	1	6	1	16.70	
720	2	16	1	6	1	9.40	
720	3	13	0	6	1	1.40	
719	4	13	0		1	0.10	BURNT
725	4	11	0		1	0.00	
725	4	13	0		1	0.00	
702	3	13	0	5	1	0.70	
702	3	13	0	6	1	0.20	
702	3	3	0	5	1	0.10	BURNT
702	4	12	0		1	0.00	
724	2	16	0	6	1	1.30	BANDED
724	3	13	0	5	2	0.20	
724	4	16	0		2	0.00	
724	4	13	0		1	0.00	
370	4	13	0		1	0.10	BURNT
370	4	26	0		1	0.00	
368	3	3	0	6	1	1.40	BURNT
368	4	13	0		2	0.10	

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
372	4	13	0		2	0.20	
372	4	46	0		1	0.00	QUARTZ
413	2	31	1	6	1	1.78	
413	4	43	0		1	0.00	QUARTZ
413	4	41	0		1	0.00	QUARTZ
320	2	13	0	5	1	1.70	BURNT
324	3	16	0	5	1	0.10	
324	3	23	0	6	1	0.10	
324	4	11	0		1	0.00	
324	4	11	0		1	0.10	HEAT ALTERED
259	2	13	1	6	1	3.00	
261	4	13	0		2	0.10	
261	4	12	0		1	0.00	
256	2	13	0	6	1	2.40	
256	4	46	0		1	0.10	QUARTZ
39	2	26	0	6	1	2.80	
39	3	12	0	5	1	0.10	BURNT
41	4	17	0		1	0.00	
41	4	11	0		1	0.00	
41	4	13	0		1	0.00	BURNT
73	3	11	0	3	1	0.50	
142	3	23	0	5	2	0.80	
240	3	13	0	6	1	0.10	BURNT
240	4	13	1		1	0.10	
271	3	23	0	5	1	0.20	
412	3	11	1	6	1	0.80	HEAT ALTERED
410	4	13	0		1	0.00	
619	3	32	1	5	1	0.10	
591	2	13	1	6	1	6.70	BURNT
591	4	13	0		1	0.00	BURNT
591	4	16	0		2	0.00	
589	3	13	0	6	1	0.10	BURNT
587	4	13	0		2	0.10	BURNT
587	4	13	0		1	0.10	
478	3	13	0	6	1	0.10	
478	4	40	0		2	0.00	QUARTZ
478	4	13	0		6	0.10	BURNT
478	4	12	0		2	0.00	
471	3	16	0	5	1	0.10	
469	4	23	0		1	0.10	

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
469	4	12	0		1	0.00	
474	3	16	1	5	2	0.50	
474	3	16	0	6	1	0.10	
474	3	13	0	6	2	0.60	
474	4	13	0		1	0.00	
474	4	41	0		2	0.10	QUARTZ
474	4	16	0		2	0.10	
361	3	16	1	5	1	1.80	BURNT
361	3	13	1	6	1	0.10	
361	4	13	0		1	0.00	
357	3	23	0	6	1	1.40	
354	4	23	0		1	0.10	
354	4	11	0		1	0.10	
584	3	16	0	5	1	0.20	
363	3	13	0	5	1	0.20	BURNT
363	4	13	0		2	0.10	
281	3	13	0	5	1	0.20	
281	4	16	0		1	0.00	
281	4	13	0		1	0.00	
281	4	13	1		1	0.10	BURNT
291	3	13	1	1	1	1.20	
291	4	13	0		2	0.10	
228	3	13	0	6	2	0.40	
95	3	23	0	5	1	0.20	
99	3	13	0	6	1	1.60	HEAT ALTERED
97	3	15	0	5	1	0.10	
36	3	13	0	1	1	1.30	HEAT ALTERED
37	3	13	0	5	1	0.50	BURNT
37	4	13	0		1	0.20	BURNT
65	3	13	0	5	1	0.10	
122	4	17	0		1	0.00	
402	2	11	1	5	1	4.70	
407	3	16	0	5	1	0.40	
406	4	13	0		1	0.00	BURNT
676	2	13	0	6	1	0.60	
642	3	13	0	6	1	0.20	
642	4	16	0		1	0.10	
650	4	11	1		1	0.00	
648	4	17	0		1	0.10	
648	4	16	0		1	0.10	

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
648	4	31	0		1	0.10	
648	4	13	0		1	0.10	
648	4	13	0		1	0.00	BURNT
646	1	11	1	6	1	13.20	
745	3	11	1	5	1	0.20	
745	4	11	0		1	0.20	
559	3	12	0	6	1	0.10	BURNT
559	4	40	0		1	0.00	QUARTZ
559	4	16	1		1	0.00	
559	4	13	0		1	0.00	
559	4	11	0		1	0.00	
556	3	13	0	6	1	0.70	
556	3	13	0	5	1	1.80	
579	2	41	1	5	1	3.30	quartz
579	3	13	1	5	1	0.20	
579	3	13	0	6	1	0.20	
579	3	13	0	5	1	0.00	
579	4	11	0		1	0.10	
579	4	13	0		1	0.00	
560	2	13	1	6	1	2.50	
560	4	13	0		1	0.00	
560	4	16	0		2	0.00	
560	4	11	1		1	0.00	
847	4	41	1		1	0.10	QUARTZ
844	3	23	0	5	1	0.10	
844	3	17	0	5	1	0.20	
844	3	13	0	5	1	0.10	
452	4	13	0		1	0.10	
441	4	13	0		1	0.10	BURNT
884	3	13	0	5	1	0.10	
884	4	23	0		1	0.10	
881	4	16	0		1	0.00	
857	4	13	0		1	0.10	
841	2	16	0	6	1	1.60	
841	3	11	0	6	1	0.10	
843	3	16	1	5	1	0.80	
877	3	13	0	5	1	1.30	
682	4	13	0		1	0.00	
816	3	13	0	6	1	0.20	
816	4	26	0		1	0.10	
653	4	41	0		1	0.10	QUARTZ

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FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
653	4	13	0		1	0.00	
637	3	23	0	5	1	0.30	
637	4	13	0		1	0.00	
787	4	13	0		1	0.10	
454	3	13	0	5	1	0.10	BURNT
454	3	40	1	5	1	0.20	QUARTZ
454	3	32	0	6	1	0.10	
454	3	12	1	6	1	1.10	
454	3	12	0	6	1	0.10	
454	4	31	0		2	0.10	
454	4	31	0	7	1	0.10	
454	4	16	0		1	0.00	
454	4	11	0		1	0.00	BURNT
454	4	13	0		2	0.00	BURNT
454	4	13	0		1	0.00	
764	3	26	0	5	1	0.50	
32	4	13	0		1	0.10	
32	4	16	0		1	0.00	
746	2	13	1	6	1	2.50	
449	2	13	0	6	1	0.70	
449	3	17	0	6	1	0.10	
449	3	17	0	6	1	0.10	BURNT
449	4	13	0		1	0.00	
180	3	16	0	5	1	0.20	
180	3	12	1	5	1	0.20	
246	2	26	0	6	1	1.60	
246	4	11	0		1	0.10	
246	4	11	0		1	0.10	
246	4	26	0		1	0.10	
246	4	13	0		1	0.10	
182	3	26	0	5	2	0.90	
182	3	23	0	6	1	0.50	
182	4	11	0		2	0.20	
182	4	26	0		2	0.00	
182	4	16	0		1	0.10	
383	3	11	0	6	1	0.10	
765	4	11	0		1	0.10	
306	4	13	0		1	0.10	
347	3	16	0	5	1	0.20	
347	3	13	0	5	1	0.30	
348	2	13	0	6	1	6.50	

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
605	3	11	0	6	1	0.20	
462	4	13	0		1	0.10	
462	3	26	0	6	1	1.00	
464	4	13	0		2	0.40	
608	3	16	0	6	1	0.30	
698	3	13	0	6	1	0.20	
284	3	26	0	5	1	1.30	
46	3	11	0	6	1	0.50	
43	3	16	0	6	1	0.20	
19	4	11	0		1	0.00	
117	2	41	0	6	1	2.00	QUARTZ
140	4	26	0		1	0.10	
119	2	11	1	6	1	9.40	
196	3	13	1	5	1	0.20	
199	2	26	0	5	1	8.90	
199	4	11	0		1	0.00	
254	3	26	0	5	1	0.80	
800	4	13	0		1	0.00	
344	2	16	1	6	1	11.10	BURNT
344	4	16	0		2	0.00	
341	3	11	1	5	1	0.20	
168	3	26	0	5	1	0.60	
168	3	11	0	6	1	0.10	
340	3	16	0	6	1	0.20	
188	3	26	0	5	1	0.50	
188	4	12	0		2	0.10	
188	4	13	0		1	0.00	
170	3	16	0	6	1	0.30	
170	4	16	0		1	0.20	
804	3	13	0	6	1	0.10	
804	4	46	0		1	0.10	QUARTZ
804	4	23	0		1	0.00	
887	4	13	0		2	0.00	
887	4	17	0		1	0.00	
887	4	23	0		1	0.00	
217	3	16	0	6	1	0.80	BURNT
219	3	26	0	6	1	0.30	
219	4	13	0		1	0.10	
221	2	31	1	5	1	3.30	
221	4	31	0		1	0.10	
221	4	11	0		1	0.10	

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FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
15	3	13	1	6	1	4.10	
15	4	26	0		1	0.10	
53	4	17	0		2	0.00	
53	4	13	0		1	0.10	
12	3	13	0	5	1	0.20	BURNT
10	3	13	0	6	1	0.10	
16	2	16	0	5	1	2.20	
16	2	16	0	6	1	7.60	
16	3	11	1	5	1	0.50	BURNT
871	2	16	1	1	1	6.70	
762	3	13	0	5	1	0.20	BURNT
762	3	13	0	6	1	0.10	
628	2	11	1	6	1	5.30	BURNT
630	2	32	0	6	1	8.70	
633	3	13	0	5	1	0.40	
633	4	16	1		1	0.10	
626	2	32	0	6	1	2.40	
625	4	13	0		1	0.00	
794	3	13	0	5	1	0.20	
794	3	11	1	5	1	0.20	
729	4	13	0		1	0.10	
729	4	13	0		1	0.00	BURNT
533	2	13	0	6	1	3.10	
733	2	13	0	6	1	2.00	
531	3	13	0	5	1	0.20	BURNT
531	3	23	0	5	1	0.10	
531	4	13	0		1	0.10	BURNT
531	4	31	0		1	0.00	
527	3	13	0	5	1	0.30	BURNT
529	3	13	0	6	1	0.30	
773	4	16	0		1	0.10	
601	4	11	0		1	0.10	
634	3	13	0	5	1	0.30	
634	4	11	0		1	0.10	
634	4	17	0		1	0.00	
634	4	16	0		1	0.00	
634	4	13	0		6	0.30	
634	4	13	0	7	1	0.00	
376	4	13	0		1	0.00	
350	3	13	0	6	1	0.10	
352	3	13	0	5	1	0.10	

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
352	3	12	1	5	1	0.10	
352	4	13	0		2	0.10	
352	4	17	0		1	0.10	
376	4	13	0		1	0.00	
273	3	13	0	6	1	0.10	
273	4	13	0		1	0.10	BURNT
275	4	11	0		1	0.10	
275	4	13	0		1	0.00	
209	1	13	1	6	1	11.20	
207	4	15	1		1	0.00	
207	4	13	0		2	0.10	
207	4	17	0		1	0.00	
207	4	26	0		1	0.00	
207	4	16	0		1	0.00	
202	3	16	0	6	1	0.50	
206	3	32	0	6	1	0.50	
206	4	11	0		1	0.00	
206	4	26	0		1	0.00	
268	4	16	0		1	0.10	
203	3	11	1	5	1	0.30	
209	3	26	0	5	1	0.20	
209	4	13	0		1	0.00	
209	4	26	0		1	0.00	
226	3	26	0	6	1	0.60	
226	3	32	1	5	1	0.30	BURNT
226	4	31	0		2	0.00	
226	4	13	0		1	0.10	
226	4	16	0		1	0.00	
296	3	13	0	6	1	0.40	BURNT
296	4	16	0		1	0.00	
296	4	13	0		1	0.10	
333	4	16	0		1	0.00	
333	4	32	0		1	0.00	
333	4	13	0		1	0.00	
223	3	11	0	6	1	0.50	
223	3	13	0	5	1	0.20	
225	3	13	0	5	1	0.80	
225	3	13	0	6	1	0.20	
225	3	16	1	1	1	1.60	BURNT
331	3	13	0	6	1	0.10	
331	4	13	0		2	0.20	

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FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
331	4	11	0		1	0.00	
267	3	17	0	5	1	0.30	
297	3	13	0	6	1	0.20	HEAT ALTERED
297	3	16	0	6	1	0.20	BURNT
297	3	13	0	6	1	0.10	
297	4	30	0		1	0.00	
297	4	12	0		1	0.20	
297	4	16	0		1	0.10	BURNT
297	4	13	0		1	0.10	BURNT
5	4	11	0		1	0.00	
5	4	13	0		1	0.10	BURNT
34	4	13	0		2	0.10	
7	3	13	0	6	1	0.40	
7	3	12	1	5	1	0.70	
7	4	16	0		1	0.10	
2	3	26	0	5	1	0.40	
3	4	16	0		1	0.00	BURNT
71	4	12	0		1	0.00	
94	3	16	0	6	1	0.10	
58	2	13	0	6	1	4.60	
58	3	15	0	6	1	0.20	
57	3	13	0	6	1	0.10	
57	4	11	0		1	0.10	
51	3	13	0	5	1	0.50	
51	3	13	0	6	1	0.20	BURNT
160	3	11	0	6	1	0.70	
160	3	47	0	5	1	0.80	MUDSTONE
160	4	13	0		1	0.20	
160	4	16	0		1	0.00	
79	3	11	0	5	1	0.20	
77	4	16	0		1	0.30	
92	4	16	0		1	0.00	
111	4	11	0		2	0.10	
90	4	11	0		1	0.10	
88	4	13	0		1	0.10	
88	4	11	0		1	0.10	
175	3	13	0	6	1	0.50	
175	4	13	0		1	0.10	
166	3	17	0	6	1	0.10	
165	3	11	1	5	1	0.20	

FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
235	3	11	0	6	1	1.00	
238	4	13	1		1	0.10	
421	3	16	1	5	1	0.30	BURNT
421	3	11	0	6	1	0.40	
864	4	13	0		1	0.10	
862	3	31	0	6	1	0.20	
862	3	13	0	6	1	0.10	
867	4	13	0		2	0.10	BURNT
867	4	11	0		1	0.00	
867	4	26	0		1	0.00	
818	3	22	0	5	1	0.50	
819	3	11	0	6	1	0.10	
869	4	13	0		1	0.00	
797	4	17	0		1	0.00	
797	4	13	1		1	0.10	BURNT
620	3	11	1	6	1	0.10	
620	3	11	0	6	1	0.30	
690	4	11	0		1	0.00	
753	2	31	0	6	1	6.10	
753	4	16	0		1	0.00	
753	4	13	0		2	0.20	BURNT
552	3	17	1	5	1	0.40	
548	4	13	0		1	0.10	
742	3	26	0	6	1	0.30	
742	3	11	0	7	1	0.10	
603	3	32	0	5	1	0.60	
603	3	16	0	1	1	0.50	BURNT
603	4	16	0		2	0.30	
603	4	11	0		1	0.10	
603	4	13	0		3	0.10	
740	4	11	0		1	0.00	
740	4	13	0		1	0.00	
735	2	13	0	6	1	2.80	
735	3	30	1	5	1	0.50	
439	4	13	0	7	1	0.10	
439	4	13	0		1	0.10	
430	4	16	0		1	0.00	
430	4	16	1		1	0.00	
430	4	13	0		1	0.00	
429	4	26	0		1	0.10	
419	3	13	0	6	1	0.60	BURNT

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FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
419	4	11	0		2	0.10	
433	4	44	0		1	0.10	OBSIDIAN
757	4	16	0		2	0.00	
757	4	13	0		1	0.00	
420	3	41	1	6	1	0.50	QUARTZ
420	3	13	0	6	1	0.20	
759	3	16	0	6	1	0.10	
759	4	16	1		2	0.10	
759	4	13	0		1	0.10	
437	2	12	1	6	1	3.70	
443	3	23	0	6	1	0.50	
443	4	13	0		2	0.20	
388	4	13	0		1	0.10	
386	3	11	0	6	1	0.50	
386	3	13	0	5	1	0.10	BURNT
309	3	12	0	6	1	0.40	
309	3	13	0	6	1	0.70	
313	4	13	0		1	0.00	
192	4	41	0		1	0.10	QUARTZ
192	4	13	0		1	0.00	
191	4	26	0		1	0.20	
191	4	31	1		1	0.00	
186	4	41	0		1	0.10	
186	4	11	0		1	0.10	
186	4	13	0		2	0.10	BURNT
133	2	17	1	6	1	3.40	
133	3	26	1	5	1	0.90	
133	3	26	0	5	1	0.40	
133	3	25	0	5	1	0.20	
133	3	13	0	6	1	0.20	
109	2	12	1	1	1	1.50	
109	3	11	0	6	1	0.20	
135	3	26	0	5	1	2.70	
107	3	13	0	1	1	0.10	
327	4	17	0		1	0.00	
318	4	16	0		2	2.20	BURNT
318	4	31	0		1	0.00	
318	4	13	0		1	0.00	
315	3	26	0	5	1	0.50	
315	4	41	0		1	0.10	QUARTZ
315	4	17	0		1	0.10	

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FS	Size grade	Material type	Cortex	Flake type	Count	Gram	Comment
102	3	12	0	6	1	0.10	
102	3	26	0	5	1	0.20	
102	4	13	0		1	0.00	
102	4	32	0		1	0.00	
131	4	12	0		1	0.00	
157	4	13	0		1	0.10	
157	4	11	0		1	0.00	
426	3	13	0	6	1	0.30	BURNT
428	3	13	0	6	1	0.10	HEAT ALTERED
849	2	13	1	5	1	4.60	
859	3	13	0	6	1	0.20	
859	4	13	0		1	0.00	
854	3	13	0	6	1	0.10	
853	3	13	0	6	1	0.10	BURNT
81	4	13	0		1	0.10	
81	4	17	0		1	0.00	
81	4	12	0		1	0.00	
633	4	13	0		1	0.10	
893	4	13	0		1	0.10	
893	4	16	0		1	0.10	
894	4	16	0		2	0.10	
895	3	13	0	7	1	0.10	
895	4	12	0		1	0.10	
895	4	13	0		3	0.10	
896	4	11	0		1	0.10	
896	4	13	0	7	1	0.10	
896	4	13	0		1	0.10	
897	3	12	0	6	1	0.20	
897	4	13	0	7	1	0.10	
897	4	13	0		7	0.20	
898	4	26	0		1	0.10	
408	2	32	0	5	1	1.60	
1	2	32	1	5	1	1.40	
335	4	31	0		1	0.10	
335	4	41	0		1	0.10	quartz
335	4	26	0		1	0.10	
335	4	13	0		1	0.10	

Appendix I Non-chipped stone coding format utilized for the WIC Piceance non-chipped stone tools and artifacts

GROUND STONE CLASS

MN	mano
NF	mano fragment
MT	metate
MF	metate fragment
UN	unknown/indeterminate
HS	hammer stone
OT	other

MATERIAL TYPE

1	chert
2	quartzite
3	siltstone
4	sandstone
5	other

COMPLETENESS

IC	incomplete
NC	nearly complete
CO	complete
RC	reconstructed

MANUFACTURING PROCESS

G	grinding
P	pecking
F	flaking
U	unmodified
Z	unknown

MANUFACTURING INTENSITY

0	unmodified
1	1-25% modified
2	26-50% modified
3	51-75% modified
4	76-100% modified
9	unknown

WEAR TYPE

G	grinding
P	polishing
S	striations
K	pecking
B	battered
U	unmodified
Z	unknown

WEAR DIRECTION

PL	parallel to long axis of tool
PR	perpendicular to long axis of tool
DR	diagonal right
IR	irregular
Z	unknown

USE WEAR INTENSITY

L	light
H	heavy

5MF6255 Non-chipped Stone Tools

FS	Material type	Complete	Length	Width	Thickness	Mass	Manufacture process	Manufacture intensity	Wear type 1	Wear type 2	Wear type 3	Wear direction 1	Wear direction 2	Wear direction 3	Wear intensity 1
18	4	ic	0	0	28	494	gpf	4	gk			pl			h
35	4	ic	0	0	30	209	gp	4	gks			pr			h
67	2	co	98	65	50	513	u	0	g	g	b	pr	pr	z	h
84	2	co	124	85	65	680	gp	2	gks	g	g	z	z	z	l
114	4	co	42	39	29	60	z	9							
115	4	nc	78	68	65	446	g	0	g			z			z
120	2	ic	0	0	0	54	g	2	gp			z			l
121	4	ic	0		26	211	gp	4	g			z			h
128	2	ic	0	0	0	189	gp	3	g	g		z	z		h
161	4	ic	0	0	14	46	g	3	g			z			h
176	4	nc	104	70	50	377	z	9	u			z			z
178	4	co	28	27	23	23	z	9							
185	4	ic	0	0	35	186	gp	4	gk	b	gk	pr	z	pr	h
195	2	ic	0	0	44	311	g	4	gs	gs	b	pr	pr	z	h
198	4	co	139	50	50	466	z	9							
230	4	rc	0	204	29	2412	fg	4	gskp	gskp		pl	pl		h
231	4	rc	0	80	53	451	gp	3	gk	gk		pr	pr		h
236	4	co	85	79	36	330	z	9							
237	4	ic	0	0	29	907	gp	4	gk			z			l
252	4	nc	40	31	20	32	z	9	p			z			l
260	2	ic	0	0	0	141	g	3	g			z			z
263	4	ic	0	0	29	400	gp	4	gks	gk		pr	pr		l

FS	Wear intensity 2	Wear intensity 3	Class	Burned	Reuse	Use phase	Reject	Pollen	Comments
18			mf	yes	no			no	dished
35			mf	yes	no			no	very slight striations
67	h	h	mn	yes	yes	3	1	yes	S#14
84	l	l	mn	yes	no			no	
114			ot	no	no			no	flattend ridge around perimeter, sling shot ammo? Or deteriorating ss manuport
115			un	no	no			no	very friable ss cobble that is deteriorating
120			nf	yes	no			no	
121			mf	yes	no			no	2 pieces refit
128	h		nf	yes	no			no	
161			mf	no	no			no	dished
176			un	no	no			no	very friable ss cobble that is deteriorating
178			ot	no	no	3	1	no	sling shot ammo?
185	l	h	nf	yes	no			no	
195	h	l	nf	yes	yes			no	
198			ot	no	no			no	deteriorating ss manuport
230	h		mt	yes	no	4	11	no	refits with FS 365, 496, 543, 562. Ochre stains on both sides
231	h		nf	yes	no			no	refits with fs280
236			ot	yes	no			no	deteriorating ss manuport
237			mf	no	no			no	slightly dished
252			ot	yes	no			no	smooth red rock
260			nf	yes	no			no	side piece - no working surface - only shaped
263	l		mf	yes	no			no	

5MF6255 Non-chipped Stone Tools

FS	Material type	Complete	Length	Width	Thickness	Mass	Manufacture process	Manufacture intensity	Wear type 1	Wear type 2	Wear type 3	Wear direction 1	Wear direction 2	Wear direction 3	Wear intensity 1
280	4	rc	0	0	0	0	gp								
283	4	ic	0	0	0	6	g	3	g			z			h
290	2	co	131	77	54	907	gp	4	gks	gks	b	pr	pr	z	h
299	4	co	33	27	16	19	z	9							
300	2	ic	0	0	0	958	fp	9	g	gp		z	z		h
314	2	co	129	72	55	701	gp	2	gkps	gkp		pr	pr		l
322	4	co	108	97	39	453	gp	1	gks	gks	b	dr	dr	z	h
323	4	ic	109	80	0	517	gp	4	g	g		z	z		h
343	2	ic	0	0	53	302	gp	4	gks	gk		z	z		l
360	2	co	118	85	48	601	gp	4	gks	gks		pr	pr		l
375	4	co	103	91	52	680	g	2	gspk	gk	gp	pr	z	z	l
399	4	co	106	75	49	456	gp	3	gks			pl			h
427	4	ic	0	0	0	20	z	9	gp			z			h
438	2	ic	0	0	0	11	gp	2	gs			z			l
446	4	ic	0	0	0	618	u	0	gks			z			l
448	4	ic	0	0	0	220	g	2	pg			z			l
457	4	nc	33	34	32	50	z	9	z			z			z
458	4	ic	0	0	17	75	gp	4	g			z			h
481	2	ic	0	0	0	7	z	9	gsp	g		z	z		h
487	4	ic	0	0	0	1058	f	2	gksp			z			h
490	4	ic	0	0	27	3039	fg	3	gksp	gks		pl	dl		h
509	4	ic	0	0	0	67	z	9	gp			z			l

FS	Wear intensity 2	Wear intensity 3	Class	Burned	Reuse	Use phase	Reject	Pollen	Comments
280			nf	yes	no			no	refits with fs231
283			un	no	no			no	
290	h	l	mn	no	yes			no	
299			ot	no	no			no	deteriorating ss, sling shot ammo? Narrow groove along midline in center
300	h		mf	yes	no			yes	S#13
314	l		mn	no	yes			no	
322	h	l	mn	yes	yes	4	10	yes	4bzl,S#10,reused as hammerstone; pollen wash sample not submitted
323	h		nf	yes	no			no	
343	l		mf	yes	no			no	double sided dished metate fragment
360	l		mn	yes	no			no	
375	l	l	mn	yes	yes			no	lightly battered on one edge, one ground facet on edge
399			mn	no	no	3	1	yes	S#11; pollen wash sample not submitted
427			nf	yes	no			no	
438			un	no	no			no	
446			mf	no	no	4	11	no	
448			nf	yes	no			no	edge grinding surface
457			ot	no	no			no	sling shot ammo?
458			mf	no	no			no	
481	l		mf	no	no			no	
487			mf	yes	no	4	11	yes	S# 12
490	h		mf	no	yes	4	11	yes	S#15, 2nd appears to have been reused after 1st; pollen wash sample not submitted
509			mf	yes	no			no	

5MF6255 Non-chipped Stone Tools

FS	Material type	Complete	Length	Width	Thickness	Mass	Manufacture process	Manufacture intensity	Wear type 1	Wear type 2	Wear type 3	Wear direction 1	Wear direction 2	Wear direction 3	Wear intensity 1
515	2	co	112	110	46	680	gp	3	gp	gk	gp	z	z	z	h
518	4	ic	0	0	0	161	gp	4	gsk	gk		z	z		h
519	2	ic	0	0	47	162	gp	2	gsp	gsp	b	pr	pr	z	h
542	2	ic	0	56	26	114	z	9	b	b		z	z		h
550	4	ic	0	0	0	16	g	0	gp			z			l
576	2	co	162	106	59	907	z	9	pk			z			l
577	4	co	28	26	22	24		0							
580	4	nc	377	256	39	5817	f	1	gk	gks		z	pl		h
581	4	ic	0	0	0	30	g	4	gsp			z			h
582	2	co	97	96	54	680	z	0	pk			z			l
583	4	ic	0	208	0	1371	fg	4	gksp	gks		pl	pl		h
611	4	ic	0	0	27	145	gp	4	gs	gks		pl	z		h
644	4	ic	0	0	0	110.4	z	9	g			z			l
663	4	ic	0	0	46	260	gp	4	gksp	gk	b	pr	pr	z	h
670	4	ic	0	0	59	480	gp	4	gs	gs		pr	z		l
679	2	ic	0	0	0	292	g	2	g			z			l
722	2	co	147	80	35	576		0							
727	2	ic	0	145	76	405	z	0							
756	2	co	119	68	50	557	g	2	gksp	gs	b	pl	dr	z	h
776	4	ic	0	0	0	1.4		0							
784	4	ic	0	0	46	191	gp	4	gsk	g		pr	pr		h
785	2	co	121	75	55	610	g	3	gs	b		pr	ir		l
789	4	ic	0	0	0	59	gp	4	gks			pr			h
825	2	ic	0	0	0	131	g	3	g			z			l
837	4	ic	80	64	28	218		0							

FS	Wear intensity 2	Wear intensity 3	Class	Burned	Reuse	Use phase	Reject	Pollen	Comments
515	h	h	mn	yes	no			no	triangluar in shape - battering/pecking on pts.
518	h		nf	yes	no			no	
519	h	h	nf	yes	no			no	
542	h		hs	no	yes			no	flaked tested cobble
550			un	no	no			no	
576			mt	no	no			no	
577			ot	no	no	3	1	no	sling shot ammo?
580	h		mt	no	no	3	1	yes	S # 16
581			nf	yes	no			no	
582			mn	yes	no			no	
583	h		mf	yes	no	4	8	yes	S#17
611	h		mf	yes	yes			no	both sides ground
644			mf	yes	no	2	8	no	
663	h	l	nf	yes	yes			no	end pounded/battered
670	l		nf	yes	no			no	bottom and side/edge ground
679			nf	yes	no			no	
722			ot	no	no	3	1	no	manuport, 1 flake removed
727			ot	no	no			no	manuport - no evidence of use or heating
756	h	h	mn	yes	yes	3	1	no	red ochre in facet 1
776			ot	no	no	2	8	no	unmodified, poss. Part of a metate
784	l		nf	no	no			no	
785	l		mn	yes	yes			no	battered at one end
789			un	yes	no			no	two pieces refit
825			nf	yes	no			no	
837			ot	no	no			no	manuport (sandstone fragment)

5MF6255 Non-chipped Stone Tools

FS	Material type	Complete	Length	Width	Thickness	Mass	Manufacture process	Manufacture intensity	Wear type 1	Wear type 2	Wear type 3	Wear direction 1	Wear direction 2	Wear direction 3	Wear intensity 1
850	2	ic	0	0		104	g	2	gp			z			l
878	4	ic	0	0	0	41.9	g	9	gps			z			l
885	4	nc	27	23	17	16	z	0	z			z			z
886	4	co	122	78	46	707	p	1	gsp	gspk	g	pl	pl	z	h
899	4	ic	0	0	0	49	z	9	g			z			l
900	4	co	18	18	17	7	z	0							
901	4	co	32	23	26	30	z	0							
902	4	co	45	32	20	35	z	0							
924	4	co	85	44	27	137.4		0							

FS	Wear intensity 2	Wear intensity 3	Class	Burned	Reuse	Use phase	Reject	Pollen	Comments
850			nf	yes	no			no	
878			nf	yes	no	2	8	no	
885			ot	no	no			no	sling shot ammo?
886	l	h	mn	yes	yes	3	1	no	4bzl
899			mf	no	no	2	8	no	
900			ot	no	no			no	sling shot ammo? Deteriorating ss manuport
901			ot	no	no			no	sling shot ammo? Deteriorating ss manuport
902			ot	no	no			no	sling shot ammo? Deteriorating ss manuport
924				no	no			no	

APPENDIX J

Artifact Catalog

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	1	1	flaking debris	147		199					2
2009.013	2	2	flaking debris	147		199					3
2009.013	3	3	flaking debris	147		199					4
2009.013	4	4	bone	147		199					4
2009.013	5	5	flaking debris	147		199					5
2009.013	6	6	bone	147		199					5
2009.013	7	7	flaking debris	147		199					6
2009.013	8	8	bone	147		199					6
2009.013	9	9	bone	146		199					2
2009.013	10	10	flaking debris	146		199					2
2009.013	11	11	bone	146		199					3
2009.013	12	12	flaking debris	146		199					3
2009.013	13	13	bone	146		199					4
2009.013	14	14	bone	146		199					5
2009.013	15	15	flaking debris	146		199					5
2009.013	16	16	flaking debris	146		199					6
2009.013	17	17	bone	146		199					6
2009.013	18	18	ground stone	146	0.45	199	0.74				6
2009.013	19	19	flaking debris	149		198					4
2009.013	20	20	bone	149		198					4
2009.013	21	21	flaking debris	145		199					2
2009.013	22	22	bone	145		199					3
2009.013	23	23	flaking debris	145		199					3
2009.013	24	24	bone	145		199					4
2009.013	25	25	flaking debris	145		199					4
2009.013	26	26	bone	145		199					5
2009.013	27	27	flaking debris	145		199					5
2009.013	28	28	bone	145	0.52	199	0.88				6
2009.013	29	29	bone	145		199					6

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
1	arbitrary	140	150			datum	1/4	GW/CEC	8/23/2006
2	arbitrary	150	160			datum	1/4	GW/CEC	8/23/2006
3	arbitrary	160	170			datum	1/4	GW/CEC	8/23/2006
4	arbitrary	160	170			datum	1/4	GW/CEC	8/23/2006
5	arbitrary	170	180			datum	1/4	GW/CEC	8/23/2006
6	arbitrary	170	180			datum	1/4	GW/CEC	8/23/2006
7	arbitrary	180	190			datum	1/4	GW/CEC	8/24/2006
8	arbitrary	180	190			datum	1/4	GW/CEC	8/24/2006
9	arbitrary	140	150			datum	1/4	CEC/GW	8/23/2006
10	arbitrary	140	150			datum	1/4	CEC/GW	8/23/2006
11	arbitrary	150	160			datum	1/4	CEC/GW	8/23/2006
12	arbitrary	150	160			datum	1/4	CEC/GW	8/23/2006
13	arbitrary	160	170			datum	1/4	CEC/GW	8/23/2006
14	arbitrary	170	180			datum	1/4	CEC/GW	8/23/2006
15	arbitrary	170	180			datum	1/4	CEC/GW	8/23/2006
16	arbitrary	180	190			datum	1/4	CEC/GW	8/24/2006
17	arbitrary	180	190			datum	1/4	CEC/GW	8/24/2006
18	arbitrary	180	190	185		datum	1/4	CEC/GW	8/24/2006
19	arbitrary	180	190			datum	1/4	NIO/JW	8/24/2006
20	arbitrary	180	190			datum	1/4	NIO/JW	8/24/2006
21	arbitrary	140	150			datum	1/4	MAC/EMM	8/23/2006
22	arbitrary	150	160			datum	1/4	MAC/EMM	8/23/2006
23	arbitrary	150	160			datum	1/4	MAC/EMM	8/23/2006
24	arbitrary	160	170			datum	1/4	MAC/EMM	8/23/2006
25	arbitrary	160	170			datum	1/4	MAC/EMM	8/23/2006
26	arbitrary	170	180			datum	1/4	MAC/EMM	8/23/2006
27	arbitrary	170	180			datum	1/4	MAC/EMM	8/23/2006
28	arbitrary	180	190	183		datum	1/4	MAC/EMM	8/23/2006
29	arbitrary	180	190			datum	1/4	MAC/EMM	8/23/2006

Cat	Provenience Comments
1	one bucket screened through 1/8" mesh; half unit on east side of pipeline trench
2	heavily disturbed by rodents; one bucket screened through 1/8" mesh; charcoal flecking present; half unit on east side of pipeline trench
3	one bucket soil screened through 1/8" mesh; moderate disturbance by rodents; half unit on east side of pipeline trench
4	one bucket soil screened through 1/8" mesh; moderate disturbance by rodents; half unit on east side of pipeline trench
5	mottling slightly increasing; moderate rodent disturbance; one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
6	mottling slightly increasing; moderate rodent disturbance; one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
7	less mottling than previous level; moderate charcoal flecking present; minimal rodent disturbance; one bucket screened through 1/8" mesh; half unit on east side of pipeline trench
8	less mottling than previous level; moderate charcoal flecking present; minimal rodent disturbance; one bucket screened through 1/8" mesh; half unit on east side of pipeline trench
9	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
10	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
11	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
12	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
13	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
14	one bucket screened through 1/8" mesh; half unit on east side of pipeline trench
15	one bucket screened through 1/8" mesh; half unit on east side of pipeline trench
16	one bucket soil screened through 1/8" mesh; F17 is small house, level is about 20 cm above base noted in profile of trench; half unit on east side of pipeline trench
17	one bucket soil screened through 1/8" mesh; F17 is small house, level is about 20 cm above base noted in profile of trench; half unit on east side of pipeline trench
18	one bucket soil screened through 1/8" mesh; F17 is small house, level is about 20 cm above base noted in profile of trench; half unit on east side of pipeline trench
19	one bucket soil screened through 1/8" mesh; base of excavation complete removal of dark soil in flat level; half unit on west side of pipeline trench
20	one bucket soil screened through 1/8" mesh; base of excavation complete removal of dark soil in flat level; half unit on west side of pipeline trench
21	half unit on east site of pipeline trench; one bucket screened through 1/8" mesh
22	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
23	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
24	minimal rodent disturbance; one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
25	minimal rodent disturbance; one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
26	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
27	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
28	one bucket soil screened through 1/8" mesh; near bottom of F17, a small house; minimal rodent disturbance; half unit on east side of pipeline trench
29	one bucket soil screened through 1/8" mesh; near bottom of F17, a small house; minimal rodent disturbance; half unit on east side of pipeline trench

Cat	Artifact Comments
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	round rock
18	
19	
20	
21	
22	
23	
24	
25	center of cluster
26	
27	
28	
29	

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	30	30	flaking debris	145		199					6
2009.013	31	31	bone	144		199					1
2009.013	32	32	flaking debris	144		199					2
2009.013	33	33	bone	147		199					7
2009.013	34	34	flaking debris	147		199					7
2009.013	35	35	ground stone	147	0.4	199	0.77				7
2009.013	36	36	flaking debris	143		199					4
2009.013	37	37	flaking debris	143		199					5
2009.013	38	38	bone	144		199					3
2009.013	39	39	flaking debris	144		199					3
2009.013	40	40	bone	144		199					4
2009.013	41	41	flaking debris	144		199					5
2009.013	42	42	bone	144		199					5
2009.013	43	43	flaking debris	149		199					3
2009.013	44	44	bone	149		199					4
2009.013	45	45	bone	149		199					5
2009.013	46	46	flaking debris	149		199					5
2009.013	47	47	bone	149		199					6
2009.013	48	48	projectile point	149	0.16	199	0.68				6
2009.013	49	49	bone	149		199					7
2009.013	50	50	flake tool	147		198					3
2009.013	51	51	flaking debris	147		198					3
2009.013	52	52	bone	146		199					7
2009.013	53	53	flaking debris	146		199					7
2009.013	54	54	bone					4	west		
2009.013	55	55	bone	145		198					3
2009.013	56	56	bone	147		198					4

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
30	arbitrary	180	190			datum	1/4	MAC/EMM	8/23/2006
31	arbitrary	132	140			datum	1/4	EMM	8/24/2006
32	arbitrary	140	150			datum	1/4	EMM	8/24/2006
33	arbitrary	190	200			datum	1/4	GW/CEC	8/24/2006
34	arbitrary	190	200			datum	1/4	GW/CEC	8/24/2006
35	arbitrary	190	200	194		datum	1/4	GW/CEC	8/24/2006
36	arbitrary	160	170			datum	1/4	MAC	8/24/2006
37	arbitrary	170	180			datum	1/4	MAC	8/25/2006
38	arbitrary	150	160			datum	1/4	EMM	8/25/2006
39	arbitrary	150	160			datum	1/4	EMM	8/25/2006
40	arbitrary	160	170			datum	1/4	EMM	8/25/2006
41	arbitrary	170	180			datum	1/4	EMM	8/25/2006
42	arbitrary	170	180			datum	1/4	EMM	8/25/2006
43	arbitrary	150	160			datum	1/4	NIO/JW	8/25/2006
44	arbitrary	160	170			datum	1/4	NIO/JW	8/25/2006
45	arbitrary	170	180			datum	1/4	NIO/JW	8/25/2006
46	arbitrary	170	180			datum	1/4	NIO/JW	8/25/2006
47	arbitrary	180	190			datum	1/4	NIO/JW	8/25/2006
48	arbitrary	180	190	185		datum	1/4	NIO/JW	8/25/2006
49	arbitrary	190	200			datum	1/4	NIO/JW	8/25/2006
50	arbitrary	160	170			datum	1/4	NIO/JW	8/25/2006
51	arbitrary	160	170			datum	1/4	NIO/JW	8/25/2006
52	arbitrary	190	200			datum	1/8	CEC/GW	8/25/2006
53	arbitrary	190	200			datum	1/8	CEC/GW	8/25/2006
54	natural	190	214			datum	1/8	GW/CEC	8/25/2006
55	arbitrary	160	170			datum	1/8		
56	arbitrary	170	180			datum	1/4	NIO/JW	8/26/2006

Cat	Provenience Comments
30	one bucket soil screened through 1/8" mesh; near bottom of F17, a small house; minimal rodent disturbance; half unit on east side of pipeline trench
31	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
32	half unit on east side of pipeline trench; one bucket soil screened through 1/8" mesh
33	uncovered top of F1, small basin poss post hole, F2, large shallow pit, and F5, edge of deep pit; floor of F17, small house; 1 bucket screened thru 1/8" mesh; 1/2 unit on E side of trench
34	uncovered top of F1, small basin poss post hole, F2, large shallow pit, and F5, edge of deep pit; floor of F17, small house; 1 bucket screened thru 1/8" mesh; 1/2 unit on E side of trench
35	uncovered top of F1, small basin poss post hole, F2, large shallow pit, and F5, edge of deep pit; floor of F17, small house; 1 bucket screened thru 1/8" mesh; 1/2 unit on E side of trench
36	half unit east of pipeline trench; dark brown/black mottling along north edge of unit
37	soil becomes darker to the south of unit; half unit east of pipeline trench; abundant rodent disturbance
38	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
39	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
40	one bucket soil screened through 1/8" mesh; yellow brown sand is significantly less compact than upper levels
41	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; base of excavation is complete removal of dark soil to underlying yellow brown sand in flat level
42	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; base of excavation is complete removal of dark soil to underlying yellow brown sand in flat level
43	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; minimal rodent disturbance
44	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
45	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
46	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
47	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; charcoal flecking present
48	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; charcoal flecking present
49	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; base of excavation is complete removal of dark soil in flat level
50	transitional level between upper overburden layer and cultural layer; one bucket soil screened through 1/8" mesh; minimal rodent disturbance; half unit on west side of pipeline trench
51	transitional level between upper overburden layer and cultural layer; one bucket soil screened through 1/8" mesh; minimal rodent disturbance; half unit on west side of pipeline trench
52	base of house (F17); F3 (E1/2 of circular pit) and F4 (W1/2 of circular pit) located in yellow brown mottled soil; half unit on east side of pipeline trench
53	base of house (F17); F3 (E1/2 of circular pit) and F4 (W1/2 of circular pit) located in yellow brown mottled soil; half unit on east side of pipeline trench
54	large, deep basin; interior feature of F17, small house; 10L of fill collected for flotation
55	
56	one bucket soil screened through 1/8" mesh; half unit on west side of pipeline trench

Cat	Artifact Comments
30	
31	point plot 1; refits w/cat.# 291 and 534
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	point plot 1
42	point plot 2
43	point plot 3
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	point plot 1
56	point plot 2

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	57	57	flaking debris	147		198					4
2009.013	58	58	flaking debris	147		198					5
2009.013	59	59	flake tool	147		198					5
2009.013	60	60	bone	147		198					5
2009.013	61	61	bone	147	0.88	198	0.28				5
2009.013	62	63	bone	147	0.25	198	0.36				5
2009.013	63	64	bone	145		198					4
2009.013	64	65	flaking debris	143		198					5
2009.013	65	66	bone	143		198					6
2009.013	66	67	ground stone		147.38		199.97	2	west		
2009.013	67	68	bone	146		199					8
2009.013	68	69	bone	146		199					
2009.013	69	70	bone	147		199					8
2009.013	70	71	flaking debris	147		199					8
2009.013	71	72	bone	144		198					1
2009.013	72	73	flaking debris	144		198					2
2009.013	73	74	bone	144		198					3
2009.013	74	75	bone	144		198					4
2009.013	75	76	bone	144		198					5
2009.013	76	77	flaking debris	148		199					3
2009.013	77	78	bone	148		199					4
2009.013	78	79	flaking debris	148		199					5
2009.013	79	80	bone	148		199					5
2009.013	80	81	flaking debris	148		199					6
2009.013	81	82	bone	148		199					6
2009.013	82	83	bone	148	0.02	199	0.59				6
2009.013	83	84	ground stone	148	0.35	199	0.61				7
2009.013	84	85	bone	148		199					3

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
57	arbitrary	170	180			datum	1/4	NIO/JW	8/26/2006
58	arbitrary	180	190			datum	1/8	NIO/JW	8/26/2006
59	arbitrary	180	190			datum	1/8	NIO/JW	8/26/2006
60	arbitrary	180	190			datum	1/8	NIO/JW	8/26/2006
61	arbitrary	180	190	186		datum	1/8	NIO/JW	8/26/2006
62	arbitrary	180	190	185		datum	1/8	NIO/JW	8/26/2006
63	arbitrary	170	180			datum	1/4	EMM/MAC	8/26/2006
64	arbitrary	180	190			datum	1/4	MAC	8/26/2006
65	arbitrary	190	200			datum	1/8	MAC	8/26/2006
66	natural	200	207	196		datum	1/8	GW/CEC	9/20/2006
67	arbitrary	200	210			datum	1/4	CEC/GW	8/26/2006
68	arbitrary	133	210			datum	1/8	SS	8/26/2006
69	arbitrary	200	210			datum	1/4	GW/CEC	8/26/2006
70	arbitrary	200	210			datum	1/4	GW/CEC	8/26/2006
71	arbitrary	141	150			datum	1/8	MAC	8/26/2006
72	arbitrary	150	160			datum	1/4	MAC	8/26/2006
73	arbitrary	160	170			datum	1/4	MAC/NIO	8/26/2006
74	arbitrary	170	180			datum	1/4	MAC	8/27/2006
75	arbitrary	180	190			datum	1/4	MAC	8/27/2006
76	arbitrary	150	160			datum	1/4	CEC/GW	8/27/2006
77	arbitrary	160	170			datum	1/4	CEC/GW	8/27/2006
78	arbitrary	170	180			datum	1/4	CEC/GW	8/27/2006
79	arbitrary	170	180			datum	1/4	CEC/GW	8/27/2006
80	arbitrary	180	190			datum	1/8	CEC/GW	8/27/2006
81	arbitrary	180	190			datum	1/8	CEC/GW	8/27/2006
82	arbitrary	180	190	184		datum	1/8	CEC/GW	8/27/2006
83	arbitrary	190	200	194		datum	1/8	CEC/GW	8/27/2006
84	arbitrary	150	160			datum	1/4	CEC/GW	8/27/2006

Cat	Provenience Comments
57	one bucket soil screened through 1/8" mesh; half unit on west side of pipeline trench
58	extreme west edge of F17, small house; half unit on west side of pipeline trench
59	extreme west edge of F17, small house; half unit on west side of pipeline trench
60	extreme west edge of F17, small house; half unit on west side of pipeline trench
61	extreme west edge of F17, small house; half unit on west side of pipeline trench
62	extreme west edge of F17, small house; half unit on west side of pipeline trench
63	half unit on west side of pipeline trench; dark soil screened through 1/8" mesh, lighter soil screened through 1/4" mesh; base of excavation complete removal of dark soil in flat level
64	cultural fill encountered in this level; some rodent disturbance; half unit west of pipeline trench; one bucket soil screened through 1/8" mesh
65	half unit west of pipeline trench; base of excavation was flat level used to define profile of potential features
66	all fill collected; charcoal date returned 7190 +/- 50 BP; large, shallow basin; interior basin of F17, small house
67	F3 (circular pit) and F4 (circular pit) excavated; base of excavation was complete removal of dark soil to underlying yellow brown sand in flat level; half unit on east side of pipeline trench
68	wall cleanup for profile
69	F1, 2 removed in level; F5 remains along east trench wall; base of excavation is complete removal of dark soil in flat level; one bucket soil screened through 1/8" mesh
70	F1, 2 removed in level; F5 remains along east trench wall; base of excavation is complete removal of dark soil in flat level; one bucket soil screened through 1/8" mesh
71	upper portion of the level not screened, overburden; half unit on west side of pipeline trench
72	minimal rodent disturbance; some charcoal flecking present; half unit on west side of pipeline trench
73	charcoal flecking present; half unit on west side of pipeline trench; one bucket soil screened through 1/8" mesh
74	minimal rodent disturbance; charcoal flecking present; mostly out of darker soil except in south portion; one bucket soil screened through 1/8" mesh; half unit west side pipeline trench
75	base of excavation is completely out of dark soil in flat level; minimal rodent disturbance; half unit on west side of pipeline trench
76	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench
77	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; charcoal flecking present
78	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; minimal rodent disturbance
79	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench; minimal rodent disturbance
80	half unit on east side of pipeline trench; F17 is small house, north edge; heavy disturbance by rodents
81	half unit on east side of pipeline trench; F17 is small house, north edge; heavy disturbance by rodents
82	half unit on east side of pipeline trench; F17 is small house, north edge; heavy disturbance by rodents
83	base of excavation is complete removal of dark soil in flat level; half unit on east side of pipeline trench; F1 is small oval pit, poss post hole; floor of F17, small house
84	one bucket soil screened through 1/8" mesh; half unit on east side of pipeline trench

Cat	Artifact Comments
57	
58	
59	
60	point plot 1
61	point plot 2
62	point plot 3
63	
64	
65	floor scraping
66	
67	
68	
69	point plot 1
70	point plot 2
71	
72	point plot 1
73	
74	
75	
76	
77	
78	
79	
80	wall scraping for profile
81	
82	
83	
84	

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	85	86	bone					7			
2009.013	86	87	bone	148		198					2
2009.013	87	88	flaking debris	148		198					3
2009.013	88	89	bone	148		198					4
2009.013	89	90	flaking debris	148		198					4
2009.013	90	91	bone	148		199					7
2009.013	91	92	flaking debris	148		199					7
2009.013	92	93	bone	147		199					
2009.013	93	94	flaking debris	147		199					
2009.013	94	95	flaking debris	143		200					3
2009.013	95	96	bone	143		200					3
2009.013	96	97	flaking debris	143		200					4
2009.013	97	98	bone	143		200					5
2009.013	98	99	flaking debris	143		200					5
2009.013	99	100	bone	143		200					6
2009.013	100	101	bone	145		199					7
2009.013	101	102	flaking debris	146		198					4
2009.013	102	103	bone	146		198					4
2009.013	103	104	flake tool	146	0.78	198	0.2				4
2009.013	104	105	bone	146		198					5
2009.013	105	106	bone	146		200					2
2009.013	106	107	flaking debris	146		200					2
2009.013	107	108	bone	146		200					3
2009.013	108	109	flaking debris	146		200					3
2009.013	109	110	bone	148		198					5
2009.013	110	111	flaking debris	148		198					5
2009.013	111	112	bone	148		198					6
2009.013	112	113	bone	149		200					2

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
85	natural	199	213			datum	1/8	NIO/JW	8/27/2006
86	arbitrary	150	160			datum	1/4	NIO/JW	8/27/2006
87	arbitrary	160	170			datum	1/4	NIO/JW	8/27/2006
88	arbitrary	170	181			datum	1/4	NIO	8/27/2006
89	arbitrary	170	181			datum	1/4	NIO	8/27/2006
90	arbitrary	190	200			datum	1/8	CEC/GW	8/27/2006
91	arbitrary	190	200			datum	1/8	CEC/GW	8/27/2006
92	arbitrary	130	210			datum	1/8	SS	8/27/2006
93	arbitrary	130	210			datum	1/8	SS	8/27/2006
94	arbitrary	150	160			datum	1/4	SS/GW	8/28/2006
95	arbitrary	150	160			datum	1/4	SS/GW	8/28/2006
96	arbitrary	160	170			datum	1/4	GW/CEC	8/28/2006
97	arbitrary	170	180			datum	1/4	GW/CEC	8/28/2006
98	arbitrary	170	180			datum	1/4	GW/CEC	8/28/2006
99	natural	180	184			datum	1/8	GW/CEC	8/28/2006
100	arbitrary	190	198			datum	1/4	MAC/EMM	8/24/2006
101	arbitrary	170	180			datum	1/8	MAC	8/27/2006
102	arbitrary	170	180			datum	1/8	MAC	8/27/2006
103	arbitrary	170	180	178		datum	1/8	MAC	8/27/2006
104	arbitrary	180	190			datum	1/8	MAC	8/27/2006
105	arbitrary	130	140			datum	1/4	NIO/JW	8/28/2006
106	arbitrary	130	140			datum	1/4	NIO/JW	8/28/2006
107	arbitrary	140	150			datum	1/4	NIO/JW	8/28/2006
108	arbitrary	140	150			datum	1/4	NIO/JW	8/28/2006
109	arbitrary	181	190			datum	1/4	NIO/JW	8/27/2006
110	arbitrary	181	190			datum	1/4	NIO/JW	8/27/2006
111	arbitrary	190	200			datum	1/4	NIO/JW	8/28/2006
112	arbitrary	130	140			datum	1/4	EMM	8/27/2006

Cat	Provenience Comments
85	small circular basin feature; fill collected; interior feature of F17, small house; poss post hole, located near northwest "wall" of house
86	half unit on west side of pipeline trench
87	one bucket soil screened through 1/8" mesh; half unit on west side of pipeline trench
88	one bucket soil screened through 1/8" mesh; half unit on west side of pipeline trench
89	one bucket soil screened through 1/8" mesh; half unit on west side of pipeline trench
90	base of excavation is complete removal of dark soil in flat level; half unit on east side of pipeline trench; F1 is small oval pit, poss post hole; floor of F17, small house
91	base of excavation is complete removal of dark soil in flat level; half unit on east side of pipeline trench; F1 is small oval pit, poss post hole; floor of F17, small house
92	wall cleanup for profile
93	wall cleanup for profile
94	soil transitions to dark brown/black sand as it slopes to the southeast; one bucket soil screened through 1/8" mesh
95	soil transitions to dark brown/black sand as it slopes to the southeast; one bucket soil screened through 1/8" mesh
96	underlying yellow brown sand along north edge and in southeast corner; heavy rodent disturbance; one bucket soil screened through 1/8" mesh
97	heavily disturbed by rodents; yellow brown sand throughout most of unit; one bucket soil screened through 1/8" mesh
98	heavily disturbed by rodents; yellow brown sand throughout most of unit; one bucket soil screened through 1/8" mesh
99	base of excavation removed dark brown/black soil to underlying yellow brown sand; heavily disturbed by rodents
100	base of excavation is complete removal of dark soil; minimal rodent disturbance; half unit on east side of pipeline trench; one bucket soil screened through 1/8" mesh
101	charcoal flecking present; half unit on west side of pipeline trench
102	charcoal flecking present; half unit on west side of pipeline trench
103	charcoal flecking present; half unit on west side of pipeline trench
104	rodent disturbance throughout; charcoal flecking present; F17 is small house; half unit on west side of pipeline trench
105	
106	
107	one bucket soil screened through 1/8" mesh
108	one bucket soil screened through 1/8" mesh
109	one bucket soil screened through 1/8" mesh; half unit on west side of pipeline trench; base of dark sand reached in most of unit, into yellow brown silty sand, exc to flat level
110	one bucket soil screened through 1/8" mesh; half unit on west side of pipeline trench; base of dark sand reached in most of unit, into yellow brown silty sand, exc to flat level
111	base of level is complete removal of dark soil in flat level; moderate rodent disturbance; one bucket dark soil screened through 1/8" mesh; half unit west of pipeline trench
112	soil was screened after recovery of large, round, suspicious rock; unknown if it is cultural or natural

Cat	Artifact Comments
85	from NE edge of unit 197E
86	
87	poss. sling shot
88	
89	
90	
91	
92	
93	
94	
95	point plot 1
96	
97	
98	
99	
100	
101	
102	
103	
104	
105	point plot 1
106	point plot 1
107	
108	
109	point plot 1
110	
111	
112	

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	113	114	other artifact	149		200					2
2009.013	114	115	ground stone	149	0.66	200	0.65				2
2009.013	115	116	bone	149		200					3
2009.013	116	117	flaking debris	149		200					3
2009.013	117	118	bone	149		200					5
2009.013	118	119	flaking debris	149		200					5
2009.013	119	120	ground stone	143	0.61	200	0.33				5
2009.013	120	121	ground stone	143	0.7	200	0.35				5
2009.013	121	122	flaking debris	143		197					5
2009.013	122	123	bone	145		200					1
2009.013	123	124	bone	145		200					2
2009.013	124	125	bone	145		200					3
2009.013	125	126	flaking debris	145		200					3
2009.013	126	127	flake tool	145	0.81	200	0.48				3
2009.013	127	128	ground stone	145	0.08	200	0.27				3
2009.013	128	129	bone	146		197					3
2009.013	129	130	bone	146		197					4
2009.013	130	131	flaking debris	146		197					4
2009.013	131	132	bone	146		200					4
2009.013	132	133	flaking debris	146		200					4
2009.013	133	134	bone	146		200					5
2009.013	134	135	flaking debris	146		200					5
2009.013	135	136	bone	146	0.31	200	0.85				5
2009.013	136	137	bone	146	0.44	200	0.67				5
2009.013	137	138	bone	146	0.53	200	0.37				5
2009.013	138	139	bone	149		200					6
2009.013	139	140	flaking debris	149		200					6
2009.013	140	141	bone	144		197					3
2009.013	141	142	flaking debris	144		197					3
2009.013	142	143	bone	145		197					3
2009.013	143	144	flaking debris	145		197					3
2009.013	144	145	bone	145		197					4
2009.013	145	146	flaking debris	145		197					4
2009.013	146	147	bone	145		200					4

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
113	arbitrary	130	140			datum	1/4	EMM	8/27/2006
114	arbitrary	130	140	138		datum	1/4	EMM	8/27/2006
115	arbitrary	140	150			datum	1/4	EMM	8/27/2006
116	arbitrary	140	150			datum	1/4	EMM	8/27/2006
117	arbitrary	160	170			datum	1/4	MAC	8/27/2006
118	arbitrary	160	170			datum	1/4	MAC	8/27/2006
119	arbitrary	170	180	176		datum	1/4	GW/CEC	8/28/2006
120	arbitrary	170	180	177		datum	1/4	GW/CEC	8/28/2006
121	arbitrary	180	190			datum	1/4	CEC/GW	8/29/2006
122	arbitrary	126	130			datum	1/4	NIO/JW	8/24/2006
123	arbitrary	130	140			datum	1/4	NIO/JW	8/29/2006
124	arbitrary	140	150			datum	1/4	NIO/JW	8/29/2006
125	arbitrary	140	150			datum	1/4	NIO/JW	8/29/2006
126	arbitrary	140	150	144		datum	1/4	NIO/JW	8/29/2006
127	arbitrary	140	150	15		datum	1/4	NIO/JW	8/29/2006
128	arbitrary	160	170			datum	1/8	EMM/MAC	8/29/2006
129	arbitrary	170	180			datum	1/8	EMM/MAC	8/29/2006
130	arbitrary	170	180			datum	1/8	EMM/MAC	8/29/2006
131	arbitrary	150	160			datum	1/4	NIO/JW	8/28/2006
132	arbitrary	150	160			datum	1/4	NIO/JW	8/28/2006
133	arbitrary	160	170			datum	1/4	NIO/JW	8/29/2006
134	arbitrary	160	170			datum	1/4	NIO/JW	8/29/2006
135	arbitrary	160	170	162		datum	1/4	NIO/JW	8/29/2006
136	arbitrary	160	170	167		datum	1/4	NIO/JW	8/29/2006
137	arbitrary	160	170	169		datum	1/4	NIO/JW	8/29/2006
138	natural	170	180			datum	1/8	MAC	8/28/2006
139	natural	170	180			datum	1/8	MAC	8/28/2006
140	arbitrary	160	170			datum	1/4	CEC/GW	8/29/2006
141	arbitrary	160	170			datum	1/4	CEC/GW	8/29/2006
142	arbitrary	160	170			datum	1/4	CEC/NIO	9/6/2006
143	arbitrary	160	170			datum	1/4	CEC/NIO	9/6/2006
144	natural	170	180			datum	1/8	CEC/NIO	9/6/2006
145	natural	170	180			datum	1/8	CEC/NIO	9/6/2006
146	arbitrary	150	160			datum	1/8	NIO/JW	8/29/2006

Cat	Provenience Comments
113	soil was screened after recovery of large, round, suspicious rock; unknown if it is cultural or natural
114	soil was screened after recovery of large, round, suspicious rock; unknown if it is cultural or natural
115	one bucket soil screened through 1/8" mesh
116	one bucket soil screened through 1/8" mesh
117	one bucket soil screened through 1/8" mesh
118	one bucket soil screened through 1/8" mesh
119	heavily disturbed by rodents; yellow brown sand throughout most of unit; one bucket soil screened through 1/8" mesh
120	heavily disturbed by rodents; yellow brown sand throughout most of unit; one bucket soil screened through 1/8" mesh
121	dark soil still present through central portion of unit; one bucket soil screened through 1/8" mesh
122	
123	one bucket soil screened through 1/8" mesh; some charcoal flecking
124	one bucket soil screened through 1/8" mesh; moderate rodent activity in south portion
125	one bucket soil screened through 1/8" mesh; moderate rodent activity in south portion
126	one bucket soil screened through 1/8" mesh; moderate rodent activity in south portion
127	one bucket soil screened through 1/8" mesh; moderate rodent activity in south portion
128	transitions to mottled yellow brown silty sand
129	charocal flecking present; southern edge is hard yellow brown silty sand
130	charocal flecking present; southern edge is hard yellow brown silty sand
131	one bucket screened through 1/8" mesh; minimal rodent disturbance
132	one bucket screened through 1/8" mesh; minimal rodent disturbance
133	minimal rodent disturbance; charcoal flecking is present; one bucket soil screened through 1/8" mesh
134	minimal rodent disturbance; charcoal flecking is present; one bucket soil screened through 1/8" mesh
135	minimal rodent disturbance; charcoal flecking is present; one bucket soil screened through 1/8" mesh
136	minimal rodent disturbance; charcoal flecking is present; one bucket soil screened through 1/8" mesh
137	minimal rodent disturbance; charcoal flecking is present; one bucket soil screened through 1/8" mesh
138	base of excavation complete removal of dark soil to underlying yellow brown silty sand
139	base of excavation complete removal of dark soil to underlying yellow brown silty sand
140	one bucket soil screened through 1/8" mesh; moderate rodent disturbance throughout
141	one bucket soil screened through 1/8" mesh; moderate rodent disturbance throughout
142	one bucket soil screened through 1/8" mesh
143	one bucket soil screened through 1/8" mesh
144	base of excavation is complete removal of dark soil to underlying yellow brown silty sand
145	base of excavation is complete removal of dark soil to underlying yellow brown silty sand
146	yellow brown sand concentrated in the southeastern portion of unit

Cat	Artifact Comments
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137	point plot 1
138	
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140	
141	
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144	
145	in 5 pieces, lowest AU=3
146	

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	147	148	flaking debris	145		200					4
2009.013	148	149	flake tool	145	0.75	200	0.82				4
2009.013	149	150	bone	145	0.48	200	0.46				4
2009.013	150	151	bone	145		200					5
2009.013	151	152	flaking debris	145		200					5
2009.013	152	153	bone	145	0.48	200	0.24				5
2009.013	153	154	bone	145	0.9	200	0.83				5
2009.013	154	155	bone	145	0.58	200	0.75				5
2009.013	155	156	bone	146		197					5
2009.013	156	157	flaking debris	146		197					5
2009.013	157	158	bone	146		200					5
2009.013	158	159	bone	147		197					4
2009.013	159	160	flaking debris	147		197					4
2009.013	160	161	ground stone	147	0.77	197	0.17				4
2009.013	161	162	bone	147	0.14	197	0.54				4
2009.013	162	163	bone	147		197					5
2009.013	163	164	flake tool	147	0.91	197	0.05				5
2009.013	164	165	flaking debris	148		197					3
2009.013	165	166	flaking debris	148		197					4
2009.013	166	167	bone	148		200					2
2009.013	167	168	flaking debris	148		200					2
2009.013	168	169	bone	148		200					3
2009.013	169	170	flaking debris	148		200					3
2009.013	170	171	bone	145		200					
2009.013	171	172	bone	144		200					3
2009.013	172	173	flake tool	144		200					3
2009.013	173	174	bone	148		197					5
2009.013	174	175	flaking debris	148		197					5
2009.013	175	176	ground stone	148	0.88	197					5
2009.013	176	177	bone	149		197					4
2009.013	177	178	manuport	148		201					2

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
147	arbitrary	150	160			datum	1/8	NIO/JW	8/29/2006
148	arbitrary	150	160	159		datum	1/8	NIO/JW	8/29/2006
149	arbitrary	150	160	158		datum	1/8	NIO/JW	8/29/2006
150	arbitrary	160	171			datum	1/8	NIO/JW	8/29/2006
151	arbitrary	160	171			datum	1/8	NIO/JW	8/29/2006
152	arbitrary	160	171	170		datum	1/8	NIO/JW	8/29/2006
153	arbitrary	160	171	166		datum	1/8	NIO/JW	8/29/2006
154	arbitrary	160	171	170		datum	1/8	NIO/JW	8/29/2006
155	natural	180	190			datum	1/8	EMM/MAC	8/28/2006
156	natural	180	190			datum	1/8	EMM/MAC	8/28/2006
157	arbitrary	160	170			datum	1/4	NIO/JW	8/29/2006
158	arbitrary	170	180			datum	1/4	EMM/MAC	8/29/2006
159	arbitrary	170	180			datum	1/4	EMM/MAC	8/29/2006
160	arbitrary	170	180	180		datum	1/4	EMM/MAC	8/29/2006
161	arbitrary	170	180	180		datum	1/4	EMM/MAC	8/29/2006
162	natural	180	191			datum	1/4	EMM/CRP	9/6/2006
163	natural	180	191	182		datum	1/4	EMM/CRP	9/6/2006
164	arbitrary	160	170			datum	1/4	EMM/CRP	9/6/2006
165	arbitrary	170	180			datum	1/4	EMM/CRP	9/6/2006
166	arbitrary	140	150			datum	1/4	GW/CEC	8/30/2006
167	arbitrary	140	150			datum	1/4	GW/CEC	8/30/2006
168	arbitrary	150	160			datum	1/4	GW/CEC	8/30/2006
169	arbitrary	150	160			datum	1/4	GW/CEC	8/30/2006
170	arbitrary	125	164			datum	1/8	CEC	9/7/2006
171	arbitrary	150	161			datum	1/4	MAC/GW	9/7/2006
172	arbitrary	150	161			datum	1/4	MAC/GW	9/7/2006
173	natural	180	188			datum	1/4	EMM/CRP	9/6/2006
174	natural	180	188			datum	1/4	EMM/CRP	9/6/2006
175	natural	180	188	183		datum	1/4	EMM/CRP	9/6/2006
176	arbitrary	170	180			datum	1/4	NIO/CRP	9/7/2006
177	arbitrary	130	140			datum	1/4	EMM/SS	9/7/2006

Cat	Provenience Comments
147	yellow brown sand concentrated in the southeastern portion of unit
148	yellow brown sand concentrated in the southeastern portion of unit
149	yellow brown sand concentrated in the southeastern portion of unit
150	
151	
152	
153	
154	
155	base of excavation is removal of dark soil to underlying yellow brown silty sand, slightly mottled; minimal rodent disturbance
156	base of excavation is removal of dark soil to underlying yellow brown silty sand, slightly mottled; minimal rodent disturbance
157	minimal rodent disturbance; charcoal flecking is present; one bucket soil screened through 1/8" mesh
158	one bucket screened through 1/8" mesh
159	one bucket screened through 1/8" mesh
160	one bucket screened through 1/8" mesh
161	one bucket screened through 1/8" mesh
162	base of excavation is complete removal of dark soil to underlying light sand; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
163	base of excavation is complete removal of dark soil to underlying light sand; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
164	one bucket soil screened through 1/8" mesh
165	one bucket soil screened through 1/8" mesh; level starts mottled, becomes more solid dark brown/black, then transitions to mottled in southeast corner
166	minimal rodent disturbance; one bucket soil screened through 1/8" mesh; northwest corner still in overburden soil
167	minimal rodent disturbance; one bucket soil screened through 1/8" mesh; northwest corner still in overburden soil
168	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
169	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
170	wall scraping for profile
171	dark soil remains mostly in south and west edges; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
172	dark soil remains mostly in south and west edges; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
173	base of excavation complete removal of dark sand to underlying yellow brown sand; one bucket soil screened through 1/8" mesh; charcoal flecking present
174	base of excavation complete removal of dark sand to underlying yellow brown sand; one bucket soil screened through 1/8" mesh; charcoal flecking present
175	base of excavation complete removal of dark sand to underlying yellow brown sand; one bucket soil screened through 1/8" mesh; charcoal flecking present
176	one bucket soil screened through 1/8" mesh
177	one bucket soil screened through 1/8" mesh

Cat	Artifact Comments
147	
148	
149	
150	
151	
152	point plot 3
153	point plot 1
154	
155	
156	
157	
158	
159	
160	
161	
162	
163	
164	
165	
166	
167	
168	
169	point plot 2
170	point plot 1; polished stone
171	
172	
173	
174	
175	
176	
177	point plot 3

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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	178	179	bone	148		201					2
2009.013	179	180	flaking debris	148		201					3
2009.013	180	181	bone	148		201					3
2009.013	181	182	flaking debris	148		201					4
2009.013	182	183	bone	148		201					4
2009.013	183	184	bone	146		201					2
2009.013	184	185	ground stone	146	0.18	201	0.4				3
2009.013	185	186	flaking debris	146		201					3
2009.013	186	187	bone	146		201					3
2009.013	187	188	flaking debris	148		200					4
2009.013	188	189	bone	148		200					4
2009.013	189	190	bone	146		201					4
2009.013	190	191	flaking debris	146		201					4
2009.013	191	192	flaking debris	146		201					5
2009.013	192	193	bone	146		201					5
2009.013	193	194	bone	146	0.53	201	0.23				5
2009.013	194	195	ground stone	146	0.64	201	0.54				4
2009.013	195	196	flaking debris	149		201					3
2009.013	196	197	bone	149		201					3
2009.013	197	198	manuport	149	0.94	201	0.13				4
2009.013	198	199	flaking debris	149		201					4
2009.013	199	200	bone	149		201					4
2009.013	200	201	bone	144		200					4
2009.013	201	202	flaking debris	147		201					1
2009.013	202	203	flaking debris	147		201					2
2009.013	203	204	bone	147		201					2
2009.013	204	205	bone	147		201					3
2009.013	205	206	flaking debris	147		201					3
2009.013	206	207	flaking debris	147		201					4
2009.013	207	208	bone	147		201					4
2009.013	208	209	flaking debris	147		201					5
2009.013	209	210	bone	147		201					5
2009.013	210	211	bone	145		196					3
2009.013	211	212	bone	143		196					6

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
178	arbitrary	130	140			datum	1/4	EMM/SS	9/7/2006
179	arbitrary	140	150			datum	1/4	EMM/SS	9/7/2006
180	arbitrary	140	150			datum	1/4	EMM/SS	9/7/2006
181	arbitrary	150	160			datum	1/8	EMM/CEC	9/8/2006
182	arbitrary	150	160			datum	1/8	EMM/CEC	9/8/2006
183	arbitrary	131	140			datum	1/4	MAC/GW	9/8/2006
184	arbitrary	140	150	146		datum	1/8	MAC/GW	9/8/2006
185	arbitrary	140	150			datum	1/8	MAC/GW	9/8/2006
186	arbitrary	140	150			datum	1/8	MAC/GW	9/8/2006
187	arbitrary	160	170			datum	1/4	GW/CEC/EMI	8/30/2006
188	arbitrary	160	170			datum	1/4	GW/CEC/EMI	8/30/2006
189	arbitrary	150	160			datum	1/8	MAC/GW	9/9/2006
190	arbitrary	150	160			datum	1/8	MAC/GW	9/9/2006
191	natural	160	172			datum	1/8	MAC/GW	9/9/2006
192	natural	160	172			datum	1/8	MAC/GW	9/9/2006
193	natural	160	172	162		datum	1/8	MAC/GW	9/9/2006
194	arbitrary	150	160	155		datum	1/8	MAC/GW	9/9/2006
195	arbitrary	140	150			datum	1/4	CEC/EMM	9/9/2006
196	arbitrary	140	150			datum	1/4	CEC/EMM	9/9/2006
197	arbitrary	150	160	156		datum	1/4	CEC/EMM	9/9/2006
198	arbitrary	150	160			datum	1/4	CEC/EMM	9/9/2006
199	arbitrary	150	160			datum	1/4	CEC/EMM	9/9/2006
200	natural	161	170			datum	1/8	MAC/GW	9/7/2006
201	arbitrary	125	130			datum	1/4	MAC/GW	9/9/2006
202	arbitrary	130	140			datum	1/4	MAC/GW	9/10/2006
203	arbitrary	130	140			datum	1/4	MAC/GW	9/10/2006
204	arbitrary	140	150			datum	1/4	MAC/GW	9/10/2006
205	arbitrary	140	150			datum	1/4	MAC/GW	9/10/2006
206	arbitrary	150	160			datum	1/8	MAC/GW	9/10/2006
207	arbitrary	150	160			datum	1/8	MAC/GW	9/10/2006
208	natural	160	162			datum	1/8	MAC/GW	9/10/2006
209	natural	160	162			datum	1/8	MAC/GW	9/10/2006
210	arbitrary	150	160			datum	1/4	JW/SS	9/10/2006
211	arbitrary	190	200			datum	1/4	NIO/CRP	9/9/2006

Cat	Provenience Comments
178	one bucket soil screened through 1/8" mesh
179	one bucket soil screened through 1/8" mesh; charcoal flecking present
180	one bucket soil screened through 1/8" mesh; charcoal flecking present
181	dark cultural fill remains in west half
182	dark cultural fill remains in west half
183	one bucket soil screened through 1/8" mesh
184	moderately disturbance from rodents; charcoal present
185	moderately disturbance from rodents; charcoal present
186	moderately disturbance from rodents; charcoal present
187	lower portion (S) of dark soil screened through 1/8" mesh
188	lower portion (S) of dark soil screened through 1/8" mesh
189	some charcoal present; minimal rodent disturbance; dark soil remains in the west
190	some charcoal present; minimal rodent disturbance; dark soil remains in the west
191	base of excavation about 50% mottling of dark and light soils; slopes to west; east edge of F17, small house
192	base of excavation about 50% mottling of dark and light soils; slopes to west; east edge of F17, small house
193	base of excavation about 50% mottling of dark and light soils; slopes to west; east edge of F17, small house
194	some charcoal present; minimal rodent disturbance; dark soil remains in the west
195	one bucket soil screened through 1/8" mesh
196	one bucket soil screened through 1/8" mesh
197	one bucket soil screened through 1/8" mesh
198	one bucket soil screened through 1/8" mesh
199	one bucket soil screened through 1/8" mesh
200	base of excavation removed remaining dark soil to underlying yellow brown silty sand
201	one bucket soil screened through 1/8" mesh
202	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
203	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
204	one bucket soil screened through 1/8" mesh
205	one bucket soil screened through 1/8" mesh
206	minimal rodent disturbance; charcoal flecking present; F17 is small house, east edge
207	minimal rodent disturbance; charcoal flecking present; F17 is small house, east edge
208	F17 is small house, east edge; base of excavation is about 50% mottling of dark sand and underlying yellow brown silty sand
209	F17 is small house, east edge; base of excavation is about 50% mottling of dark sand and underlying yellow brown silty sand
210	carbonates level just above darker paleosol
211	one bucket soil screened through 1/8" mesh

Cat	Artifact Comments
178	
179	
180	
181	
182	point plot 1
183	unit floor scraping
184	unit floor scraping
185	unit floor scraping
186	unit floor scraping
187	house floor scraping
188	house floor scraping
189	
190	
191	
192	
193	
194	
195	
196	possible groundstone
197	
198	
199	
200	
201	very fragile
202	
203	
204	
205	
206	
207	
208	
209	
210	
211	

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	212	213	bone	143		196					7
2009.013	213	214	flake tool	145		201					2
2009.013	214	215	flaking debris	145		201					2
2009.013	215	216	bone	145		201					2
2009.013	216	217	flaking debris	146		196					3
2009.013	217	218	bone	146		196					4
2009.013	218	219	flaking debris	146		196					4
2009.013	219	220	bone	146		196					5
2009.013	220	221	flaking debris	146		196					5
2009.013	221	222	bone	146	0.66	196	0.55				5
2009.013	222	223	flaking debris	147		200					2
2009.013	223	224	bone	147		200					3
2009.013	224	225	flaking debris	147		200					3
2009.013	225	226	flaking debris	147		200					4
2009.013	226	227	bone	147		200					4
2009.013	227	228	flaking debris	143		201					3
2009.013	228	229	bone	143		201					3
2009.013	229	230	ground stone	143	0.89	201	0.43				3
2009.013	230	231	ground stone	143	0.96	201	0.7				3
2009.013	231	232	bone	143		201					4
2009.013	232	233	bone	148		196					4
2009.013	233	234	bone	148		196					5
2009.013	234	235	flaking debris	148		196					5
2009.013	235	236	manuport	148	0.2	196	0.97				5
2009.013	236	237	ground stone	148	0.89	196	0.66				5
2009.013	237	238	flaking debris	148		196					6
2009.013	238	239	bone	148		196					6
2009.013	239	240	flaking debris	144		196					3
2009.013	240	241	bone	144		196					3

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
212	arbitrary	200	210			datum	1/4	NIO/CRP	9/9/2006
213	arbitrary	130	140			datum	1/4	CEC/EMM	9/10/2006
214	arbitrary	130	140			datum	1/4	CEC/EMM	9/10/2006
215	arbitrary	130	140			datum	1/4	CEC/EMM	9/10/2006
216	arbitrary	160	170			datum	1/4	JW/SS	9/9/2006
217	arbitrary	170	180			datum	1/4	JW/SS	9/9/2006
218	arbitrary	170	180			datum	1/4	JW/SS	9/9/2006
219	arbitrary	180	190			datum	1/4	JW/SS	9/10/2006
220	arbitrary	180	190			datum	1/4	JW/SS	9/10/2006
221	arbitrary	180	190	190		datum	1/4	JW/SS	9/10/2006
222	arbitrary	142	150			datum	1/4	MAC/GW	9/9/2006
223	arbitrary	150	160			datum	1/4	MAC/GW	9/9/2006
224	arbitrary	150	160			datum	1/4	MAC/GW	9/9/2006
225	arbitrary	160	170			datum	1/8	MAC/GW	9/9/2006
226	arbitrary	160	170			datum	1/8	MAC/GW	9/9/2006
227	arbitrary	150	160			datum	1/4	EMM/CEC	9/9/2006
228	arbitrary	150	160			datum	1/4	EMM/CEC	9/9/2006
229	arbitrary	150	160	161		datum	1/4	EMM/CEC	9/9/2006
230	arbitrary	150	160	158		datum	1/4	EMM/CEC	9/9/2006
231	arbitrary	160	170			datum	1/4	EMM/CEC	9/10/2006
232	arbitrary	170	180			datum	1/4	NIO/CRP	9/10/2006
233	arbitrary	180	190			datum	1/4	NIO/CRP	9/10/2006
234	arbitrary	180	190			datum	1/4	NIO/CRP	9/10/2006
235	arbitrary	180	190	186		datum	1/4	NIO/CRP	9/10/2006
236	arbitrary	180	190	187		datum	1/4	NIO/CRP	9/10/2006
237	natural	190	197			datum	1/4	NIO/CRP	9/10/2006
238	natural	190	197			datum	1/4	NIO/CRP	9/10/2006
239	arbitrary	160	170			datum	1/4	JW/SS	9/11/2006
240	arbitrary	160	170			datum	1/4	JW/SS	9/11/2006

Cat	Provenience Comments
212	dark soil dips steeply in basin shape, probably represents old drainage; one bucket soil screened through 1/8" mesh
213	one bucket soil screened through 1/8" mesh
214	one bucket soil screened through 1/8" mesh
215	one bucket soil screened through 1/8" mesh
216	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
217	northwest corner disturbed by rodents; one bucket soil screened through 1/8" mesh
218	northwest corner disturbed by rodents; one bucket soil screened through 1/8" mesh
219	base of dark soil reached in all but NW corner; charcoal present at base, also hard with abundant carbonates; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
220	base of dark soil reached in all but NW corner; charcoal present at base, also hard with abundant carbonates; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
221	base of dark soil reached in all but NW corner; charcoal present at base, also hard with abundant carbonates; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
222	one bucket soil screened through 1/8" mesh; minimal rodent disturbance; northwest still in lighter soil
223	one bucket screened through 1/8" mesh; minimal rodent disturbance
224	one bucket screened through 1/8" mesh; minimal rodent disturbance
225	charcoal flecking present; moderate disturbance by rodents; mottling with yellow brown sand present in areas
226	charcoal flecking present; moderate disturbance by rodents; mottling with yellow brown sand present in areas
227	unit heavily disturbed by rodents; underlying yellow brown sand in southwest corner; one bucket soil screened through 1/8" mesh
228	unit heavily disturbed by rodents; underlying yellow brown sand in southwest corner; one bucket soil screened through 1/8" mesh
229	unit heavily disturbed by rodents; underlying yellow brown sand in southwest corner; one bucket soil screened through 1/8" mesh
230	unit heavily disturbed by rodents; underlying yellow brown sand in southwest corner; one bucket soil screened through 1/8" mesh
231	heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
232	one bucket soil screened through 1/8" mesh
233	one bucket soil screened through 1/8" mesh; heavy carbonate layer above and below dark cultural soil
234	one bucket soil screened through 1/8" mesh; heavy carbonate layer above and below dark cultural soil
235	one bucket soil screened through 1/8" mesh; heavy carbonate layer above and below dark cultural soil
236	one bucket soil screened through 1/8" mesh; heavy carbonate layer above and below dark cultural soil
237	one bucket soil screened through 1/8" mesh; base of excavation complete removal of dark soil to underlying yellow brown sand; moderate rodent disturbance
238	one bucket soil screened through 1/8" mesh; base of excavation complete removal of dark soil to underlying yellow brown sand; moderate rodent disturbance
239	some rodent disturbance
240	some rodent disturbance

Cat	Artifact Comments
212	
213	
214	refits w/cat.# 126 and 534
215	
216	
217	
218	
219	
220	
221	poss sling shot
222	
223	
224	
225	
226	
227	
228	
229	
230	
231	
232	
233	
234	
235	
236	
237	
238	
239	
240	

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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	241	242	bone	145		196					5
2009.013	242	243	bone	145		196					6
2009.013	243	244	bone	147		196					4
2009.013	244	245	bone	149		196					4
2009.013	245	246	flaking debris	148		201					5
2009.013	246	247	bone	148		201					5
2009.013	247	248	bone	149		201					5
2009.013	248	249	flaking debris	145		201					3
2009.013	249	250	bone	145		201					3
2009.013	250	251	bone	145	0.58	201	0.62				3
2009.013	251	252	other artifact	145	0.93	201	0.92				3
2009.013	252	253	bone	145		201					4
2009.013	253	254	flaking debris	149		202					3
2009.013	254	255	bone	149		202					3
2009.013	255	256	flaking debris	144		201					1
2009.013	256	257	bone	144		201					1
2009.013	257	258	bone	144		201					2
2009.013	258	259	flaking debris	144	0.4	201	0.55				2
2009.013	259	260	ground stone	144	0.46	201	0.93				2
2009.013	260	261	flaking debris	144		201					3
2009.013	261	262	bone	144		201					3
2009.013	262	263	ground stone	148	0.57	201	0.17				5
2009.013	263	264	bone	143		200					6
2009.013	264	265	bone	143		201					4
2009.013	265	266	bone	145		200					5
2009.013	266	267	flaking debris	147		200					4
2009.013	267	268	flaking debris	147		201					5
2009.013	268	269	bone	147		201					5
2009.013	269	270	bone	144		196					4
2009.013	270	271	flaking debris	144		196					5
2009.013	271	272	bone	147		202					3
2009.013	272	273	flaking debris	147		202					3
2009.013	273	274	bone	147		202					4
2009.013	274	275	flaking debris	147		202					4

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
241	arbitrary	170	180			datum	1/4	JW/SS	9/10/2006
242	natural	180	191			datum	1/4	JW	9/11/2006
243	arbitrary	170	180			datum	1/4	NIO/CRP	9/10/2006
244	arbitrary	170	180			datum	1/4	NIO/CRP	9/11/2006
245	natural	160	170			datum	1/8	MAC/GW	9/10/2006
246	natural	160	170			datum	1/8	MAC/GW	9/10/2006
247	natural	160	171			datum	1/8	GW/MAC	9/10/2006
248	arbitrary	140	150			datum	1/4	EMM	9/10/2006
249	arbitrary	140	150			datum	1/4	EMM	9/10/2006
250	arbitrary	140	150	144		datum	1/4	EMM	9/10/2006
251	arbitrary	140	150	144		datum	1/4	EMM	9/10/2006
252	natural	150	163			datum	1/8	EMM	9/10/2006
253	arbitrary	140	150			datum	1/4	GW/MAC	9/11/2006
254	arbitrary	140	150			datum	1/4	GW/MAC	9/11/2006
255	arbitrary	127	140			datum	1/4	CEC/EMM	9/11/2006
256	arbitrary	127	140			datum	1/4	CEC/EMM	9/11/2006
257	arbitrary	140	150			datum	1/4	CEC/EMM	9/11/2006
258	arbitrary	140	150	145		datum	1/4	CEC/EMM	9/11/2006
259	arbitrary	140	150	144		datum	1/4	CEC/EMM	9/11/2006
260	arbitrary	150	160			datum	1/4	CEC/EMM	9/11/2006
261	arbitrary	150	160			datum	1/4	CEC/EMM	9/11/2006
262	natural	160	170	170		datum	1/8	MAC/GW	9/10/2006
263	natural	180	184			datum	1/8	GW/CEC	8/28/2006
264	arbitrary	160	170			datum	1/4	EMM/CEC	9/10/2006
265	arbitrary	160	171			datum	1/8	NIO/JW	8/29/2006
266	arbitrary	160	170			datum	1/8	MAC/GW	9/9/2006
267	natural	160	162			datum	1/8	MAC/GW	9/10/2006
268	natural	160	162			datum	1/8	MAC/GW	9/10/2006
269	arbitrary	170	180			datum	1/4	JW	9/11/2006
270	natural	180	196			datum	1/4	JW/SS	9/12/2006
271	arbitrary	140	150			datum	1/4	MAC/GW	9/11/2006
272	arbitrary	140	150			datum	1/4	MAC/GW	9/11/2006
273	arbitrary	150	160			datum	1/8	MAC/GW	9/11/2006
274	arbitrary	150	160			datum	1/8	MAC/GW	9/11/2006

Cat	Provenience Comments
241	eastern portion out of dark paleosol; one bucket soil screened through 1/8" mesh; moderate disturbance by rodents
242	base of excavation was complete removal of darker soil to underlying yellow brown silty sand; one bucket soil screened through 1/8" mesh
243	moderate rodent disturbance; one bucket screened through 1/8" mesh
244	one bucket soil screened through 1/8" mesh
245	minimal disturbance by rodents; base of excavation about 50% mottled dark sand and yellow brown silty sand
246	minimal disturbance by rodents; base of excavation about 50% mottled dark sand and yellow brown silty sand
247	base of excavation is complete removal of dark soil to underlying yellow brown silty sand
248	one bucket soil screened through 1/8" mesh
249	one bucket soil screened through 1/8" mesh
250	one bucket soil screened through 1/8" mesh
251	one bucket soil screened through 1/8" mesh
252	base of excavation about 50% mottled between dark soil and yellow brown silty sand; slopes to the east
253	one bucket soil screened through 1/8" mesh
254	one bucket soil screened through 1/8" mesh
255	one bucket soil screened through 1/8" mesh; moderate rodent disturbance throughout
256	one bucket soil screened through 1/8" mesh; moderate rodent disturbance throughout
257	one bucket soil screened through 1/8" mesh; some yellow brown sand remains in southwest corner; minimal rodent disturbance
258	one bucket soil screened through 1/8" mesh; some yellow brown sand remains in southwest corner; minimal rodent disturbance
259	one bucket soil screened through 1/8" mesh; some yellow brown sand remains in southwest corner; minimal rodent disturbance
260	underlying yellow brown sand in northwest and northeast corners; moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
261	underlying yellow brown sand in northwest and northeast corners; moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
262	minimal disturbance by rodents; base of excavation about 50% mottled dark sand and yellow brown silty sand
263	base of excavation removed dark brown/black soil to underlying yellow brown sand; heavily disturbed by rodents
264	heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
265	
266	charcoal flecking present; moderate disturbance by rodents; mottling with yellow brown sand present in areas
267	F17 is small house, east edge; base of excavation is about 50% mottling of dark sand and underlying yellow brown silty sand
268	F17 is small house, east edge; base of excavation is about 50% mottling of dark sand and underlying yellow brown silty sand
269	some rodent disturbance in the southwest corner; one bucket soil screened through 1/8" mesh
270	one bucket soil screened through 1/8" mesh; base of excavation was complete removal of darker soil to underlying yellow brown silty sand
271	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
272	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
273	moderate rodent disturbance; transitioning to mottled yellow brown and dark soil
274	moderate rodent disturbance; transitioning to mottled yellow brown and dark soil

Cat	Artifact Comments
241	
242	
243	
244	
245	
246	
247	
248	point plot 1
249	point plot 2
250	
251	
252	
253	
254	
255	point plot 1
256	
257	
258	
259	
260	
261	
262	
263	
264	
265	
266	
267	wall fall, 170-190 cmbd
268	
269	
270	
271	
272	
273	
274	from wall scraping

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	275	276	ground stone	147	0.34	202	0.65				4
2009.013	276	277	bone	147		202					5
2009.013	277	278	bone	143		202					3
2009.013	278	279	bone	143		202					4
2009.013	279	280	ground stone	143	0.75	202	0.78				4
2009.013	280	281	flaking debris	143		202					5
2009.013	281	282	bone	143		202					5
2009.013	282	283	ground stone	143		202					5
2009.013	283	284	flaking debris	149		196					5
2009.013	284	285	projectile point	145		202					2
2009.013	285	286	flaking debris	145		202					3
2009.013	286	287	bone	145		202					3
2009.013	287	288	flaking debris	145		202					4
2009.013	288	289	bone	145		202					4
2009.013	289	290	ground stone	145	0.04	202	0.75				4
2009.013	290	291	flaking debris	143		202					6
2009.013	291	292	flake tool	143		202					6
2009.013	292	293	bone	143		202					6
2009.013	293	294	bone	147	0.95	200	0.15				5
2009.013	294	295	bone	147		200					5
2009.013	295	296	flaking debris	147		200					5
2009.013	296	297	flaking debris	147		200					6
2009.013	297	298	bone	147		200					6
2009.013	298	299	manuport	147	0.28	200	0.08				6
2009.013	299	300	ground stone		147.32		200.02	2	west		
2009.013	300	301	bone	144		201					4
2009.013	301	302	bone	143		201					5
2009.013	302	303	bone	143		202					7
2009.013	303	304	biface	149		203					2
2009.013	304	305	bone	148		202					1

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
275	arbitrary	150	160	159		datum	1/8	MAC/GW	9/11/2006
276	natural	160	169			datum	1/4	SS	9/12/2006
277	arbitrary	140	150			datum	1/4	EMM/CEC	9/12/2006
278	arbitrary	150	160			datum	1/4	CEC	9/12/2006
279	arbitrary	150	160	162		datum	1/4	CEC	9/12/2006
280	arbitrary	160	170			datum	1/8	CEC/JW	9/12/2006
281	arbitrary	160	170			datum	1/8	CEC/JW	9/12/2006
282	arbitrary	160	170			datum	1/8	CEC/JW	9/12/2006
283	natural	180	190			datum	1/4	NIO/CRP	9/11/2006
284	arbitrary	120	131			datum	1/4	NIO/CRP	9/12/2006
285	arbitrary	131	140			datum	1/4	NIO	9/12/2006
286	arbitrary	131	140			datum	1/4	NIO	9/12/2006
287	natural	140	150			datum	1/4	NIO/CRP	9/12/2006
288	natural	140	150			datum	1/4	NIO/CRP	9/12/2006
289	natural	140	150	148		datum	1/4	NIO/CRP	9/12/2006
290	arbitrary	170	180			datum	1/8	JW	9/12/2006
291	arbitrary	170	180			datum	1/8	JW	9/12/2006
292	arbitrary	170	180			datum	1/8	JW	9/12/2006
293	arbitrary	170	180	180		datum	1/4	MAC/GW	9/19/2006
294	arbitrary	170	180			datum	1/4	MAC/GW	9/19/2006
295	arbitrary	170	180			datum	1/4	MAC/GW	9/19/2006
296	arbitrary	180	190			datum	1/8	EMM/GW	9/19/2006
297	arbitrary	180	190			datum	1/8	EMM/GW	9/19/2006
298	arbitrary	180	190	189		datum	1/8	EMM/GW	9/19/2006
299	natural	200	207	189		datum	1/8	GW/CEC	9/20/2006
300	natural	160	175			datum	1/4	CEC/NIO	9/19/2006
301	natural	170	177			datum	1/4	NIO/CEC	9/19/2006
302	natural	180	190			datum	1/4	CEC/NIO	9/19/2006
303	arbitrary	120	130			datum	1/4	HR/HD	9/19/2006
304	arbitrary	123	130			datum	1/4	CEC/JW	9/13/2006

Cat	Provenience Comments
275	moderate rodent disturbance; transitioning to mottled yellow brown and dark soil
276	base of excavation about 50% mottled dark and light sands; moderate rodent disturbance; charcoal flecking present
277	moderately disturbed by rodents; yellow brown sediment discarded without screening, darker soil screened
278	rodent disturbance throughout; one bucket soil screened through 1/8" mesh
279	rodent disturbance throughout; one bucket soil screened through 1/8" mesh
280	heavily disturbed by rodents throughout
281	heavily disturbed by rodents throughout
282	heavily disturbed by rodents throughout
283	one bucket soil screened through 1/8" mesh; base of excavation complete removal of mottled dark sand to underlying yellow brown silty sand
284	one bucket soil screened through 1/8" mesh
285	one bucket soil screened through 1/8" mesh
286	one bucket soil screened through 1/8" mesh
287	one bucket screened through 1/8" mesh; base of excavation about 50% mottled of dark and light soils
288	one bucket screened through 1/8" mesh; base of excavation about 50% mottled of dark and light soils
289	one bucket screened through 1/8" mesh; base of excavation about 50% mottled of dark and light soils
290	heavily disturbed by rodents throughout; dark soil removed to top of underlying yellow brown silty sand except in central and southern portion; F18 is poss house or occupied depression
291	heavily disturbed by rodents throughout; dark soil removed to top of underlying yellow brown silty sand except in central and southern portion; F18 is poss house or occupied depression
292	heavily disturbed by rodents throughout; dark soil removed to top of underlying yellow brown silty sand except in central and southern portion; F18 is poss house or occupied depression
293	transitions to mottled yellow brown on east side; moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
294	transitions to mottled yellow brown on east side; moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
295	transitions to mottled yellow brown on east side; moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
296	near floor of F17, small house, on east side
297	near floor of F17, small house, on east side
298	near floor of F17, small house, on east side
299	all fill collected; charcoal date returned 7190 +/- 50 BP; large, shallow basin; interior basin of F17, small house
300	base of excavation removal of remainder of dark soil to top of underlying yellow brown silty sand; level disturbed by rodents
301	base of excavation was complete removal of dark sediment to underlying sand
302	base of excavation was remainder of dark soil to underlying yellow brown silty sand, some mottling present; dark soil mostly in rodent burrows; one bucket soil screened through 1/8" mesh
303	
304	

Cat	Artifact Comments
275	
276	
277	
278	
279	
280	
281	
282	
283	wall scraping
284	wall scraping
285	
286	
287	
288	point plot 1
289	point plot 2
290	
291	
292	
293	
294	
295	wall collapse
296	
297	
298	
299	
300	
301	
302	
303	
304	

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	305	306	flaking debris	148		202					3
2009.013	306	307	bone	148		202					3
2009.013	307	308	bone	148		202					4
2009.013	308	309	flaking debris	146		202					3
2009.013	309	310	bone	146		202					4
2009.013	310	311	bone	146		202					5
2009.013	311	312	bone	146		202					6
2009.013	312	313	flaking debris	146		202					6
2009.013	313	314	ground stone	146	0.1	202	0.87				5
2009.013	314	315	flaking debris	146		200					6
2009.013	315	316	bone	146		200					6
2009.013	316	317	biface	146	0.92	200	0.1				6
2009.013	317	318	flaking debris	146		200					7
2009.013	318	319	bone	146		200					7
2009.013	319	320	flaking debris	144		202					4
2009.013	320	321	bone	144		202					4
2009.013	321	322	ground stone	144	0.65	202	0.95				4
2009.013	322	323	ground stone	144	0.8	202	0.4				4
2009.013	323	324	flaking debris	144		202					5
2009.013	324	325	bone	144		202					5
2009.013	325	326	bone	144		202					6
2009.013	326	327	flaking debris	146		200					8
2009.013	327	328	bone	146		200					8
2009.013	328	329	bone	146	0.31	200	0.14				8
2009.013	329	330	bone					4	east		
2009.013	330	331	flaking debris	147		200					7
2009.013	331	332	bone	147		200					7
2009.013	332	333	flaking debris					2	east		
2009.013	333	334	bone					2	east		

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
305	arbitrary	140	150			datum	1/4	GW/JW	9/13/2006
306	arbitrary	140	150			datum	1/4	GW/JW	9/13/2006
307	natural	150	166			datum	1/8	GW/JW/SS	9/13/2006
308	arbitrary	120	130			datum	1/4	MAC	9/13/2006
309	arbitrary	130	140			datum	1/4	MAC	9/13/2006
310	arbitrary	140	150			datum	1/8	MAC/EMM	9/19/2006
311	arbitrary	150	160			datum	1/4	MAC/EMM	9/19/2006
312	arbitrary	150	160			datum	1/4	MAC/EMM	9/19/2006
313	arbitrary	140	150	147		datum	1/8	MAC/EMM	9/19/2006
314	arbitrary	170	180			datum	1/4	MAC/SS	9/19/2006
315	arbitrary	170	180			datum	1/4	MAC/SS	9/19/2006
316	arbitrary	170	180	171		datum	1/4	MAC/SS	9/19/2006
317	arbitrary	180	190			datum	1/8	MAC/SS	9/19/2006
318	arbitrary	180	190			datum	1/8	MAC/SS	9/19/2006
319	arbitrary	140	150			datum	1/4	NIO	9/13/2006
320	arbitrary	140	150			datum	1/4	NIO	9/13/2006
321	arbitrary	140	150	145		datum	1/4	NIO	9/13/2006
322	arbitrary	140	150	150		datum	1/4	NIO	9/13/2006
323	arbitrary	150	160			datum	1/4	NIO/CEC	9/19/2006
324	arbitrary	150	160			datum	1/4	NIO/CEC	9/19/2006
325	natural	160	170			datum	1/8	NIO/CEC	9/19/2006
326	natural	190	194			datum	1/8	SS	9/19/2006
327	natural	190	194			datum	1/8	SS	9/19/2006
328	natural	190	194	194		datum	1/8	SS	9/19/2006
329	natural	190	214			datum	1/8	SS	9/20/2006
330	natural	190	196			datum	1/8	EMM/GW	9/19/2006
331	natural	190	196			datum	1/8	EMM/GW	9/19/2006
332	natural	200	207			datum	1/8	GW	9/20/2006
333	natural	200	207			datum	1/8	GW	9/20/2006

Cat	Provenience Comments
305	one bucket soil screened through 1/8" mesh; moderate disturbance by rodents; charcoal flecking present
306	one bucket soil screened through 1/8" mesh; moderate disturbance by rodents; charcoal flecking present
307	moderate disturbance by rodents; base of excavation about 50% mottled dark and light sands; charcoal flecking present
308	
309	finished 9/19/2006; one bucket soil screened through 1/8" mesh; most of unit in dark soil
310	moderate disturbance by rodents; southwest portion of unit very mottled
311	black soil remains in northeast portion of unit; moderate disturbance by rodents throughout level; one bucket soil screened through 1/8" mesh
312	black soil remains in northeast portion of unit; moderate disturbance by rodents throughout level; one bucket soil screened through 1/8" mesh
313	moderate disturbance by rodents; southwest portion of unit very mottled
314	dark soil in west was screened through 1/8" mesh; rest was 1/4" with one bucket 1/8" screened; charcoal abundant; moderate rodent disturbance throughout
315	dark soil in west was screened through 1/8" mesh; rest was 1/4" with one bucket 1/8" screened; charcoal abundant; moderate rodent disturbance throughout
316	dark soil in west was screened through 1/8" mesh; rest was 1/4" with one bucket 1/8" screened; charcoal abundant; moderate rodent disturbance throughout
317	top of F2 (shallow circular pit) and F4 (circular pit) in west of unit, near floor of F17, small house; east portion of unit in underlying yellow brown silty sand
318	top of F2 (shallow circular pit) and F4 (circular pit) in west of unit, near floor of F17, small house; east portion of unit in underlying yellow brown silty sand
319	one bucket soil screened through 1/8" mesh; moderate rodent disturbance
320	one bucket soil screened through 1/8" mesh; moderate rodent disturbance
321	one bucket soil screened through 1/8" mesh; moderate rodent disturbance
322	one bucket soil screened through 1/8" mesh; moderate rodent disturbance
323	one bucket soil screened through 1/8" mesh; dark soil still present in southeast portion of unit; heavy disturbance by rodents
324	one bucket soil screened through 1/8" mesh; dark soil still present in southeast portion of unit; heavy disturbance by rodents
325	base of excavation is about 50% mottling of dark brown and yellow brown soils; heavily disturbed by rodents
326	base of excavation is about 50% mottled dark and light soils; F2 completely removed in level, F4 still visible at base; F17 is small house
327	base of excavation is about 50% mottled dark and light soils; F2 completely removed in level, F4 still visible at base; F17 is small house
328	base of excavation is about 50% mottled dark and light soils; F2 completely removed in level, F4 still visible at base; F17 is small house
329	interior feature of F17, small house; fill screened through 1/8" mesh in field; large, deep basin
330	floor of F17, small house, on east side; east half of F2, shallow circular pit; base of excavation is about 50% mottling dark and light soils
331	floor of F17, small house, on east side; east half of F2, shallow circular pit; base of excavation is about 50% mottling dark and light soils
332	fill screened through 1/8" mesh; large shallow basin; interior feature of F17, small house
333	fill screened through 1/8" mesh; large shallow basin; interior feature of F17, small house

Cat	Artifact Comments
305	
306	
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308	scraping from the south wall
309	
310	
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312	
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318	
319	
320	
321	
322	
323	
324	very fragile
325	
326	
327	
328	
329	
330	
331	
332	
333	

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	334	335	flaking debris	145		200					6
2009.013	335	336	bone	145		200					6
2009.013	336	337	flaking debris	145	0.33	200					7
2009.013	337	338	bone	145		200					7
2009.013	338	339	bone	145		200					8
2009.013	339	340	flaking debris	148		200					5
2009.013	340	341	flaking debris	148		200					5
2009.013	341	342	bone	148		200					5
2009.013	342	343	ground stone	148	0.57	200	0.65				5
2009.013	343	344	flaking debris	148		200					6
2009.013	344	345	bone	148		200					6
2009.013	345	346	flaking debris	145		203					
2009.013	346	347	flaking debris	148		203					2
2009.013	347	348	flaking debris	148		203					3
2009.013	348	349	bone	148		203					4
2009.013	349	350	flaking debris	147		203					3
2009.013	350	351	bone	147		203					5
2009.013	351	352	flaking debris	147		203					5
2009.013	352	353	bone	147		203					6
2009.013	353	354	flaking debris	143		203					
2009.013	354	355	bone	143		203					
2009.013	355	356	bone	143		203					4
2009.013	356	357	flaking debris	143		203					5
2009.013	357	358	bone	143		203					5
2009.013	358	359	flake tool	143	0.69	203	0.83				5
2009.013	359	360	ground stone	143	0.94	203	0.72				5
2009.013	360	361	flaking debris	143		203					6
2009.013	361	362	bone	143		203					6
2009.013	362	363	flaking debris	143		203					7
2009.013	363	364	bone	143		203					7
2009.013	364	366	bone	144		203					
2009.013	365	367	bone	144		203					2

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
334	arbitrary	171	180			datum	1/8	EMM/GW	9/20/2006
335	arbitrary	171	180			datum	1/8	EMM/GW	9/20/2006
336	arbitrary	180	190	182		datum	1/8	EMM/GW	9/20/2006
337	arbitrary	180	190			datum	1/8	EMM/GW	9/20/2006
338	natural	190	193			datum	1/8	EMM/GW	9/20/2006
339	arbitrary	170	180			datum	1/4	GW/EMM	9/20/2006
340	arbitrary	170	180			datum	1/4	GW/EMM	9/20/2006
341	arbitrary	170	180			datum	1/4	GW/EMM	9/20/2006
342	arbitrary	170	180	183		datum	1/4	GW/EMM	9/20/2006
343	natural	180	192			datum	1/8	GW/EMM	9/20/2006
344	natural	180	192			datum	1/8	GW/EMM	9/20/2006
345	arbitrary	100	156			datum	1/4	CEC	9/20/2006
346	arbitrary	120	130			datum	1/4	HR/MAC	9/20/2006
347	arbitrary	130	140			datum	1/4	HR/MAC	9/20/2006
348	arbitrary	140	150			datum	1/4	HR/MAC	9/20/2006
349	arbitrary	121	130			datum	1/4	HR/MAC	9/20/2006
350	arbitrary	140	150			datum	1/4	HR/MAC	9/20/2006
351	arbitrary	140	150			datum	1/4	HR/MAC	9/20/2006
352	arbitrary	150	160			datum	1/8	MAC	9/21/2006
353	arbitrary	110	183			datum	1/8	CEC	9/21/2006
354	arbitrary	110	183			datum	1/8	CEC	9/21/2006
355	arbitrary	140	150			datum	1/4	NIO/PBM	9/21/2006
356	arbitrary	150	160			datum	1/4	NIO/PBM	9/21/2006
357	arbitrary	150	160			datum	1/4	NIO/PBM	9/21/2006
358	arbitrary	150	160	159		datum	1/4	NIO/PBM	9/21/2006
359	arbitrary	150	160	158		datum	1/4	NIO/PBM	9/21/2006
360	arbitrary	160	170			datum	1/4	NIO/PBM	9/21/2006
361	arbitrary	160	170			datum	1/4	NIO/PBM	9/21/2006
362	natural	170	183			datum	1/4	NIO/PBM	9/21/2006
363	natural	170	183			datum	1/4	NIO/PBM	9/21/2006
364	arbitrary	102	166			datum	1/4	GW/SS	9/21/2006
365	arbitrary	120	130			datum	1/4	GW/SS	9/21/2006

Cat	Provenience Comments
334	dark brown sand present in the northwest corner, mottled yellow brown sand and dark sand in northwest portion
335	dark brown sand present in the northwest corner, mottled yellow brown sand and dark sand in northwest portion
336	mottled dark soil only in northwest; F17 is southeast corner of small house
337	mottled dark soil only in northwest; F17 is southeast corner of small house
338	base of excavation about 50% mottling between darker and lighter soils; slopes to the northwest
339	one bucket soil screened through 1/8" mesh; dark soil remains in southwest and southeast corners, represents north wall of F17, small house
340	one bucket soil screened through 1/8" mesh; dark soil remains in southwest and southeast corners, represents north wall of F17, small house
341	one bucket soil screened through 1/8" mesh; dark soil remains in southwest and southeast corners, represents north wall of F17, small house
342	one bucket soil screened through 1/8" mesh; dark soil remains in southwest and southeast corners, represents north wall of F17, small house
343	base of excavation is about 50% mottled dark and light sands; minimal rodent disturbance; floor of F17, small house
344	base of excavation is about 50% mottled dark and light sands; minimal rodent disturbance; floor of F17, small house
345	wall scraping for profile
346	
347	one bucket screened through 1/8" mesh; charcoal flecking present
348	one bucket soil screened through 1/8" mesh
349	minimal rodent disturbance
350	one bucket soil screened through 1/8" mesh, minimal rodent disturbance
351	one bucket soil screened through 1/8" mesh, minimal rodent disturbance
352	mottled yellow brown sand in central portion of unit; heavy disturbance by rodents
353	wall scraping for profile
354	wall scraping for profile
355	level heavily disturbed by rodents throughout; one bucket soil screened through 1/8" mesh
356	heavily disturbed by rodents throughout level; charcoal flecking present; one bucket soil screened through 1/8" mesh
357	heavily disturbed by rodents throughout level; charcoal flecking present; one bucket soil screened through 1/8" mesh
358	heavily disturbed by rodents throughout level; charcoal flecking present; one bucket soil screened through 1/8" mesh
359	heavily disturbed by rodents throughout level; charcoal flecking present; one bucket soil screened through 1/8" mesh
360	level is almost entirely disturbed by rodents; one bucket soil screened through 1/8" mesh
361	level is almost entirely disturbed by rodents; one bucket soil screened through 1/8" mesh
362	level almost entirely disturbed by rodents; base of excavation complete removal of intact dark soil to underlying yellow brown silty sand; one bucket soil screened through 1/8" mesh
363	level almost entirely disturbed by rodents; base of excavation complete removal of intact dark soil to underlying yellow brown silty sand; one bucket soil screened through 1/8" mesh
364	wall collapse
365	moderate disturbance by rodents

Cat	Artifact Comments
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343	
344	
345	
346	
347	
348	
349	includes several fragile long bones
350	point plot 1
351	point plot 2
352	
353	point plot 1
354	
355	
356	
357	
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363	
364	
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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	366	368	flaking debris	144		203					3
2009.013	367	369	bone	144		203					3
2009.013	368	370	flaking debris	144		203					4
2009.013	369	371	bone	144		203					4
2009.013	370	372	flaking debris	144		203					5
2009.013	371	373	bone	144		203					5
2009.013	372	374	flake tool	144	0.5	203	0.22				5
2009.013	373	375	ground stone	144	0.33	203	0.33				5
2009.013	374	376	flaking debris	147		203					6
2009.013	375	377	bone	147		203					6
2009.013	376	378	bone	143		202					
2009.013	377	379	bone	149		204					2
2009.013	378	380	flaking debris	145		195					2
2009.013	379	381	bone	147		204					2
2009.013	380	382	bone	147		204					3
2009.013	381	383	flaking debris	148		204					2
2009.013	382	384	bone	148		204					2
2009.013	383	385	bone	146		203					3
2009.013	384	386	flaking debris	146		203					3
2009.013	385	387	bone	146		203					4
2009.013	386	388	flaking debris	146		203					4
2009.013	387	389	bone	146		203					5
2009.013	388	390	bone	146		203					6
2009.013	389	391	bone	148		204					3
2009.013	390	392	bone	145		203					2
2009.013	391	393	flake tool	145		203					2
2009.013	392	394	flaking debris	145		203					3
2009.013	393	395	bone	145		203					3

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
366	arbitrary	130	140			datum	1/4	GW/SS	9/21/2006
367	arbitrary	130	140			datum	1/4	GW/SS	9/21/2006
368	arbitrary	140	150			datum	1/4	GW/SS	9/21/2006
369	arbitrary	140	150			datum	1/4	GW/SS	9/21/2006
370	arbitrary	150	160			datum	1/4	GW	9/22/2006
371	arbitrary	150	160			datum	1/4	GW	9/22/2006
372	arbitrary	150	160	153		datum	1/4	GW	9/22/2006
373	arbitrary	150	160	159		datum	1/4	GW	9/22/2006
374	arbitrary	150	160			datum	1/8	MAC	9/21/2006
375	arbitrary	150	160			datum	1/8	MAC	9/21/2006
376	arbitrary	118	180			datum	1/8	CEC	9/22/2006
377	arbitrary	110	120			datum	1/4	NIO	9/22/2006
378	arbitrary	170	180			datum	1/4	CEC/EMM	9/22/2006
379	arbitrary	110	120			datum	1/4	EMM	9/22/2006
380	arbitrary	120	130			datum	1/4	EMM	9/22/2006
381	arbitrary	120	130			datum	1/4	NIO/PBM	9/22/2006
382	arbitrary	120	130			datum	1/4	NIO/PBM	9/22/2006
383	arbitrary	120	130			datum	1/4	MAC/EMM	9/21/2006
384	arbitrary	120	130			datum	1/4	MAC/EMM	9/21/2006
385	arbitrary	130	140			datum	1/4	MAC/EMM	9/21/2006
386	arbitrary	130	140			datum	1/4	MAC/EMM	9/21/2006
387	arbitrary	140	150			datum	1/4	MAC/EMM	9/21/2006
388	natural	150	162			datum	1/8	MAC/EMM	9/21/2006
389	arbitrary	130	140			datum	1/4	NIO/PBM	9/22/2006
390	arbitrary	110	120			datum	1/4	CEC/GW	9/20/2006
391	arbitrary	110	120			datum	1/4	CEC/GW	9/20/2006
392	arbitrary	120	130			datum	1/4	CEC/GW	9/20/2006
393	arbitrary	120	130			datum	1/4	CEC/GW	9/20/2006

Cat	Provenience Comments
366	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
367	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
368	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
369	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
370	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh; level becomes increasingly mottled, starting at the north and sloping south
371	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh; level becomes increasingly mottled, starting at the north and sloping south
372	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh; level becomes increasingly mottled, starting at the north and sloping south
373	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh; level becomes increasingly mottled, starting at the north and sloping south
374	mottled yellow brown sand in central portion of unit; heavy disturbance by rodents
375	mottled yellow brown sand in central portion of unit; heavy disturbance by rodents
376	scraping from the south wall for the profile
377	one bucket soil screened through 1/8" mesh; cultural soil is amorphous and not well defined in this unit
378	
379	
380	one bucket soil screened through 1/8" mesh
381	one bucket soil screened through 1/8" mesh; northwest corner is reddish brown mottled with dark brown/black and yellow brown sand, prob representing rodent disturbance
382	one bucket soil screened through 1/8" mesh; northwest corner is reddish brown mottled with dark brown/black and yellow brown sand, prob representing rodent disturbance
383	moderate rodent disturbance
384	moderate rodent disturbance
385	moderate disturbance by rodents; one bucket soil screened through 1/8" mesh
386	moderate disturbance by rodents; one bucket soil screened through 1/8" mesh
387	one bucket soil screened through 1/8" mesh; moderate rodent disturbance
388	base of excavation about 50% mottling dark and light soils; dark soil remained only in the northwest corner
389	one bucket soil screened through 1/8" mesh
390	moderate rodent disturbance throughout level
391	moderate rodent disturbance throughout level
392	minimal rodent disturbance
393	minimal rodent disturbance

Cat	Artifact Comments
366	
367	
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369	
370	
371	
372	
373	
374	
375	
376	
377	
378	
379	
380	
381	
382	
383	scraping from east wall for profile
384	
385	
386	
387	
388	
389	point plot 1
390	
391	
392	
393	

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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	394	396	flaking debris	145		203					4
2009.013	395	397	flake tool	145		203					4
2009.013	396	398	bone	145		203					4
2009.013	397	399	ground stone	145	0.22	203	0.04				4
2009.013	398	400	tested raw material	145	0.02	203	0.03				4
2009.013	399	401	flaking debris	145		203					5
2009.013	400	402	bone	145		203					5
2009.013	401	403	flaking debris	145		203					6
2009.013	402	404	bone	145		203					6
2009.013	403	405	bone	149		195					3
2009.013	404	406	flaking debris	143		195					3
2009.013	405	407	flaking debris	143		195					4
2009.013	406	408	flaking debris	143		195					5
2009.013	407	409	bone	144		195					3
2009.013	408	410	flaking debris	144		195					4
2009.013	409	411	bone	144		195					4
2009.013	410	412	flaking debris	144		195					5
2009.013	411	413	flaking debris	144		203					6
2009.013	412	414	bone	144		203					6
2009.013	413	415	bone	144	0.5	203	0.29				6
2009.013	414	416	bone	144	0.53	203	0.82				6
2009.013	415	417	bone	146		195					4
2009.013	416	418	flake tool	146	0.32	204	0.13				3
2009.013	417	419	flaking debris	146	0.85	204	0.28				2
2009.013	418	420	flaking debris	146		204					3
2009.013	419	421	flaking debris	148		195					4
2009.013	420	422	bone	148		195					4

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
394	arbitrary	130	140			datum	1/4	CEC/GW	9/20/2006
395	arbitrary	130	140			datum	1/4	CEC/GW	9/20/2006
396	arbitrary	130	140			datum	1/4	CEC/GW	9/20/2006
397	arbitrary	130	140	141		datum	1/4	CEC/GW	9/20/2006
398	arbitrary	130	140	141		datum	1/4	CEC/GW	9/20/2006
399	arbitrary	140	150			datum	1/4	CEC/GW	9/21/2006
400	arbitrary	140	150			datum	1/4	CEC/GW	9/21/2006
401	natural	150	156			datum	1/8	GW	9/21/2006
402	natural	150	156			datum	1/8	GW	9/21/2006
403	arbitrary	190	200			datum	1/4	NIO/PBM	9/23/2006
404	arbitrary	180	190			datum	1/4	SS	9/24/2006
405	arbitrary	190	200			datum	1/4	SS	9/24/2006
406	arbitrary	200	210			datum	1/4	SS/GW	9/24/2006
407	arbitrary	180	190			datum	1/4	EMM/CEC	9/23/2006
408	arbitrary	190	200			datum	1/4	EMM/CEC	9/23/2006
409	arbitrary	190	200			datum	1/4	EMM/CEC	9/23/2006
410	natural	200	216			datum	1/4	EMM/CEC	9/23/2006
411	natural	160	169			datum	1/4	GW	9/23/2006
412	natural	160	169			datum	1/4	GW	9/23/2006
413	natural	160	169	162		datum	1/4	GW	9/23/2006
414	natural	160	169	161		datum	1/4	GW	9/23/2006
415	natural	190	202			datum	1/4	GW	9/24/2006
416	arbitrary	110	120	114		datum	1/4	NIO/PBM	9/24/2006
417	arbitrary	100	110	107		datum	1/4	PBM/NIO/SS	9/23/2006
418	arbitrary	110	120			datum	1/4	NIO/PBM	9/24/2006
419	arbitrary	190	200			datum	1/4	NIO/PBM	9/23/2006
420	arbitrary	190	200			datum	1/4	NIO/PBM	9/23/2006

Cat	Provenience Comments
394	heavy rodent disturbance in south portion of unit; one bucket soil screened through 1/8" mesh
395	heavy rodent disturbance in south portion of unit; one bucket soil screened through 1/8" mesh
396	heavy rodent disturbance in south portion of unit; one bucket soil screened through 1/8" mesh
397	heavy rodent disturbance in south portion of unit; one bucket soil screened through 1/8" mesh
398	heavy rodent disturbance in south portion of unit; one bucket soil screened through 1/8" mesh
399	heavily disturbed by rodents in the south half; one bucket soil screened through 1/8" mesh
400	heavily disturbed by rodents in the south half; one bucket soil screened through 1/8" mesh
401	base of excavation is about 50% mottling of dark and light sands; heavy disturbance of rodents in the southern portion
402	base of excavation is about 50% mottling of dark and light sands; heavy disturbance of rodents in the southern portion
403	one bucket soil screened through 1/8" mesh
404	very little rodent disturbance
405	little rodent disturbance; one bucket soil screened through 1/8" mesh
406	one bucket soil screened through 1/8" mesh; some rodent disturbance and insect castings
407	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
408	one bucket soil screened through 1/8" mesh; dark soil slopes to the southwest, top of yellow brown silty sand starts in northeast and continues for most of unit
409	one bucket soil screened through 1/8" mesh; dark soil slopes to the southwest, top of yellow brown silty sand starts in northeast and continues for most of unit
410	base of excavation complete removal of dark soil to underlying yellow brown silty sand; one bucket soil screened through 1/8" mesh
411	base of excavation about 50% mottled yellow brown silty sand and dark soil; heavily disturbed by rodents; charcoal flecking present; one bucket soil screened through 1/8" mesh
412	base of excavation about 50% mottled yellow brown silty sand and dark soil; heavily disturbed by rodents; charcoal flecking present; one bucket soil screened through 1/8" mesh
413	base of excavation about 50% mottled yellow brown silty sand and dark soil; heavily disturbed by rodents; charcoal flecking present; one bucket soil screened through 1/8" mesh
414	base of excavation about 50% mottled yellow brown silty sand and dark soil; heavily disturbed by rodents; charcoal flecking present; one bucket soil screened through 1/8" mesh
415	base of excavation is about 70% mottled yellow brown silty sand with darker soil; carbonates thicker; minimal rodent disturbance
416	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
417	level not screened, overburden
418	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
419	one bucket soil screened through 1/8" mesh
420	one bucket soil screened through 1/8" mesh

Cat	Artifact Comments
394	
395	bone awl
396	point plot 2; poss sling shot
397	point plot 1
398	point plot 3
399	point plot 4
400	
401	
402	
403	
404	
405	
406	see also FS 604
407	
408	
409	
410	
411	
412	
413	point plot 1
414	point plot 2; refits w/cat.# 511
415	
416	
417	point plot 1
418	point plot 2
419	
420	

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	421	423	bone	148		195					5
2009.013	422	424	bone	148		204					4
2009.013	423	425	bone	148		204					5
2009.013	424	426	flaking debris	147		195					3
2009.013	425	427	ground stone	147		195					3
2009.013	426	428	flaking debris	147		195					4
2009.013	427	429	flaking debris	147		204					4
2009.013	428	430	flaking debris	147		204					5
2009.013	429	431	flake tool	147		204					5
2009.013	430	432	bone	147		204					5
2009.013	431	433	flaking debris	146		204					4
2009.013	432	434	bone	146		204					4
2009.013	433	435	bone	143		195					6
2009.013	434	436	projectile point	146		204					5
2009.013	435	437	flaking debris	146		204					5
2009.013	436	438	ground stone	146	0.44	204	0.27				5
2009.013	437	439	flaking debris	147		204					6
2009.013	438	440	bone	147		204					6
2009.013	439	441	flaking debris	144		204					3
2009.013	440	442	bone	144		204					3
2009.013	441	443	flaking debris	146		204					6
2009.013	442	444	bone	146		204					6
2009.013	443	445	bone	147		205					
2009.013	444	446	ground stone	142	0.93	201	0.11				2
2009.013	445	447	bone	142		201					2
2009.013	446	448	ground stone	144	0.5	204	0.02				4
2009.013	447	449	flaking debris	144		204					4
2009.013	448	450	bone	144		204					4
2009.013	449	451	flake tool	144	0.25	204					5
2009.013	450	452	flaking debris	144		204					5
2009.013	451	453	bone	144		204					5

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
421	natural	200	205			datum	1/4	NIO/PBM	9/23/2006
422	arbitrary	140	150			datum	1/4	NIO/PBM	9/23/2006
423	arbitrary	150	160			datum	1/4	NIO/PBM	9/23/2006
424	arbitrary	180	190			datum	1/4	NIO/PBM	9/24/2006
425	arbitrary	180	190			datum	1/4	NIO/PBM	9/24/2006
426	natural	190	202			datum	1/4	NIO/PBM	9/24/2006
427	arbitrary	130	140			datum	1/4	EMM	9/23/2006
428	arbitrary	140	150			datum	1/4	EMM	9/24/2006
429	arbitrary	140	150			datum	1/4	EMM	9/24/2006
430	arbitrary	140	150			datum	1/4	EMM	9/24/2006
431	arbitrary	120	130			datum	1/4	NIO/PBM	9/24/2006
432	arbitrary	120	130			datum	1/4	NIO/PBM	9/24/2006
433	natural	210	222			datum	1/4	GW	9/24/2006
434	arbitrary	130	140			datum	1/4	NIO/PBM	9/24/2006
435	arbitrary	130	140			datum	1/4	NIO/PBM	9/24/2006
436	arbitrary	130	140	137		datum	1/4	NIO/PBM	9/24/2006
437	arbitrary	150	160			datum	1/4	eMM	9/24/2006
438	arbitrary	150	160			datum	1/4	eMM	9/24/2006
439	arbitrary	120	130			datum	1/4	GW/SS	9/25/2006
440	arbitrary	120	130			datum	1/4	GW/SS	9/25/2006
441	arbitrary	140	150			datum	1/4	NIO/PBM	9/24/2006
442	arbitrary	140	150			datum	1/4	NIO/PBM	9/24/2006
443	arbitrary	89	169			datum	1/8	CEC	9/25/2006
444	arbitrary	140	150	146		datum	1/4	SS/CEC	9/25/2006
445	arbitrary	140	150			datum	1/4	SS/CEC	9/25/2006
446	arbitrary	130	140	137		datum	1/4	GW/SS	9/25/2006
447	arbitrary	130	140			datum	1/4	GW/SS	9/25/2006
448	arbitrary	130	140			datum	1/4	GW/SS	9/25/2006
449	arbitrary	140	150	141		datum	1/4	GW/SS	9/25/2006
450	arbitrary	140	150			datum	1/4	GW/SS	9/25/2006
451	arbitrary	140	150			datum	1/4	GW/SS	9/25/2006

Cat	Provenience Comments
421	base of excavation is complete removal of dark sand to underlying yellow brown sand; one bucket soil screened through 1/8" mesh; minimal rodent disturbance
422	dark soil remains along southern edge of unit; one bucket screened through 1/8" mesh
423	remaining stain in southeast corner represent northwest edge of F15, a small house
424	one bucket soil screened through 1/8" mesh
425	one bucket soil screened through 1/8" mesh
426	minimal rodent disturbance; one bucket soil screened through 1/8" mesh; base of excavation complete removal of dark soil to underlying yellow brown silty sand
427	one bucket soil screened through 1/8" mesh
428	minimal rodent disturbance; charcoal flecking present; one bucket soil screened through 1/8" mesh
429	minimal rodent disturbance; charcoal flecking present; one bucket soil screened through 1/8" mesh
430	minimal rodent disturbance; charcoal flecking present; one bucket soil screened through 1/8" mesh
431	one bucket soil screened through 1/8" mesh
432	one bucket soil screened through 1/8" mesh
433	one bucket screened through 1/8" mesh; moderate rodent disturbance; base of excavation is complete removal of dark brown sand to underlying yellow brown sand; charcoal flecking present
434	one bucket soil screened through 1/8" mesh
435	one bucket soil screened through 1/8" mesh
436	one bucket soil screened through 1/8" mesh
437	transitions to mottled yellow brown and dark sands in northwest; charcoal flecking present; two buckets soil screened through 1/8" mesh
438	transitions to mottled yellow brown and dark sands in northwest; charcoal flecking present; two buckets soil screened through 1/8" mesh
439	mostly disturbed by rodents, particularly in southwest corner; one bucket soil screened through 1/8" mesh
440	mostly disturbed by rodents, particularly in southwest corner; one bucket soil screened through 1/8" mesh
441	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
442	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
443	scraping from east wall for profile
444	some rodent disturbance; cultural fill mostly absent in western and southern portion of unit; one bucket soil screened through 1/8" mesh
445	some rodent disturbance; cultural fill mostly absent in western and southern portion of unit; one bucket soil screened through 1/8" mesh
446	complete disturbance by rodents in southwest corner; one bucket soil screened through 1/8" mesh
447	complete disturbance by rodents in southwest corner; one bucket soil screened through 1/8" mesh
448	complete disturbance by rodents in southwest corner; one bucket soil screened through 1/8" mesh
449	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
450	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
451	heavy rodent disturbance throughout level; one bucket soil screened through 1/8" mesh

Cat	Artifact Comments
421	
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432	
433	wall scraping
434	
435	
436	
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448	point plot 1, from rodent burrow
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451	

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	452	454	flaking debris	144		204					6
2009.013	453	455	bone	144		204					6
2009.013	454	456	modified bone	144		204					6
2009.013	455	457	manuport	144	0.77	204	0.3				6
2009.013	456	458	ground stone	144	0.19	204	0.8				6
2009.013	457	459	bone	144	0.75	204	0.4				6
2009.013	458	460	bone	144	0.75	204	0.17				6
2009.013	459	461	bone	148		205					3
2009.013	460	462	flaking debris	148		205					4
2009.013	461	463	bone	148		205					4
2009.013	462	464	flaking debris	148		205					5
2009.013	463	465	bone	148		205					5
2009.013	464	466	bone	148		205					6
2009.013	465	467	bone	143		204					4
2009.013	466	468	bone	143		204					5
2009.013	467	469	flaking debris	143		204					5
2009.013	468	470	bone	143		204					6
2009.013	469	471	flaking debris	143		204					6
2009.013	470	472	flake tool	143	0.83	204	0.1				6
2009.013	471	473	flake tool	143		204	0.03				6
2009.013	472	474	flaking debris	143		204					7
2009.013	473	475	bone	143		204					7
2009.013	474	476	bone	143	0.45	204	0.18				7

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
452	natural	150	163			datum	1/4	GW/SS	9/25/2006
453	natural	150	163			datum	1/4	GW/SS	9/25/2006
454	natural	150	163			datum	1/4	GW/SS	9/25/2006
455	natural	150	163	154		datum	1/4	GW/SS	9/25/2006
456	natural	150	163	152		datum	1/4	GW/SS	9/25/2006
457	natural	150	163	157		datum	1/4	GW/SS	9/25/2006
458	natural	150	163	152		datum	1/4	GW/SS	9/25/2006
459	arbitrary	110	120			datum	1/4	NIO/PBM	9/24/2006
460	arbitrary	120	130			datum	1/4	NIO/PBM	9/26/2006
461	arbitrary	120	130			datum	1/4	NIO/PBM	9/26/2006
462	arbitrary	130	140			datum	1/4	NIO/PBM	9/26/2006
463	arbitrary	130	140			datum	1/4	NIO/PBM	9/26/2006
464	arbitrary	140	154			datum	1/8	NIO/PBM	9/26/2006
465	arbitrary	130	140			datum	1/4	GW/AM	9/26/2006
466	arbitrary	140	150			datum	1/4	GW/AM	9/26/2006
467	arbitrary	140	150			datum	1/4	GW/AM	9/26/2006
468	arbitrary	150	160			datum	1/4	GW/AM	9/26/2006
469	arbitrary	150	160			datum	1/4	GW/AM	9/26/2006
470	arbitrary	150	160	157		datum	1/4	GW/AM	9/26/2006
471	arbitrary	150	160	154		datum	1/4	GW/AM	9/26/2006
472	arbitrary	160	170			datum	1/8	GW/AM	9/26/2006
473	arbitrary	160	170			datum	1/8	GW/AM	9/26/2006
474	arbitrary	160	170	166		datum	1/8	GW/AM	9/26/2006

Cat	Provenience Comments
452	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
453	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
454	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
455	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
456	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
457	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
458	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
459	minimal disturbance by rodents; one bucket soil screened through 1/8" mesh
460	one bucket soil screened through 1/8" mesh
461	one bucket soil screened through 1/8" mesh
462	one bucket soil screened through 1/8" mesh; most of unit to north is about 50% mottled dark and light sands
463	one bucket soil screened through 1/8" mesh; most of unit to north is about 50% mottled dark and light sands
464	floor of unit is about 50% mottled of dark and light soils
465	mostly disturbed by rodents throughout level; one bucket screened through 1/8" mesh
466	heavily disturbed by rodents throughout level; one bucket soil screened through 1/8" mesh
467	heavily disturbed by rodents throughout level; one bucket soil screened through 1/8" mesh
468	less rodent disturbance than previous levels; near top of yellow brown silty sand in northwest corner; one bucket soil screened through 1/8" mesh
469	less rodent disturbance than previous levels; near top of yellow brown silty sand in northwest corner; one bucket soil screened through 1/8" mesh
470	less rodent disturbance than previous levels; near top of yellow brown silty sand in northwest corner; one bucket soil screened through 1/8" mesh
471	less rodent disturbance than previous levels; near top of yellow brown silty sand in northwest corner; one bucket soil screened through 1/8" mesh
472	some rodent disturbance; mottled yellow brown silty sand throughout most of base of level, except in west; F18 is possible house or occupied depression
473	some rodent disturbance; mottled yellow brown silty sand throughout most of base of level, except in west; F18 is possible house or occupied depression
474	some rodent disturbance; mottled yellow brown silty sand throughout most of base of level, except in west; F18 is possible house or occupied depression

Cat	Artifact Comments
452	
453	
454	
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457	
458	point plot 1
459	point plot 2; refits w/cat.# 471
460	point plot 1
461	
462	
463	point plot 3
464	point plot 2
465	
466	
467	
468	
469	
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471	
472	
473	
474	

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	475	477	bone	143	0.12	204	0.2				7
2009.013	476	478	flaking debris	143		204					8
2009.013	477	479	bone	143		204					8
2009.013	478	480	bone	145		204					4
2009.013	479	481	ground stone	145		204					5
2009.013	480	482	bone	145		204					5
2009.013	481	483	flaking debris	145		204					6
2009.013	482	484	bone	145		204					6
2009.013	483	485	flaking debris	145		204					7
2009.013	484	486	bone	145		204					7
2009.013	485	487	ground stone	145	0.46	204	0.09				7
2009.013	486	488	flaking debris	142		201					3
2009.013	487	489	bone	142		201					3
2009.013	488	490	ground stone	142	0.87	201	0.85				3
2009.013	489	491	bone	143		204					
2009.013	490	492	bone	146		205					4
2009.013	491	493	bone	149		206					1
2009.013	492	494	bone	141		201					1
2009.013	493	495	mineral	141		201					1
2009.013	494	497	flaking debris	145		205					2
2009.013	495	498	bone	145		205					3
2009.013	496	499	bone	145		205					4
2009.013	497	500	flaking debris	145		205					4
2009.013	498	501	flaking debris	145		205					5
2009.013	499	502	bone	145		205					5
2009.013	500	503	biface	145		205					5
2009.013	501	504	flaking debris	142	0.66	204	0.56				2
2009.013	502	505	bone	142		204					3

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
475	arbitrary	160	170	167		datum	1/8	GW/AM	9/26/2006
476	natural	170	179			datum	1/8	GW/AM	9/26/2006
477	natural	170	179			datum	1/8	GW/AM	9/26/2006
478	arbitrary	120	130			datum	1/4	EMM	9/25/2006
479	arbitrary	130	140			datum	1/4	EMM/CEC	9/25/2006
480	arbitrary	130	140			datum	1/4	EMM/CEC	9/25/2006
481	arbitrary	140	150			datum	1/4	EMM/CEC	9/26/2006
482	arbitrary	140	150			datum	1/4	EMM/CEC	9/26/2006
483	arbitrary	150	161			datum	1/8	EMM/CEC	9/26/2006
484	arbitrary	150	161			datum	1/8	EMM/CEC	9/26/2006
485	arbitrary	150	161			datum	1/8	EMM/CEC	9/26/2006
486	natural	150	160			datum	1/4	CEC/EMM	9/26/2006
487	natural	150	160			datum	1/4	CEC/EMM	9/26/2006
488	natural	150	160	157		datum	1/4	CEC/EMM	9/26/2006
489	arbitrary	99	162			datum	1/8	CEC	9/27/2006
490	arbitrary	110	120			datum	1/4	NIO/PBM	10/3/2006
491	arbitrary	89	100			datum	1/4	NIO/PBM	10/3/2006
492	arbitrary	119	130			datum	1/4	EMM	10/3/2006
493	arbitrary	119	130			datum	1/4	EMM	10/3/2006
494	arbitrary	100	110			datum	1/4	HD/CK	9/27/2006
495	arbitrary	110	120			datum	1/4	MAC	10/3/2006
496	arbitrary	120	130			datum	1/4	MAC	10/3/2006
497	arbitrary	120	130			datum	1/4	MAC	10/3/2006
498	arbitrary	130	140			datum	1/4	MAC	10/3/2006
499	arbitrary	130	140			datum	1/4	MAC	10/3/2006
500	arbitrary	130	140			datum	1/4	MAC	10/3/2006
501	arbitrary	110	120	120		datum	1/4	GW/CEC	9/27/2006
502	arbitrary	120	130			datum	1/4	GW/CEC	9/27/2006

Cat	Provenience Comments
475	some rodent disturbance; mottled yellow brown silty sand throughout most of base of level, except in west; F18 is possible house or occupied depression
476	base of excavation is about 50% mottling of dark soil with underlying yellow brown silty sand; some pockets of dark soil remain, likely rodent; F18 poss house or occupied depression
477	base of excavation is about 50% mottling of dark soil with underlying yellow brown silty sand; some pockets of dark soil remain, likely rodent; F18 poss house or occupied depression
478	one bucket soil screened through 1/8" mesh; minimal disturbance by rodents
479	one bucket soil screened through 1/8" mesh
480	one bucket soil screened through 1/8" mesh
481	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
482	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
483	heavily disturbed by rodents, particularly in the southeast portion
484	heavily disturbed by rodents, particularly in the southeast portion
485	heavily disturbed by rodents, particularly in the southeast portion
486	heavy rodent disturbance; cultural fill thin in this unit, mostly in north 1/2; base of excavation in north is about 50% mottled yellow brown silty sand and dark soil; one bucket 1/8" screened
487	heavy rodent disturbance; cultural fill thin in this unit, mostly in north 1/2; base of excavation in north is about 50% mottled yellow brown silty sand and dark soil; one bucket 1/8" screened
488	heavy rodent disturbance; cultural fill thin in this unit, mostly in north 1/2; base of excavation in north is about 50% mottled yellow brown silty sand and dark soil; one bucket 1/8" screened
489	wall scraping for profile
490	two buckets screened through 1/8" mesh; minimal rodent disturbance
491	level not screened, overburden
492	one bucket soil screened through 1/8" mesh
493	one bucket soil screened through 1/8" mesh
494	
495	minimal disturbance by rodents; one bucket soil screened through 1/8" mesh
496	one bucket screened through 1/8" mesh
497	one bucket screened through 1/8" mesh
498	one bucket soil screened through 1/8" mesh
499	one bucket soil screened through 1/8" mesh
500	one bucket soil screened through 1/8" mesh
501	some rodent disturbance; only brown/black soil was screened, rest was not screened
502	moderate rodent disturbance, some charcoal flecking; one bucket soil screened through 1/8" mesh

Cat	Artifact Comments
475	
476	
477	
478	
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481	wall fall
482	
483	
484	refits w/cat.# 126 and 291
485	
486	
487	
488	point plot 1
489	point plot 2
490	
491	
492	
493	
494	
495	
496	
497	point plot 1
498	
499	
500	
501	
502	see also FS 602, 738

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	503	506	flaking debris	142		204					3
2009.013	504	507	flaking debris	142		204					4
2009.013	505	508	bone	142		204					4
2009.013	506	509	ground stone	142	0.77	204	0.73				4
2009.013	507	510	bone	142		204					5
2009.013	508	511	bone	142		204					6
2009.013	509	512	flaking debris	142		204					6
2009.013	510	513	biface	142	0.05	204	0.21				7
2009.013	511	514	flake tool	142	0.97	204	0.02				6
2009.013	512	515	ground stone	142	0.36	204	0.7				6
2009.013	513	516	flaking debris	142		204					7
2009.013	514	517	bone	142		204					7
2009.013	515	518	ground stone	142	0.95	204	0.45				7
2009.013	516	519	ground stone	142	0.94	204	0.17				7
2009.013	517	520	bone	142		204					8
2009.013	518	521	flaking debris	142		204					8
2009.013	519	522	flaking debris	141		201					2
2009.013	520	523	bone	141		201					2
2009.013	521	524	bone	145		205					6
2009.013	522	525	flaking debris	145		205					7
2009.013	523	526	bone	145		205					7
2009.013	524	527	flaking debris	146		205					4
2009.013	525	528	bone	146		205					5
2009.013	526	529	flaking debris	146		205					5
2009.013	527	530	bone	146		205					6
2009.013	528	531	flaking debris	146		205					7
2009.013	529	532	bone	146		205					7
2009.013	530	533	flake tool	146	0.47	205	0.7				7
2009.013	531	534	bone	142		202					
2009.013	532	535	bone	142		202					1
2009.013	533	536	bone	142		202					2
2009.013	534	537	flake tool	142		202					2

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
503	arbitrary	120	130			datum	1/4	GW/CEC	9/27/2006
504	arbitrary	130	140			datum	1/4	GW/SS	10/3/2006
505	arbitrary	130	140			datum	1/4	GW/SS	10/3/2006
506	arbitrary	130	140	140		datum	1/4	GW/SS	10/3/2006
507	arbitrary	140	150			datum	1/4	GW/CEC	10/3/2006
508	arbitrary	150	160			datum	1/8	GW/CEC	10/3/2006
509	arbitrary	150	160			datum	1/8	GW/CEC	10/3/2006
510	arbitrary	160	171	161		datum	1/8	GW/CEC	10/4/2006
511	arbitrary	150	160	154		datum	1/8	GW/CEC	10/3/2006
512	arbitrary	150	160	154		datum	1/8	GW/CEC	10/3/2006
513	arbitrary	160	171			datum	1/8	GW/CEC	10/4/2006
514	arbitrary	160	171			datum	1/8	GW/CEC	10/4/2006
515	arbitrary	160	171	164		datum	1/8	GW/CEC	10/4/2006
516	arbitrary	160	171	167		datum	1/8	GW/CEC	10/4/2006
517	natural	171	178			datum	1/8	GW/CEC	10/4/2006
518	natural	171	178			datum	1/8	GW/CEC	10/4/2006
519	natural	130	139			datum	1/4	EMM/SD	10/3/2006
520	natural	130	139			datum	1/4	EMM/SD	10/3/2006
521	arbitrary	140	150			datum	1/4	MAC/SD/EMM	10/3/2006
522	arbitrary	150	160			datum	1/4	SD/EMM	10/4/2006
523	arbitrary	150	160			datum	1/4	SD/EMM	10/4/2006
524	arbitrary	110	120			datum	1/4	NIO/PBM	10/3/2006
525	arbitrary	120	130			datum	1/4	NIO/PBM	10/3/2006
526	arbitrary	120	130			datum	1/4	NIO/PBM	10/3/2006
527	arbitrary	130	140			datum	1/4	NIO/PBM	10/3/2006
528	arbitrary	140	150			datum	1/8	NIO/PBM	10/4/2006
529	arbitrary	140	150			datum	1/8	NIO/PBM	10/4/2006
530	arbitrary	140	150	146		datum	1/8	NIO/PBM	10/4/2006
531	arbitrary	120	175			datum	1/8	CEC/EMM	9/27/2006
532	arbitrary	112	130			datum	1/4	GW/AM	9/27/2006
533	arbitrary	130	140			datum	1/4	EMM/AM	9/27/2006
534	arbitrary	130	140			datum	1/4	EMM/AM	9/27/2006

Cat	Provenience Comments
503	moderate rodent disturbance, some charcoal flecking; one bucket soil screened through 1/8" mesh
504	heavy rodent disturbance; one bucket soil screened through 1/8" mesh
505	heavy rodent disturbance; one bucket soil screened through 1/8" mesh
506	heavy rodent disturbance; one bucket soil screened through 1/8" mesh
507	level is mostly rodent disturbance with very little undisturbed soil remaining; one bucket soil screened through 1/8" mesh
508	dark soil mostly in the northwest and west portion of unit, down to yellow brown silty sand in rest; heavily disturbed by rodents
509	dark soil mostly in the northwest and west portion of unit, down to yellow brown silty sand in rest; heavily disturbed by rodents
510	dark soil remains in northwest corner, rest is mottled yellow brown silty sand; heavily disturbed by rodents; charcoal flecking present
511	dark soil mostly in the northwest and west portion of unit, down to yellow brown silty sand in rest; heavily disturbed by rodents
512	dark soil mostly in the northwest and west portion of unit, down to yellow brown silty sand in rest; heavily disturbed by rodents
513	dark soil remains in northwest corner, rest is mottled yellow brown silty sand; heavily disturbed by rodents; charcoal flecking present
514	dark soil remains in northwest corner, rest is mottled yellow brown silty sand; heavily disturbed by rodents; charcoal flecking present
515	dark soil remains in northwest corner, rest is mottled yellow brown silty sand; heavily disturbed by rodents; charcoal flecking present
516	dark soil remains in northwest corner, rest is mottled yellow brown silty sand; heavily disturbed by rodents; charcoal flecking present
517	base of excavation at about 50% mottled yellow brown silty sand and dark soil; heavily disturbed by rodents; F18 is possible house or occupied depression
518	base of excavation at about 50% mottled yellow brown silty sand and dark soil; heavily disturbed by rodents; F18 is possible house or occupied depression
519	two buckets of soil screened through 1/8" mesh; dark soil fades throughout level to yellow brown sand
520	two buckets of soil screened through 1/8" mesh; dark soil fades throughout level to yellow brown sand
521	minimal disturbance by rodents; charcoal flecking throughout; one bucket soil screened through 1/8" mesh
522	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
523	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
524	two buckets screened through 1/8" mesh; minimal rodent disturbance
525	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
526	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
527	one bucket screened through 1/8" mesh; minimal rodent disturbance
528	minimal rodent disturbance
529	minimal rodent disturbance
530	minimal rodent disturbance
531	wall fall
532	one bucket soil screened through 1/8" mesh
533	some rodent disturbance; yellow brown sand still in north 1/2 unit; one bucket soil screened through 1/8" mesh
534	some rodent disturbance; yellow brown sand still in north 1/2 unit; one bucket soil screened through 1/8" mesh

Cat	Artifact Comments
503	
504	
505	
506	
507	
508	
509	
510	
511	
512	
513	
514	
515	
516	
517	
518	
519	point plot 1
520	
521	south wall scraping
522	point plot 1
523	
524	poss sling shot
525	
526	
527	point plot 1
528	point plot 2
529	point plot 3
530	point plot 1
531	basin floor scraping
532	basin floor scraping
533	
534	

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	535	538	bone	142		202					3
2009.013	536	539	bone	142		202					4
2009.013	537	540	flaking debris	142		202					4
2009.013	538	541	flake tool	142	0.62	202	0.08				4
2009.013	539	542	hammer stone	142	0.05	202	0.91				4
2009.013	540	544	flaking debris	142		202					5
2009.013	541	545	bone	142		202					5
2009.013	542	546	flaking debris	142		202					6
2009.013	543	547	bone	142		202					6
2009.013	544	548	flaking debris	147		205					3
2009.013	545	549	bone	147		205					3
2009.013	546	550	ground stone	147	0.33	205	0.2				3
2009.013	547	551	bone	147		205					4
2009.013	548	552	flaking debris	147		205					5
2009.013	549	553	bone	147		205					6
2009.013	550	554	bone	147		205					7
2009.013	551	555	bone	142		203					2
2009.013	552	556	flaking debris	142		203					3
2009.013	553	557	bone	142		203					3
2009.013	554	558	bone	142		203					4
2009.013	555	559	flaking debris	142		203					4
2009.013	556	560	flaking debris	142		203					5
2009.013	557	561	bone	142		203					5
2009.013	558	563	flaking debris	141		202					2
2009.013	559	564	bone	141		202					2
2009.013	560	565	flaking debris	141		202					3
2009.013	561	566	bone	141		202					3
2009.013	562	567	bone	143		205					3
2009.013	563	568	bone	141		202					4
2009.013	564	569	flaking debris	141		202					4
2009.013	565	570	core	141	0.84	202	0.38				4
2009.013	566	571	bone	141	0.97	202	0.87				5

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
535	arbitrary	140	150			datum	1/4	EMM/AM	9/27/2006
536	arbitrary	150	160			datum	1/4	EMM/AM	9/27/2006
537	arbitrary	150	160			datum	1/4	EMM/AM	9/27/2006
538	arbitrary	150	160	154		datum	1/4	EMM/AM	9/27/2006
539	arbitrary	150	160	155		datum	1/4	EMM/AM	9/27/2006
540	arbitrary	160	170			datum	1/8	EMM	10/3/2006
541	arbitrary	160	170			datum	1/8	EMM	10/3/2006
542	natural	170	178			datum	1/8	EMM	10/3/2006
543	natural	170	178			datum	1/8	EMM	10/3/2006
544	arbitrary	110	120			datum	1/4	NIO/PBM	9/27/2006
545	arbitrary	110	120			datum	1/4	NIO/PBM	9/27/2006
546	arbitrary	110	120	119		datum	1/4	NIO/PBM	9/27/2006
547	arbitrary	120	130			datum	1/4	NIO/PBM	9/27/2006
548	arbitrary	130	140			datum	1/4	NIO/PBM	9/27/2006
549	arbitrary	140	150			datum	1/4	NIO/PBM	10/3/2006
550	arbitrary	150	161			datum	1/8	NIO/PBM	10/3/2006
551	arbitrary	120	130			datum	1/8	GW	10/4/2006
552	arbitrary	130	140			datum	1/8	GW	10/4/2006
553	arbitrary	130	140			datum	1/8	GW	10/4/2006
554	arbitrary	140	150			datum	1/8	GW/CEC	10/4/2006
555	arbitrary	140	150			datum	1/8	GW/CEC	10/4/2006
556	arbitrary	150	160			datum	1/8	GW/CEC	10/4/2006
557	arbitrary	150	160			datum	1/8	GW/CEC	10/4/2006
558	arbitrary	120	130			datum	1/4	EMM/SD	10/4/2006
559	arbitrary	120	130			datum	1/4	EMM/SD	10/4/2006
560	arbitrary	130	140			datum	1/4	EMM/SD	10/4/2006
561	arbitrary	130	140			datum	1/4	EMM/SD	10/4/2006
562	arbitrary	120	130			datum	1/4	KJP/PBM	10/4/2006
563	arbitrary	140	150			datum	1/4	EMM/SD	10/4/2006
564	arbitrary	140	150			datum	1/4	EMM/SD	10/4/2006
565	arbitrary	140	150	143		datum	1/4	EMM/SD	10/4/2006
566	natural	150	158	153		datum	1/8	EMM	10/5/2006

Cat	Provenience Comments
535	yellow brown silty sand in rest of unit; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
536	dark soil slopes to NE; heavy rodent disturbance; one bucket soil screened through 1/8" mesh
537	dark soil slopes to NE; heavy rodent disturbance; one bucket soil screened through 1/8" mesh
538	dark soil slopes to NE; heavy rodent disturbance; one bucket soil screened through 1/8" mesh
539	dark soil slopes to NE; heavy rodent disturbance; one bucket soil screened through 1/8" mesh
540	cultural fill remains in north end of unit; heavily disturbed by rodents; F18 is possible house or occupied depression
541	cultural fill remains in north end of unit; heavily disturbed by rodents; F18 is possible house or occupied depression
542	base of excavation is about 50% mottled yellow brown silty sand with dark brown/black sand; NE portion entirely disturbed by rodents
543	base of excavation is about 50% mottled yellow brown silty sand with dark brown/black sand; NE portion entirely disturbed by rodents
544	one bucket soil screened through 1/8" mesh
545	one bucket soil screened through 1/8" mesh
546	one bucket soil screened through 1/8" mesh
547	one bucket soil screened through 1/8" mesh; carbonates increase in western portion of unit
548	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
549	two buckets soil screened through 1/8" mesh
550	
551	only cultural fill was screened, rest was not screened; rodent disturbance moderate
552	moderate rodent disturbance; only dark cultural fill was screened, brown sandy clay was not screened
553	moderate rodent disturbance; only dark cultural fill was screened, brown sandy clay was not screened
554	moderate to heavy rodent disturbance; only dark cultural fill was screened, brown sand clay not screened
555	moderate to heavy rodent disturbance; only dark cultural fill was screened, brown sand clay not screened
556	unit is mostly disturbed by rodents
557	unit is mostly disturbed by rodents
558	lighter yellow brown sand in south; one bucket soil screened through 1/8" mesh
559	lighter yellow brown sand in south; one bucket soil screened through 1/8" mesh
560	removed dark soil from most of unit, remains in northeast 1/4; one bucket soil screened through 1/8" mesh
561	removed dark soil from most of unit, remains in northeast 1/4; one bucket soil screened through 1/8" mesh
562	moderate rodent disturbance throughout level; one bucket soil screened through 1/8" mesh, taken from black soil in southwest corner
563	dark soil remains in northeast corner only; underlying subsoil is yellow brown sand; one bucket soil screened through 1/8" mesh
564	dark soil remains in northeast corner only; underlying subsoil is yellow brown sand; one bucket soil screened through 1/8" mesh
565	dark soil remains in northeast corner only; underlying subsoil is yellow brown sand; one bucket soil screened through 1/8" mesh
566	dark soil present only in northeast corner, excavated to base of dark soil; base of excavation is about 50% yellow brown and dark soil; F18 is potential 3rd house feature or an occupied depression

Cat	Artifact Comments
535	
536	
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541	
542	unit floor scraping
543	unit floor scraping, see also FS 526
544	
545	
546	unit floor scraping
547	unit floor scraping
548	basin floor scraping
549	
550	
551	see also FS 554 and 738
552	
553	see also FS 466
554	
555	refits w/cat.# 614
556	
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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	567	572	bone	141		202					5
2009.013	568	573	bone	141		202					
2009.013	569	576	ground stone	142	0.22	203	0.96				5
2009.013	570	577	manuport	142		203					5
2009.013	571	578	bone	142		203					6
2009.013	572	579	flaking debris	142		203					6
2009.013	573	580	ground stone	142	0.36	203	0.03				5
2009.013	574	581	ground stone	142	0.62	203	0.96				6
2009.013	575	582	ground stone	142	0.1	203	0.96				6
2009.013	576	583	ground stone	142	0.89	203	0.82				7
2009.013	577	584	flaking debris	143		203					7
2009.013	578	585	flake tool	143	0.75	204	0.26				8
2009.013	579	586	bone	143		205					4
2009.013	580	587	flaking debris	143		205					4
2009.013	581	588	bone	143		205					5
2009.013	582	589	flaking debris	143		205					5
2009.013	583	590	bone	143		205					6
2009.013	584	591	flaking debris	143		205					6
2009.013	585	592	bone	144		205					2
2009.013	586	593	bone	144		205					3
2009.013	587	594	flaking debris	145		204					7
2009.013	588	595	bone	145		205					7
2009.013	589	596	bone	145		205					8
2009.013	590	597	bone	145		204					7
2009.013	591	598	flaking debris	145		204					7
2009.013	592	599	bone	146		204					7
2009.013	593	600	bone	146		205					8
2009.013	594	601	flaking debris	146		205					8
2009.013	595	602	bone	147		205					7
2009.013	596	603	flaking debris	147		205					7

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
567	natural	150	158			datum	1/8	EMM	10/5/2006
568	arbitrary	108	135			datum	1/8	CEC	10/5/2006
569	arbitrary	150	160	157		datum	1/8	GW/CEC	10/4/2006
570	arbitrary	150	160			datum	1/8	GW/CEC	10/4/2006
571	arbitrary	160	170			datum	1/8	GW/EMM	10/5/2006
572	arbitrary	160	170			datum	1/8	GW/EMM	10/5/2006
573	arbitrary	150	160	162		datum	1/8	GW/CEC	10/4/2006
574	arbitrary	160	170	165		datum	1/8	GW/EMM	10/5/2006
575	arbitrary	160	170	165		datum	1/8	GW/EMM	10/5/2006
576	natural	170	192	171		datum	1/8	GW/EMM	10/5/2006
577	natural	170	183			datum	1/4	NIO/PBM	9/21/2006
578	natural	170	179	165		datum	1/8	GW/AM	9/26/2006
579	arbitrary	130	140			datum	1/4	MAC/JW	10/5/2006
580	arbitrary	130	140			datum	1/4	MAC/JW	10/5/2006
581	arbitrary	140	150			datum	1/4	MAC/JW	10/5/2006
582	arbitrary	140	150			datum	1/4	MAC/JW	10/5/2006
583	natural	150	159			datum	1/8	MAC/JW	10/5/2006
584	natural	150	159			datum	1/8	MAC/JW	10/5/2006
585	arbitrary	110	122			datum	1/4	MAC/JW	10/5/2006
586	arbitrary	122	130			datum	1/4	MAC/JW	10/5/2006
587	arbitrary	150	161			datum	1/8	EMM/CEC	9/26/2006
588	arbitrary	150	160			datum	1/4	SD/EMM	10/4/2006
589	arbitrary	160	170			datum	1/4	NIO/PBM	10/5/2006
590	arbitrary	150	161			datum	1/8	EMM/CEC	9/26/2006
591	arbitrary	150	161			datum	1/8	EMM/CEC	9/26/2006
592	arbitrary	150	163			datum	1/4	NIO/PBM	9/25/2006
593	arbitrary	150	161			datum	1/8	PBM/KJP	10/4/2006
594	arbitrary	150	161			datum	1/8	PBM/KJP	10/4/2006
595	arbitrary	150	161			datum	1/8	NIO/PBM	10/3/2006
596	arbitrary	150	161			datum	1/8	NIO/PBM	10/3/2006

Cat	Provenience Comments
567	dark soil present only in northeast corner, excavated to base of dark soil; base of excavation is about 50% yellow brown and dark soil; F18 is potential 3rd house feature or an occupied depression
568	scraping from south wall for profile
569	unit is mostly disturbed by rodents
570	unit is mostly disturbed by rodents
571	cultural fill slopes down to the north; unit continues to be heavily disturbed by rodents
572	cultural fill slopes down to the north; unit continues to be heavily disturbed by rodents
573	unit is mostly disturbed by rodents
574	cultural fill slopes down to the north; unit continues to be heavily disturbed by rodents
575	cultural fill slopes down to the north; unit continues to be heavily disturbed by rodents
576	F8 in north-central portion of unit; base of excavation at about 50% mottled yellow brown silty sand with dark brown/black sand
577	level almost entirely disturbed by rodents; base of excavation complete removal of intact dark soil to underlying yellow brown silty sand; one bucket soil screened through 1/8" mesh
578	base of excavation is about 50% mottling of dark soil with underlying yellow brown silty sand; some pockets of dark soil remain, likely rodent; F18 poss house or occupied depression
579	moderate rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
580	moderate rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
581	rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
582	rodent disturbance throughout level; one bucket soil screened through 1/8" mesh
583	level heavily disturbed by rodents; base of excavation is about 50% mottling of dark and lighter soils; F18 is possible house or an occupied depression
584	level heavily disturbed by rodents; base of excavation is about 50% mottling of dark and lighter soils; F18 is possible house or an occupied depression
585	heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
586	one bucket soil screened through 1/8" mesh; moderate disturbance by rodents
587	heavily disturbed by rodents, particularly in the southeast portion
588	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
589	one bucket soil screened through 1/8" mesh; moderate disturbance by rodents
590	heavily disturbed by rodents, particularly in the southeast portion
591	heavily disturbed by rodents, particularly in the southeast portion
592	one bucket soil screened through 1/8" mesh; dark soil remains in northeast corner, the southwest edge of F15, a small house; moderate rodent disturbance
593	mottling is about 50% dark and light soils, although this layer continues an additional 10-20 cm below this level
594	mottling is about 50% dark and light soils, although this layer continues an additional 10-20 cm below this level
595	
596	

Cat	Artifact Comments
567	
568	very fragile
569	
570	
571	
572	
573	refits w/cat.# 599
574	
575	
576	
577	
578	
579	very fragile
580	
581	
582	
583	
584	
585	
586	see also FS 531
587	rodent skull
588	
589	
590	
591	
592	
593	
594	west wall collapse
595	west wall collapse
596	

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	597	604	bone	148		205					6
2009.013	598	605	flaking debris	148		205					6
2009.013	599	606	flake tool	148		206					4
2009.013	600	607	bone	148		206					4
2009.013	601	608	flaking debris	148		206					4
2009.013	602	609	bone	148		206					3
2009.013	603	610	bone	149		206					4
2009.013	604	611	ground stone	148		206					4
2009.013	605	612	bone	145		206					2
2009.013	606	613	flaking debris	145		206					3
2009.013	607	614	bone	145		206					3
2009.013	608	615	bone	143		206					3
2009.013	609	616	bone	143		206					4
2009.013	610	618	bone	143		206					5
2009.013	611	619	flaking debris	143		206					5
2009.013	612	620	flaking debris	147		206					4
2009.013	613	621	bone	147		206					4
2009.013	614	622	flake tool	147		206					5
2009.013	615	623	bone	147		206					5
2009.013	616	624	bone	147		206					6
2009.013	617	625	flaking debris	146		206					2
2009.013	618	626	flaking debris	146		206					4
2009.013	619	627	bone	146		206					4
2009.013	620	628	flaking debris	146		206					5
2009.013	621	629	bone	146		206					5
2009.013	622	630	flaking debris	146		206					6
2009.013	623	631	bone	146		206					6
2009.013	624	632	bone	146		206					7
2009.013	625	633	flaking debris	146		206					7
2009.013	626	634	flaking debris	146		205					7
2009.013	627	635	bone	144		205					4
2009.013	628	636	bone	144		205					5
2009.013	629	637	flaking debris	144		205					6

5MF6255 Artifact Catalog

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
597	arbitrary	140	154			datum	1/8	NIO/PBM	9/26/2006
598	arbitrary	140	154			datum	1/8	NIO/PBM	9/26/2006
599	arbitrary	110	120			datum	1/4	HR/HD	10/5/2006
600	arbitrary	110	120			datum	1/4	HR/HD	10/5/2006
601	arbitrary	110	120			datum	1/4	HR/HD	10/5/2006
602	arbitrary	100	110			datum	1/4	HR/HD	10/5/2006
603	natural	120	124			datum	1/4	HR/HD	10/5/2006
604	arbitrary	110	120			datum	1/4	HR/HD	10/5/2006
605	arbitrary	100	110			datum	1/4	NIO/PBM	10/8/2006
606	arbitrary	110	120			datum	1/4	NIO/PBM	10/8/2006
607	arbitrary	110	120			datum	1/4	NIO/PBM	10/8/2006
608	arbitrary	120	130			datum	1/4	MAC/JW	10/8/2006
609	arbitrary	130	141			datum	1/4	MAC/JW	10/8/2006
610	arbitrary	141	150			datum	1/4	MAC/JW	10/8/2006
611	arbitrary	141	150			datum	1/4	MAC/JW	10/8/2006
612	arbitrary	110	120			datum	1/4	HR/HD	10/7/2006
613	arbitrary	110	120			datum	1/4	HR/HD	10/7/2006
614	arbitrary	120	130			datum	1/4	HR/HD	10/7/2006
615	arbitrary	120	130			datum	1/4	HR/HD	10/7/2006
616	arbitrary	130	140			datum	1/4	HR/HD	10/7/2006
617	arbitrary	90	100			datum	1/4	NIO/PBM	10/7/2006
618	arbitrary	110	120			datum	1/4	NIO/PBM	10/7/2006
619	arbitrary	110	120			datum	1/4	NIO/PBM	10/7/2006
620	arbitrary	120	130			datum	1/4	NIO/PBM	10/7/2006
621	arbitrary	120	130			datum	1/4	NIO/PBM	10/7/2006
622	arbitrary	130	140			datum	1/4	NIO/PBM	10/7/2006
623	arbitrary	130	140			datum	1/4	NIO/PBM	10/7/2006
624	arbitrary	140	148			datum	1/4	NIO/PBM	10/8/2006
625	arbitrary	140	148			datum	1/4	NIO/PBM	10/8/2006
626	arbitrary	140	150			datum	1/8	NIO/PBM	10/4/2006
627	arbitrary	130	140			datum	1/4	MAC/JW	10/7/2006
628	arbitrary	140	150			datum	1/4	MAC/JW	10/7/2006
629	arbitrary	150	160			datum	1/8	MAC/JW	10/7/2006

Cat	Provenience Comments
597	floor of unit is about 50% mottled of dark and light soils
598	floor of unit is about 50% mottled of dark and light soils
599	one bucket soil screened through 1/8" mesh
600	one bucket soil screened through 1/8" mesh
601	one bucket soil screened through 1/8" mesh
602	one bucket soil screened through 1/8" mesh
603	one bucket soil screened through 1/8" mesh; minimal rodent disturbance; base of excavation is complete removal of dark sand, hard to define and amorphous
604	one bucket soil screened through 1/8" mesh
605	charcoal flecking present; minimal rodent disturbance; one bucket soil screened through 1/8" mesh
606	moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
607	moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
608	
609	
610	most of level was disturbed by rodents, very little intact sediment remains
611	most of level was disturbed by rodents, very little intact sediment remains
612	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
613	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
614	one bucket soil screened through 1/8" mesh; minimal rodent disturbance; charcoal flecking present in east
615	one bucket soil screened through 1/8" mesh; minimal rodent disturbance; charcoal flecking present in east
616	one bucket soil screened through 1/8" mesh; dark soil remains only in western half of unit, eastern half is mottled yellow brown and dark sands
617	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
618	one bucket soil screened through 1/8" mesh
619	one bucket soil screened through 1/8" mesh
620	minimal rodent disturbance; charcoal flecking present; one bucket soil screened through 1/8" mesh
621	minimal rodent disturbance; charcoal flecking present; one bucket soil screened through 1/8" mesh
622	minimal rodent disturbance; one bucket screened through 1/8" mesh
623	minimal rodent disturbance; one bucket screened through 1/8" mesh
624	moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
625	moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
626	minimal rodent disturbance
627	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
628	minimal rodent disturbance; some charcoal flecking present; one bucket soil screened through 1/8" mesh
629	moderate rodent disturbance

Cat	Artifact Comments
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611	
612	
613	
614	
615	large long bone, poss tool?
616	
617	
618	point plot 1
619	
620	
621	
622	
623	
624	point plot 1
625	point plot 2
626	point plot 4
627	point plot 1
628	
629	

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	630	638	bone	144		205					6
2009.013	631	639	bone	144		206					3
2009.013	632	640	bone	144		206					4
2009.013	633	641	bone	142		205					
2009.013	634	642	flaking debris	142		205					
2009.013	635	643	bone	142		205					2
2009.013	636	644	ground stone	142	0.25	205	0.67				2
2009.013	637	645	bone	142		205					3
2009.013	638	646	flaking debris	142		205					3
2009.013	639	647	bone	142		205					4
2009.013	640	648	flaking debris	142		205					4
2009.013	641	649	bone	142		205					5
2009.013	642	650	flaking debris	142		205					5
2009.013	643	651	bone	142		205					6
2009.013	644	652	bone	142		203					7
2009.013	645	653	flaking debris	142		203					7
2009.013	646	654	bone					8	east		
2009.013	647	655	bone		142.63		203.67	8	east		
2009.013	648	656	bone	141		203					2
2009.013	649	657	bone	141		203					3
2009.013	650	658	flaking debris	141		203					3
2009.013	651	659	bone	141	0.35	203	0.15				3
2009.013	652	660	bone	141		203					4
2009.013	653	661	bone	141		203					4
2009.013	654	662	flaking debris	141		203					4
2009.013	655	663	ground stone	141	0.02	203	0.55				4
2009.013	656	664	bone	141		203					5

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
630	arbitrary	150	160			datum	1/8	MAC/JW	10/7/2006
631	arbitrary	110	123			datum	1/4	HR/HD	10/7/2006
632	arbitrary	123	130			datum	1/4	HR/HD	10/8/2006
633	arbitrary	120	162			datum	1/4	CEC/EMM	10/7/2006
634	arbitrary	120	162			datum	1/4	CEC/EMM	10/7/2006
635	arbitrary	110	121			datum	1/4	CEC/EMM	10/7/2006
636	arbitrary	110	121	118		datum	1/4	CEC/EMM	10/7/2006
637	arbitrary	121	130			datum	1/4	EMM	10/7/2006
638	arbitrary	121	130			datum	1/4	EMM	10/7/2006
639	arbitrary	130	140			datum	1/4	EMM/CEC	10/8/2006
640	arbitrary	130	140			datum	1/4	EMM/CEC	10/8/2006
641	arbitrary	140	150			datum	1/8	EMM/CEC	10/8/2006
642	arbitrary	140	150			datum	1/8	EMM/CEC	10/8/2006
643	natural	150	155			datum	1/8	EMM/CEC	10/8/2006
644	natural	170	192			datum	1/8	GW/EMM	10/5/2006
645	natural	170	192			datum	1/8	GW/EMM	10/5/2006
646	natural	177	210			datum	1/8	EMM	10/5/2006
647	natural	177	210	180		datum	1/8	EMM	10/5/2006
648	arbitrary	110	120			datum	1/4	GW/KJP	10/7/2006
649	arbitrary	120	131			datum	1/4	KJP	10/7/2006
650	arbitrary	120	131			datum	1/4	KJP	10/7/2006
651	arbitrary	120	131	131		datum	1/4	KJP	10/7/2006
652	arbitrary	131	140			datum	1/4	GW/KJP	10/7/2006
653	arbitrary	131	140			datum	1/4	GW/KJP	10/7/2006
654	arbitrary	131	140			datum	1/4	GW/KJP	10/7/2006
655	arbitrary	131	140	14		datum	1/4	GW/KJP	10/7/2006
656	arbitrary	140	150			datum	1/4	GW/KJP	10/7/2006

Cat	Provenience Comments
630	moderate rodent disturbance
631	heavy rodent disturbance; one bucket soil screened through 1/8" mesh
632	southwest corner entirely disturbed by rodents; one bucket soil screened through 1/8" mesh;
633	soil softened by rainstorms and watering caused the walls to easily collapse
634	soil softened by rainstorms and watering caused the walls to easily collapse
635	yellow brown soil not screened; one bucket of dark soil screened through 1/8" mesh; northwest wall collapsed; heavy rodent disturbance
636	yellow brown soil not screened; one bucket of dark soil screened through 1/8" mesh; northwest wall collapsed; heavy rodent disturbance
637	heavy disturbance by rodents; charcoal flecking present; one bucket soil screened through 1/8" mesh
638	heavy disturbance by rodents; charcoal flecking present; one bucket soil screened through 1/8" mesh
639	mostly disturbed by rodents; one bucket soil screened through 1/8" mesh
640	mostly disturbed by rodents; one bucket soil screened through 1/8" mesh
641	mostly disturbed by rodents; only small portion in north of unit remains of dark soil, rest is mottled yellow brown silty sand; F18 possible house or occupied depression
642	mostly disturbed by rodents; only small portion in north of unit remains of dark soil, rest is mottled yellow brown silty sand; F18 possible house or occupied depression
643	base of excavation is about 50% mottled yellow brown sand and dark soil; heavy disturbance by rodents; F18 is possible house or occupied depression
644	F8 in north-central portion of unit; base of excavation at about 50% mottled yellow brown silty sand with dark brown/black sand
645	F8 in north-central portion of unit; base of excavation at about 50% mottled yellow brown silty sand with dark brown/black sand
646	heavily disturbed by rodents, definition on north side is speculative; fill screened through 1/8" mesh; large, deep basin; interior feature of F18, poss house or occupied depression
647	heavily disturbed by rodents, definition on north side is speculative; fill screened through 1/8" mesh; large, deep basin; interior feature of F18, poss house or occupied depression
648	removed yellow brown without screening; screened one bucket of soil through 1/8" mesh; some rodent disturbance in south portion; north edge still heavily mottled with yellow brown sand
649	few gravels, rodent disturbance throughout; one bucket of soil screened through 1/8" mesh
650	few gravels, rodent disturbance throughout; one bucket of soil screened through 1/8" mesh
651	few gravels, rodent disturbance throughout; one bucket of soil screened through 1/8" mesh
652	heavy rodent disturbance throughout level; underlying yellow brown sand present in southwest corner; one bucket soil screened through 1/8" mesh
653	heavy rodent disturbance throughout level; underlying yellow brown sand present in southwest corner; one bucket soil screened through 1/8" mesh
654	heavy rodent disturbance throughout level; underlying yellow brown sand present in southwest corner; one bucket soil screened through 1/8" mesh
655	heavy rodent disturbance throughout level; underlying yellow brown sand present in southwest corner; one bucket soil screened through 1/8" mesh
656	encountered yellow brown sand subsoil in southern edge of unit; heavily disturbed by rodents in north; one bucket soil screened through 1/8" mesh

Cat	Artifact Comments
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636	point plot 1
637	point plot 2
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645	wall cleanup
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650	unit floor scraping
651	unit floor scraping
652	basin floor scraping
653	basin floor scraping
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5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	657	665	bone	141		203					6
2009.013	658	666	flaking debris	141		203					6
2009.013	659	667	bone	141	0.64	203	0.51				6
2009.013	660	668	bone	141	0.5	203	0.05				6
2009.013	661	669	bone	141	0.31	203	0.31				6
2009.013	662	670	ground stone	141	0.75	203	0.25				6
2009.013	663	671	flake tool		141.6		203.1	9			
2009.013	664	672	bone	141		204					2
2009.013	665	673	flaking debris	141		204					3
2009.013	666	674	bone	141		204					3
2009.013	667	675	bone	142		206					3
2009.013	668	676	flaking debris	142		206					2
2009.013	669	677	bone	142		206					2
2009.013	670	678	bone	143		206					6
2009.013	671	679	ground stone	141	0.73	204	0.1				4
2009.013	672	680	bone	141	0.64	204	0.9				4
2009.013	673	681	bone	144		206					5
2009.013	674	682	flaking debris	144		206					6
2009.013	675	683	bone	144		206					6
2009.013	676	684	bone	145		206					4
2009.013	677	685	flaking debris	145		206					4
2009.013	678	686	bone	145		206					5
2009.013	679	687	flaking debris	145		206					5
2009.013	680	688	flaking debris	145		206					6a
2009.013	681	689	bone	147		206					7
2009.013	682	690	flaking debris	147		206					8
2009.013	683	691	bone	147		206					8

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
657	natural	150	163			datum	1/8	SS/GW	10/8/2006
658	natural	150	163			datum	1/8	SS/GW	10/8/2006
659	natural	150	163	157		datum	1/8	SS/GW	10/8/2006
660	natural	150	163	153		datum	1/8	SS/GW	10/8/2006
661	natural	150	163	148		datum	1/8	SS/GW	10/8/2006
662	natural	150	163	155		datum	1/8	SS/GW	10/8/2006
663	natural	155	159	156		datum	1/8	GW	10/8/2006
664	arbitrary	110	120			datum	1/4	GW/EMM	10/8/2006
665	arbitrary	120	130			datum	1/4	GW/CEC/EMI	10/8/2006
666	arbitrary	120	130			datum	1/4	GW/CEC/EMI	10/8/2006
667	arbitrary	120	130			datum	1/4	JW/MAC	10/8/2006
668	arbitrary	110	120			datum	1/4	MAC/JW	10/8/2006
669	arbitrary	110	120			datum	1/4	MAC/JW	10/8/2006
670	natural	150	167			datum	1/8	MAC/JW	10/8/2006
671	arbitrary	130	140	137		datum	1/4	GW/CEC/EMI	10/8/2006
672	arbitrary	130	140	132		datum	1/4	GW/CEC/EMI	10/8/2006
673	arbitrary	130	140			datum	1/4	HR/HD	10/8/2006
674	arbitrary	140	150			datum	1/4	NIO/PBM	10/8/2006
675	arbitrary	140	150			datum	1/4	NIO/PBM	10/8/2006
676	arbitrary	120	130			datum	1/4	NIO/PBM	10/8/2006
677	arbitrary	120	130			datum	1/4	NIO/PBM	10/8/2006
678	arbitrary	130	140			datum	1/4	NIO/PBM	10/8/2006
679	arbitrary	130	140			datum	1/4	NIO/PBM	10/8/2006
680	arbitrary	140	144			datum	1/4	NIO/PBM	10/8/2006
681	arbitrary	140	150			datum	1/4	HR/HD	10/8/2006
682	arbitrary	150	160			datum	1/4	HR/HD	10/8/2006
683	arbitrary	150	160			datum	1/4	HR/HD	10/8/2006

Cat	Provenience Comments
657	base of excavation at about 50% mottled brown/black and yellow brown; F9 is a very shallow basin, poss. not a feature; also last level of F18, poss house or occupied depression; lots of rodent disturb
658	base of excavation at about 50% mottled brown/black and yellow brown; F9 is a very shallow basin, poss. not a feature; also last level of F18, poss house or occupied depression; lots of rodent disturb
659	base of excavation at about 50% mottled brown/black and yellow brown; F9 is a very shallow basin, poss. not a feature; also last level of F18, poss house or occupied depression; lots of rodent disturb
660	base of excavation at about 50% mottled brown/black and yellow brown; F9 is a very shallow basin, poss. not a feature; also last level of F18, poss house or occupied depression; lots of rodent disturb
661	base of excavation at about 50% mottled brown/black and yellow brown; F9 is a very shallow basin, poss. not a feature; also last level of F18, poss house or occupied depression; lots of rodent disturb
662	base of excavation at about 50% mottled brown/black and yellow brown; F9 is a very shallow basin, poss. not a feature; also last level of F18, poss house or occupied depression; lots of rodent disturb
663	large, shallow depression, poss not a cultural feature but a natural undulation; all fill collected; interior "feature" of F18, poss house or occupied depression
664	heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
665	rodent disturbance in western portion; mottled yellow brown sand in northeast corner; one bucket soil screened through 1/8" mesh
666	rodent disturbance in western portion; mottled yellow brown sand in northeast corner; one bucket soil screened through 1/8" mesh
667	heavy rodent disturbance; mottled yellow brown silty sand in north 1/2 of unit
668	some rodent disturbance
669	some rodent disturbance
670	level was mostly disturbed by rodents; base of excavation in intact areas is about 50% mottling of dark and light sands
671	heavily disturbed by rodents; charcoal flecks present; one bucket soil screened through 1/8" mesh
672	heavily disturbed by rodents; charcoal flecks present; one bucket soil screened through 1/8" mesh
673	mottling is about 50% dark and light soils; one bucket soil screened through 1/8" mesh; moderate rodent disturbance
674	mottling is about 50% dark and light soils; charcoal flecking present; minimal rodent disturbance; one bucket soil screened through 1/8" mesh
675	mottling is about 50% dark and light soils; charcoal flecking present; minimal rodent disturbance; one bucket soil screened through 1/8" mesh
676	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
677	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
678	one bucket soil screened through 1/8" mesh
679	one bucket soil screened through 1/8" mesh
680	one bucket soil screened through 1/8" mesh; partial level in east half
681	one bucket soil screened through 1/8" mesh
682	one bucket soil screened through 1/8" mesh; minimal rodent disturbance
683	one bucket soil screened through 1/8" mesh; minimal rodent disturbance

Cat	Artifact Comments
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666	point plot 2
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669	point plot 3
670	point plot 4
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672	
673	wall scraping
674	unit floor scraping
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5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	684	692	bone	141		203					6
2009.013	685	693	bone	141		201					2
2009.013	686	694	bone	141		202					5
2009.013	687	695	bone	142		204					8
2009.013	688	696	flaking debris					8	east		
2009.013	689	697	bone	148		206					5
2009.013	690	698	flaking debris	148		206					5
2009.013	691	699	bone	148	0.3	206	0.63				6
2009.013	692	700	bone	148		206					6
2009.013	693	701	bone	148		206					7
2009.013	694	702	flaking debris	141		205					2
2009.013	695	703	flaking debris	141		204					4
2009.013	696	704	bone	141		204					4
2009.013	697	705	bone	141		204					5
2009.013	698	706	flaking debris	141		204					5
2009.013	699	707	tested raw material	141	0.22	204	0.77				5
2009.013	700	708	bone	141	0.37	204	0.75				5
2009.013	701	709	flake tool	141	0.28	204	0.99				5
2009.013	702	710	bone	141		204					6
2009.013	703	711	flaking debris	141		204					6
2009.013	704	713	flaking debris	141		204					
2009.013	705	714	bone	141		202					5

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
684	natural	150	163			datum	1/8	SS/GW	10/8/2006
685	natural	130	139			datum	1/4	EMM/SD	10/3/2006
686	natural	150	158			datum	1/8	EMM	10/5/2006
687	natural	171	178			datum	1/8	GW/CEC	10/4/2006
688	natural	177	210			datum	1/8	EMM	10/5/2006
689	arbitrary	120	125			datum	1/4	HR/HD	10/5/2006
690	arbitrary	120	125			datum	1/4	HR/HD	10/5/2006
691	arbitrary	125	140	140		datum	1/8	JW/PBM	10/9/2006
692	arbitrary	125	140			datum	1/8	JW/PBM	10/9/2006
693	arbitrary	140	152			datum	1/8	PBM	10/10/2006
694	arbitrary	100	110			datum	1/4	GW/CEC	10/9/2006
695	arbitrary	130	140			datum	1/4	GW/CEC/EMI	10/8/2006
696	arbitrary	130	140			datum	1/4	GW/CEC/EMI	10/8/2006
697	arbitrary	140	150			datum	1/8	GW/CEC	10/9/2006
698	arbitrary	140	150			datum	1/8	GW/CEC	10/9/2006
699	arbitrary	140	150	147		datum	1/8	GW/CEC	10/9/2006
700	arbitrary	140	150	149		datum	1/8	GW/CEC	10/9/2006
701	arbitrary	140	150	145		datum	1/8	GW/CEC	10/9/2006
702	natural	150	162			datum	1/8	GW/CEC	10/9/2006
703	natural	150	162			datum	1/8	GW/CEC	10/9/2006
704	arbitrary	89	161			datum	1/4	CEC	10/9/2006
705	natural	150	158			datum	1/8	EMM	10/5/2006

Cat	Provenience Comments
684	base of excavation at about 50% mottled brown/black and yellow brown; F9 is a very shallow basin, poss. not a feature; also last level of F18, poss house or occupied depression; lots of rodent disturb
685	two buckets of soil screened through 1/8" mesh; dark soil fades throughout level to yellow brown sand
686	dark soil present only in northeast corner, excavated to base of dark soil; base of excavation is about 50% yellow brown and dark soil; F18 is potential 3rd house feature or an occupied depression
687	base of excavation at about 50% mottled yellow brown silty sand and dark soil; heavily disturbed by rodents; F18 is possible house or occupied depression
688	heavily disturbed by rodents, definition on north side is speculative; fill screened through 1/8" mesh; large, deep basin; interior feature of F18, poss house or occupied depression
689	one bucket soil screened through 1/8" mesh
690	one bucket soil screened through 1/8" mesh
691	slope in central-northeast portion of unit represents uphill wall of F15, a small house, which also exhibits some oxidation along the surface
692	slope in central-northeast portion of unit represents uphill wall of F15, a small house, which also exhibits some oxidation along the surface
693	oxidized area along slope near base of level; slope represents northeast curve of F15, a small house
694	some rodent disturbance; soil is compact with carbonates; one bucket soil screened through 1/8" mesh
695	heavily disturbed by rodents; charcoal flecks present; one bucket soil screened through 1/8" mesh
696	heavily disturbed by rodents; charcoal flecks present; one bucket soil screened through 1/8" mesh
697	level mostly rodent disturbance, very little natural soil remaining, charcoal flecking increases near interface with yellow brown subsoil where identifiable; F18 is poss house or occupied depression
698	level mostly rodent disturbance, very little natural soil remaining, charcoal flecking increases near interface with yellow brown subsoil where identifiable; F18 is poss house or occupied depression
699	level mostly rodent disturbance, very little natural soil remaining, charcoal flecking increases near interface with yellow brown subsoil where identifiable; F18 is poss house or occupied depression
700	level mostly rodent disturbance, very little natural soil remaining, charcoal flecking increases near interface with yellow brown subsoil where identifiable; F18 is poss house or occupied depression
701	level mostly rodent disturbance, very little natural soil remaining, charcoal flecking increases near interface with yellow brown subsoil where identifiable; F18 is poss house or occupied depression
702	F12,13,18 in unit; F18 poss house or occupied depression;some rodent disturbance in west and south; F13 mostly destroyed by rodents; base of excavation is about 50% mottling
703	F12,13,18 in unit; F18 poss house or occupied depression;some rodent disturbance in west and south; F13 mostly destroyed by rodents; base of excavation is about 50% mottling
704	wall scraping for profile
705	dark soil present only in northeast corner, excavated to base of dark soil; base of excavation is about 50% yellow brown and dark soil; F18 is potential 3rd house feature or an occupied depression

Cat	Artifact Comments
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693	point plot 1
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695	point plot 2
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700	see also FS 554 and 602
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5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	706	715	flaking debris	141		206					3
2009.013	707	716	bone	141		206					3
2009.013	708	717	flaking debris	141		206					4
2009.013	709	718	bone	141		205					3
2009.013	710	719	flaking debris	141		205					3
2009.013	711	720	flaking debris	141		205					4
2009.013	712	721	bone	141		205					4
2009.013	713	722	manuport	141	0.45	205	0.33				4
2009.013	714	723	bone	141		205					5
2009.013	715	724	flaking debris	141		205					5
2009.013	716	725	flaking debris	141		205					6
2009.013	717	726	bone	141		205					6
2009.013	718	727	manuport	141	0.45	205	0.15				6
2009.013	719	728	bone	146		206					8
2009.013	720	729	flaking debris	146		206					8
2009.013	721	730	bone	146		205					9
2009.013	722	731	bone	146	0.63	205	0.3				10
2009.013	723	732	bone	146		205					10
2009.013	724	733	flaking debris	146	0.89	205	0.52				10
2009.013	725	734	bone	147		206					9a
2009.013	726	735	flaking debris	147		204					7
2009.013	727	736	bone	147		204					7
2009.013	728	737	bone	147		204					8
2009.013	729	738	bone	147		205					7
2009.013	730	739	bone	147		205					8
2009.013	731	740	flaking debris	147		205					8
2009.013	732	741	bone	147		205					9

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
706	arbitrary	110	120			datum	1/4	GW	10/10/2006
707	arbitrary	110	120			datum	1/4	GW	10/10/2006
708	arbitrary	120	130			datum	1/4	GW	10/11/2006
709	arbitrary	110	120			datum	1/4	GW/CEC	10/10/2006
710	arbitrary	110	120			datum	1/4	GW/CEC	10/10/2006
711	arbitrary	120	130			datum	1/4	GW/CEC	10/10/2006
712	arbitrary	120	130			datum	1/4	GW/CEC	10/10/2006
713	arbitrary	120	130	132		datum	1/4	GW/CEC	10/10/2006
714	arbitrary	130	140			datum	1/8	GW/CEC	10/10/2006
715	arbitrary	130	140			datum	1/8	GW/CEC	10/10/2006
716	natural	140	168			datum	1/8	GW/CEC	10/10/2006
717	natural	140	168			datum	1/8	GW/CEC	10/10/2006
718	natural	140	168	142		datum	1/8	GW/CEC	10/10/2006
719	arbitrary	148	160			datum	1/8	SD/EMM	10/9/2006
720	arbitrary	148	160			datum	1/8	SD/EMM	10/9/2006
721	arbitrary	161	170			datum	1/8	SD/EMM	10/11/2006
722	arbitrary	170	174	173		datum	1/8	SD/EMM	10/11/2006
723	arbitrary	170	174			datum	1/8	SD/EMM	10/11/2006
724	arbitrary	170	174	176		datum	1/8	SD/EMM	10/11/2006
725	arbitrary	160	169			datum	1/8	EMM	10/12/2006
726	arbitrary	160	170			datum	1/8	PBM/JW	10/11/2006
727	arbitrary	160	170			datum	1/8	PBM/JW	10/11/2006
728	natural	170	176			datum	1/8	JW	10/11/2006
729	arbitrary	150	161			datum	1/8	NIO/PBM	10/3/2006
730	arbitrary	161	170			datum	1/8	NIO/PBM	10/10/2006
731	arbitrary	161	170			datum	1/8	NIO/PBM	10/10/2006
732	natural	170	177			datum	1/8	PBM/JW	10/10/2006

Cat	Provenience Comments
706	cultural soil mostly absent from this unit, represented by a light stain of brown/black sand mottled with yellow brown sandy clay; some rodent disturbance; 1 bucket 1/8" screened
707	cultural soil mostly absent from this unit, represented by a light stain of brown/black sand mottled with yellow brown sandy clay; some rodent disturbance; 1 bucket 1/8" screened
708	some rodent disturbance; one bucket soil screened through 1/8" mesh; cultural fill mostly absent from this unit
709	lots of rodent disturbance; one bucket soil screened through 1/8" mesh
710	lots of rodent disturbance; one bucket soil screened through 1/8" mesh
711	base of level in southeast is mottled yellow brown subsoil; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
712	base of level in southeast is mottled yellow brown subsoil; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
713	base of level in southeast is mottled yellow brown subsoil; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
714	F18 is possible house or occupied depression; rodent disturbance throughout
715	F18 is possible house or occupied depression; rodent disturbance throughout
716	remaining dark soil removed to base of excavation, about 50% mottled yellow brown sand and dark sand; some rodent disturbance; charcoal flecking present
717	remaining dark soil removed to base of excavation, about 50% mottled yellow brown sand and dark sand; some rodent disturbance; charcoal flecking present
718	remaining dark soil removed to base of excavation, about 50% mottled yellow brown sand and dark sand; some rodent disturbance; charcoal flecking present
719	near base of F15, small house; F10, circular pit, appears in northwest corner of unit
720	near base of F15, small house; F10, circular pit, appears in northwest corner of unit
721	southern portion of F15, small house; southwest 1/4 of F10, circular pit; dark soil (house fill) remains in the north portion of the unit
722	floor fill of F15, small house; F10 in northeast corner; charcoal flecks and chunks common
723	floor fill of F15, small house; F10 in northeast corner; charcoal flecks and chunks common
724	floor fill of F15, small house; F10 in northeast corner; charcoal flecks and chunks common
725	unit slopes sharply from east to west to floor of F15, small house; northeast quarter of F10, a large circular pit, is located in the southwest corner
726	near western center of F15, small house; charcoal flecking present
727	near western center of F15, small house; charcoal flecking present
728	floor of F15, small house; W 1/2 of F14, large circular pit; base of excavation about 50% mottled dark and light sands
729	
730	near floor of F15, small house; charcoal flecking present
731	near floor of F15, small house; charcoal flecking present
732	top of F14, large circular pit; northwest edge of F10, large circular pit; both are floor features of F15, small house; base of excavation about 50% mottled dark and light sands

Cat	Artifact Comments
706	
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708	unit floor scraping
709	unit floor scraping
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711	unit floor scraping
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718	
719	stain with ochre
720	basin floor clean up
721	basin floor clean up
722	
723	
724	
725	
726	
727	unit floor scraping
728	unit floor scraping
729	
730	
731	
732	from wall definition

5MF6255 Artifact Catalog

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	733	742	flaking debris	147		205					9
2009.013	734	743	bone	145		206					6b
2009.013	735	744	bone	145		206					7
2009.013	736	745	flaking debris	142		203					7
2009.013	737	746	flaking debris	144		204					6
2009.013	738	748	bone	148		206					7
2009.013	739	749	bone	143		202					7
2009.013	740	750	bone	140		202					2
2009.013	741	751	bone	147		205					8
2009.013	742	752	bone	147		206					9a
2009.013	743	753	flaking debris	147		206					9a
2009.013	744	754	bone	147		206					9b
2009.013	745	755	bone	147		204					8
2009.013	746	756	ground stone	147	0.39	204	0.31				8
2009.013	747	757	flaking debris	146		204					7
2009.013	748	758	bone	146		204					7
2009.013	749	759	flaking debris	146		204					8
2009.013	750	760	bone	146		204					8
2009.013	751	761	bone	146		206					9
2009.013	752	762	flaking debris	146		206					9
2009.013	753	763	bone	144		204					6
2009.013	754	764	flaking debris	144		204					6
2009.013	755	765	flaking debris	148		204					6

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
733	natural	170	177			datum	1/8	PBM/JW	10/10/2006
734	arbitrary	144	150			datum	1/8	SD/EMM	10/9/2006
735	arbitrary	150	160			datum	1/8	EMM/SD	10/8/2006
736	natural	170	192			datum	1/8	GW/EMM	10/5/2006
737	natural	150	163			datum	1/4	GW/SS	9/25/2006
738	arbitrary	140	152			datum	1/8	PBM	10/10/2006
739	natural	180	190			datum	1/4	CEC/NIO	9/19/2006
740	natural	120	131			datum	1/4	HR/CK	10/12/2006
741	arbitrary	161	170			datum	1/8	NIO/PBM	10/10/2006
742	arbitrary	160	169			datum	1/8	EMM	10/12/2006
743	arbitrary	160	169			datum	1/8	EMM	10/12/2006
744	natural	169	173			datum	1/8	EMM	10/12/2006
745	natural	170	176			datum	1/8	JW	10/11/2006
746	natural	170	176	175		datum	1/8	JW	10/11/2006
747	arbitrary	150	163			datum	1/4	NIO/PBM	9/25/2006
748	arbitrary	150	163			datum	1/4	NIO/PBM	9/25/2006
749	natural	163	177			datum	1/8	MDM/HR/CE(	10/11/2006
750	natural	163	177			datum	1/8	MDM/HR/CE(	10/11/2006
751	natural	160	173			datum	1/8	EMM/CK	10/12/2006
752	natural	160	173			datum	1/8	EMM/CK	10/12/2006
753	natural	150	163			datum	1/4	GW/SS	9/25/2006
754	natural	150	163			datum	1/4	GW/SS	9/25/2006
755	arbitrary	160	170			datum	1/8	CK	10/12/2006

Cat	Provenience Comments
733	top of F14, large circular pit; northwest edge of F10, large circular pit; both are floor features of F15, small house; base of excavation about 50% mottled dark and light sands
734	partial level, continued from previous; moderate rodent disturbance; base of level is within dark soil mottled with underlying light soil
735	numerous excavators over several days; base of level shows S edge of F15, small house; F11 poss post-hole; F16 E1/2 of heavily disturbed pit; heavy rodent disturbance
736	F8 in north-central portion of unit; base of excavation at about 50% mottled yellow brown silty sand with dark brown/black sand
737	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
738	oxidized area along slope near base of level; slope represents northeast curve of F15, a small house
739	base of excavation was remainder of dark soil to underlying yellow brown silty sand, some mottling present; dark soil mostly in rodent burrows; one bucket soil screened through 1/8" mesh
740	rock and black stain in southeast corner
741	near floor of F15, small house; charcoal flecking present
742	unit slopes sharply from east to west to floor of F15, small house; northeast quarter of F10, a large circular pit, is located in the southwest corner
743	unit slopes sharply from east to west to floor of F15, small house; northeast quarter of F10, a large circular pit, is located in the southwest corner
744	mottled soil removed to define edge of F15, small house; revealed oxidized soil along east wall; base of excavation about 50% mottled dark and light sands
745	floor of F15, small house; W 1/2 of F14, large circular pit; base of excavation about 50% mottled dark and light sands
746	floor of F15, small house; W 1/2 of F14, large circular pit; base of excavation about 50% mottled dark and light sands
747	one bucket soil screened through 1/8" mesh; dark soil remains in northeast corner, the southwest edge of F15, a small house; moderate rodent disturbance
748	one bucket soil screened through 1/8" mesh; dark soil remains in northeast corner, the southwest edge of F15, a small house; moderate rodent disturbance
749	base of excavation about 50% mottling of dark and lighter underlying soils; remaining dark soil is feature fill near floor of F15, a small house
750	base of excavation about 50% mottling of dark and lighter underlying soils; remaining dark soil is feature fill near floor of F15, a small house
751	base of excavation is about 50% mottled of dark and light soils, fairly uniform; floor of F15, small house; F10, circular pit, located in northwest corner
752	base of excavation is about 50% mottled of dark and light soils, fairly uniform; floor of F15, small house; F10, circular pit, located in northwest corner
753	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
754	base of excavation is about 50% mottled yellow brown silty sand with dark soil; heavily disturbed by rodents; one bucket soil screened through 1/8" mesh
755	represents northwest edge of F15, a small house; the circular area is not a feature, likely just an undulation in floor, or possibly rodent disturbance; charcoal flecking present

Cat	Artifact Comments
733	
734	
735	
736	from dark fill
737	
738	feature fill
739	feature fill
740	feature fill
741	
742	feature fill
743	feature fill
744	feature fill
745	
746	feature fill
747	
748	
749	
750	point plot 1
751	
752	unit floor scrape
753	unit floor scrape
754	
755	point plot 2

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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	756	766	bone	148		204					6
2009.013	757	767	bone	148		204					7
2009.013	758	768	bone	148		205					8b
2009.013	759	769	bone	148		205					8a
2009.013	760	770	bone	148	0.37	205	0.36				8a
2009.013	761	771	bone	148		205					8b
2009.013	762	772	bone	148		206					8
2009.013	763	773	flaking debris					10	south		
2009.013	764	774	bone					10	north		
2009.013	765	775	bone					10	north		
2009.013	766	776	manuport					10	north		
2009.013	767	777	flaking debris					13	south		
2009.013	768	778	bone					13	south		
2009.013	769	779	flaking debris					12	west		
2009.013	770	780	bone					12	west		
2009.013	771	781	bone	146	0.25	206	0.12				7
2009.013	772	782	flaking debris	140		203					2
2009.013	773	783	bone	140		203					3
2009.013	774	784	ground stone	140	0.67	203	0.05				3
2009.013	775	785	ground stone	140	0.9	203	0.45				4
2009.013	776	786	bone	144		205					7
2009.013	777	787	flaking debris	144		205					7
2009.013	778	788	flaking debris	145		205					8
2009.013	779	789	ground stone	140	0.76	203	0.84				4
2009.013	780	790	bone	145		206					7
2009.013	781	791	bone	145		206					7

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
756	arbitrary	160	170			datum	1/8	CK	10/12/2006
757	natural	170	173			datum	1/8	CK	10/12/2006
758	natural	163	174			datum	1/8	EMM	10/12/2006
759	arbitrary	161	163			datum	1/8	EMM	10/12/2006
760	arbitrary	161	163	159		datum	1/8	EMM	10/12/2006
761	natural	163	174			datum	1/8	EMM	10/12/2006
762	natural	152	169			datum	1/8	EMM	10/12/2006
763	natural	160	198			datum	1/8	SD/EMM	10/10/2006
764	natural	160	198			datum	1/8	SD/EMM	10/10/2006
765	natural	160	198			datum	1/8	SD/EMM	10/10/2006
766	natural	160	198			datum	1/8	SD/EMM	10/10/2006
767	natural	162	181			datum	1/8	CEC	10/11/2006
768	natural	162	181			datum	1/8	CEC	10/11/2006
769	natural	161	177			datum	1/8	CEC	10/11/2006
770	natural	161	177			datum	1/8	CEC	10/11/2006
771	arbitrary	140	148	144		datum	1/4	NIO/PBM	10/8/2006
772	arbitrary	100	110			datum	1/4	HR/MAC	10/13/2006
773	arbitrary	110	120			datum	1/4	HR/MAC	10/13/2006
774	arbitrary	110	120	119		datum	1/4	HR/MAC	10/13/2006
775	arbitrary	120	132	126		datum	1/4	HR/MAC	10/13/2006
776	natural	160	177			datum	1/4	EMM	10/13/2006
777	natural	160	177			datum	1/4	EMM	10/13/2006
778	arbitrary	160	170			datum	1/4	NIO/PBM	10/5/2006
779	arbitrary	120	132	125		datum	1/4	HR/MAC	10/13/2006
780	arbitrary	150	160			datum	1/8	EMM/SD	10/8/2006
781	arbitrary	150	160			datum	1/8	EMM/SD	10/8/2006

Cat	Provenience Comments
756	represents northwest edge of F15, a small house; the circular area is not a feature, likely just an undulation in floor, or possibly rodent disturbance; charcoal flecking present
757	charcoal flecking present; base of excavation about 50% mottled dark and light sands; northwest edge of floor of F15, a small house
758	base of excavation about 50% mottled dark and light sands; removal of remaining dark soil in south part represents floor of F15, a small house; wall slope is oxidized in areas
759	dark soil represents floor of F15, a small house, with sharp slope about midway in unit; edge of slope in east of unit is oxidized
760	dark soil represents floor of F15, a small house, with sharp slope about midway in unit; edge of slope in east of unit is oxidized
761	base of excavation about 50% mottled dark and light sands; removal of remaining dark soil in south part represents floor of F15, a small house; wall slope is oxidized in areas
762	removed soil from southwest corner to reveal floor of F15, a small house, and oxidized slope, represents northeast wall
763	large, deep basin; interior feature of F15, small house; 20L soil sample collected
764	fill screened through 1/8" mesh in field; large, deep basin; interior feature of F15, small house
765	fill screened through 1/8" mesh in field; large, deep basin; interior feature of F15, small house
766	fill screened through 1/8" mesh in field; large, deep basin; interior feature of F15, small house
767	fill screened through 1/8" mesh in field; large, deep basin; interior feature of F18, possible house or occupied depression
768	fill screened through 1/8" mesh in field; large, deep basin; interior feature of F18, possible house or occupied depression
769	large, deep basin; interior feature of F18, poss house or occupied depression; fill screened through 1/8" mesh in field
770	large, deep basin; interior feature of F18, poss house or occupied depression; fill screened through 1/8" mesh in field
771	moderately disturbed by rodents; one bucket soil screened through 1/8" mesh
772	
773	
774	
775	stopped at yellow brown silty sand subsoil, compact with carbonates, in southern 1/2 of unit; one bucket of soil screened through 1/8" mesh
776	base of excavation is about 50% mottling of dark and lighter soils; lots of insect casts, some rodent disturbance; two buckets soil screened through 1/8" mesh
777	base of excavation is about 50% mottling of dark and lighter soils; lots of insect casts, some rodent disturbance; two buckets soil screened through 1/8" mesh
778	one bucket soil screened through 1/8" mesh; moderate disturbance by rodents
779	stopped at yellow brown silty sand subsoil, compact with carbonates, in southern 1/2 of unit; one bucket of soil screened through 1/8" mesh
780	numerous excavators over several days; base of level shows S edge of F15, small house; F11 poss post-hole; F16 E1/2 of heavily disturbed pit; heavy rodent disturbance
781	numerous excavators over several days; base of level shows S edge of F15, small house; F11 poss post-hole; F16 E1/2 of heavily disturbed pit; heavy rodent disturbance

Cat	Artifact Comments
756	
757	from dark gray cultural soil
758	from mottled soil
759	
760	
761	
762	house wall scrape
763	unit floor scrape
764	unit floor scrape
765	
766	
767	
768	
769	
770	
771	
772	basin floor scrape
773	basin floor scrape
774	
775	
776	
777	
778	
779	
780	
781	

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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	782	792	flaking debris	145		206					7
2009.013	783	793	bone	146		206					9
2009.013	784	794	flaking debris	146		206					9
2009.013	785	795	bone	147		206					
2009.013	786	796	bone	147		206					9b
2009.013	787	797	flaking debris	147		206					9b
2009.013	788	798	bone					14	east		
2009.013	789	799	bone					14	east		
2009.013	790	800	flaking debris					14	west		
2009.013	791	801	bone					14	west		
2009.013	792	802	bone	140		203					4
2009.013	793	803	flaking debris	140		203					4
2009.013	794	804	flaking debris	147		206					
2009.013	795	805	bone	147		206					
2009.013	796	806	bone	146		205					11
2009.013	797	807	bone	145		204					8
2009.013	798	808	bone	145		205					9
2009.013	799	809	flaking debris	145		205					9
2009.013	800	810	bone	145		206					7
2009.013	801	811	flaking debris	145		206					7
2009.013	802	812	bone	145		206					8
2009.013	803	813	flaking debris	145		206					8
2009.013	804	814	bone	144		206					7
2009.013	805	815	bone	144		205					7
2009.013	806	816	flaking debris	144		205					7

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
782	arbitrary	150	160			datum	1/8	EMM/SD	10/8/2006
783	natural	160	173			datum	1/8	EMM/CK	10/12/2006
784	natural	160	173			datum	1/8	EMM/CK	10/12/2006
785	arbitrary	141	173			datum	1/8	EMM/CK	10/12/2006
786	natural	169	173			datum	1/8	EMM	10/12/2006
787	natural	169	173			datum	1/8	EMM	10/12/2006
788	natural	171	197			datum	1/8	PBM/JW/MDN	10/13/2006
789	natural	171	197			datum	1/8	PBM/JW/MDN	10/13/2006
790	natural	171	197			datum	1/8	EMM/CK	10/13/2006
791	natural	171	197			datum	1/8	EMM/CK	10/13/2006
792	arbitrary	120	132			datum	1/4	HR/MAC	10/13/2006
793	arbitrary	120	132			datum	1/4	HR/MAC	10/13/2006
794	arbitrary	173	173			datum	1/8	EMM/CK	10/13/2006
795	arbitrary	173	173			datum	1/8	EMM/CK	10/13/2006
796	natural	174	175			datum	1/8	MDM	10/22/2006
797	natural	161	164			datum	1/8	CEC/NIO/MDI	10/13/2006
798	natural	170	180			datum	1/4	NIO/CEC/MDI	10/13/2006
799	natural	170	180			datum	1/4	NIO/CEC/MDI	10/13/2006
800	arbitrary	150	160			datum	1/8	EMM/SD	10/8/2006
801	arbitrary	150	160			datum	1/8	EMM/SD	10/8/2006
802	natural	160	191			datum	1/8	NIO/CEC/MDI	10/13/2006
803	natural	160	191			datum	1/8	NIO/CEC/MDI	10/13/2006
804	arbitrary	150	161			datum	1/4	MDM/NIO	10/13/2006
805	natural	160	177			datum	1/4	EMM	10/13/2006
806	natural	160	177			datum	1/4	EMM	10/13/2006

Cat	Provenience Comments
782	numerous excavators over several days; base of level shows S edge of F15, small house; F11 poss post-hole; F16 E1/2 of heavily disturbed pit; heavy rodent disturbance
783	base of excavation is about 50% mottled of dark and light soils, fairly uniform; floor of F15, small house; F10, circular pit, located in northwest corner
784	base of excavation is about 50% mottled of dark and light soils, fairly uniform; floor of F15, small house; F10, circular pit, located in northwest corner
785	house wall scrape
786	mottled soil removed to define edge of F15, small house; revealed oxidized soil along east wall; base of excavation about 50% mottled dark and light sands
787	mottled soil removed to define edge of F15, small house; revealed oxidized soil along east wall; base of excavation about 50% mottled dark and light sands
788	10L fill collected; large, deep basin; interior feature of F15, small house
789	10L fill collected; large, deep basin; interior feature of F15, small house
790	fill screened in field; large, deep basin; interior feature of F15, small house
791	fill screened in field; large, deep basin; interior feature of F15, small house
792	stopped at yellow brown silty sand subsoil, compact with carbonates, in southern 1/2 of unit; one bucket of soil screened through 1/8" mesh
793	stopped at yellow brown silty sand subsoil, compact with carbonates, in southern 1/2 of unit; one bucket of soil screened through 1/8" mesh
794	house floor scrape
795	house floor scrape
796	scraped down to uniform mottling (about 50%), base of excavation, base of floor of F15
797	extreme western edge of F15, small house, along eastern edge; base of excavation is 50% mottled between dark and light sands
798	west half of F16, heavily rodent disturbed pit; southern edge of F15, small house; base of excavation about 50% mottled dark and light sands; dark soil screened through 1/8", rest 1/4"
799	west half of F16, heavily rodent disturbed pit; southern edge of F15, small house; base of excavation about 50% mottled dark and light sands; dark soil screened through 1/8", rest 1/4"
800	numerous excavators over several days; base of level shows S edge of F15, small house; F11 poss post-hole; F16 E1/2 of heavily disturbed pit; heavy rodent disturbance
801	numerous excavators over several days; base of level shows S edge of F15, small house; F11 poss post-hole; F16 E1/2 of heavily disturbed pit; heavy rodent disturbance
802	E1/2 of F16, heavily disturbed pit; southern edge of F15, small house; base of excavation is about 50% mottling of darker and lighter sands
803	E1/2 of F16, heavily disturbed pit; southern edge of F15, small house; base of excavation is about 50% mottling of darker and lighter sands
804	minimal rodent disturbance; discrepancy in depths from previous level due to erosion from heavy rains; mottling about 50% dark and light soils
805	base of excavation is about 50% mottling of dark and lighter soils; lots of insect casts, some rodent disturbance; two buckets soil screened through 1/8" mesh
806	base of excavation is about 50% mottling of dark and lighter soils; lots of insect casts, some rodent disturbance; two buckets soil screened through 1/8" mesh

Cat	Artifact Comments
782	clean up around poss feature
783	clean up around poss feature
784	
785	
786	
787	from dark soil in NE corner
788	
789	
790	
791	
792	
793	
794	
795	one large bone
796	
797	
798	
799	
800	
801	
802	
803	
804	
805	
806	wall collapse

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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	807	817	bone	144		205					7
2009.013	808	818	flaking debris	147		207					1
2009.013	809	819	flaking debris	147		207					2
2009.013	810	820	bone	140		203					5
2009.013	811	821	bone	140		204					2
2009.013	812	822	bone	140		204					3
2009.013	813	823	flaking debris	140		204					3
2009.013	814	824	bone	140		204					4
2009.013	815	825	ground stone	140	0.87	204	0.88				4
2009.013	816	826	bone	140		204					5
2009.013	817	827	flaking debris	145		207					2
2009.013	818	828	bone	145		207					2
2009.013	819	829	bone	145		207					3
2009.013	820	830	flaking debris	145		207					4
2009.013	821	831	bone	145		207					4
2009.013	822	832	bone	145		207					5
2009.013	823	833	flaking debris	145		207					5
2009.013	824	834	bone	140		205					
2009.013	825	835	bone	140		204					5
2009.013	826	836	bone	140		202					2
2009.013	827	837	manuport	140	0.77	205	0.79				2
2009.013	828	838	bone	140		205					2
2009.013	829	839	flaking debris	140		205					3
2009.013	830	840	bone	140		205					3
2009.013	831	841	flaking debris	144		207					2
2009.013	832	842	bone	144		207					3
2009.013	833	843	flaking debris	144		207					3
2009.013	834	844	flaking debris	144		207					4
2009.013	835	845	bone	144		207					4

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
807	natural	160	177			datum	1/4	EMM	10/13/2006
808	arbitrary	82	90			datum	1/4	SS/PBM	10/18/2006
809	arbitrary	90	100			datum	1/4	SS/PBM	10/18/2006
810	natural	132	138			datum	1/8	HR/MAC/NIO	10/13/2006
811	arbitrary	103	110			datum	1/4	HR/NIO	10/16/2006
812	arbitrary	110	120			datum	1/4	HR/NIO	10/18/2006
813	arbitrary	110	120			datum	1/4	HR/NIO	10/18/2006
814	arbitrary	120	130			datum	1/4	HR/NIO	10/18/2006
815	arbitrary	120	130	129		datum	1/4	HR/NIO	10/18/2006
816	natural	130	140			datum	1/4	HR/NIO	10/18/2006
817	arbitrary	89	100			datum	1/4	HR/NIO	10/19/2006
818	arbitrary	89	100			datum	1/4	HR/NIO	10/19/2006
819	arbitrary	100	110			datum	1/4	HR/NIO	10/19/2006
820	arbitrary	110	120			datum	1/4	HR/NIO	10/19/2006
821	arbitrary	110	120			datum	1/4	HR/NIO	10/19/2006
822	arbitrary	120	130			datum	1/4	HR/NIO	10/19/2006
823	arbitrary	120	130			datum	1/4	HR/NIO	10/19/2006
824	arbitrary	110	130			datum	1/8	HR/NIO	10/19/2006
825	natural	130	140			datum	1/4	HR/NIO	10/18/2006
826	natural	120	131			datum	1/4	HR/CK	10/12/2006
827	arbitrary	97	100	98		datum	1/4	HR/NIO	10/18/2006
828	arbitrary	97	100			datum	1/4	HR/NIO	10/18/2006
829	arbitrary	100	110			datum	1/4	HR/NIO	10/18/2006
830	arbitrary	100	110			datum	1/4	HR/NIO	10/18/2006
831	arbitrary	97	100			datum	1/4	NIO/HR	10/19/2006
832	arbitrary	100	110			datum	1/4	NIO/HR	10/19/2006
833	arbitrary	100	110			datum	1/4	NIO/HR	10/19/2006
834	arbitrary	110	121			datum	1/4	NIO/HR	10/19/2006
835	arbitrary	110	121			datum	1/4	NIO/HR	10/19/2006

Cat	Provenience Comments
807	base of excavation is about 50% mottling of dark and lighter soils; lots of insect casts, some rodent disturbance; two buckets soil screened through 1/8" mesh
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809	rodent disturbance in northeast corner; one bucket soil screened through 1/8" mesh; charcoal flecking present
810	remainder of dark brown/black soil removed to top of light brown sand; about 50% mottled with dark soil as base of excavation
811	reached bottom of gray brown soil in southeast corner; one bucket of soil screened through 1/8" mesh
812	dark brown soil remains in the northern 1/3 of the unit; underlying sediment is yellow brown fine-grained sand, moderately compact; one bucket soil screened through 1/8" mesh
813	dark brown soil remains in the northern 1/3 of the unit; underlying sediment is yellow brown fine-grained sand, moderately compact; one bucket soil screened through 1/8" mesh
814	dark cultural soil remains only in strip in north of unit; one bucket soil screened through 1/8" mesh
815	dark cultural soil remains only in strip in north of unit; one bucket soil screened through 1/8" mesh
816	remaining dark soil removed to yellow brown sand, about 50% mottled with dark soil as base of excavation; one bucket soil screened through 1/8" mesh
817	moderate rodent disturbance throughout level; one bucket screened through 1/8" mesh
818	moderate rodent disturbance throughout level; one bucket screened through 1/8" mesh
819	one bucket soil screened through 1/8" mesh
820	transitions to yellow brown sand; one bucket soil screened through 1/8" mesh
821	transitions to yellow brown sand; one bucket soil screened through 1/8" mesh
822	one bucket soil screened through 1/8" mesh; mottling is about 50%, but profile shows dark cultural fill below; charcoal flecking present
823	one bucket soil screened through 1/8" mesh; mottling is about 50%, but profile shows dark cultural fill below; charcoal flecking present
824	wall collapse from levels 3 and 4
825	remaining dark soil removed to yellow brown sand, about 50% mottled with dark soil as base of excavation; one bucket soil screened through 1/8" mesh
826	rock and black stain in southeast corner
827	one bucket soil screended through 1/8" mesh
828	one bucket soil screended through 1/8" mesh
829	dark soil removed to top of light yellow brown silty sand, moderately compact; one bucket soil screened through 1/8" mesh
830	dark soil removed to top of light yellow brown silty sand, moderately compact; one bucket soil screened through 1/8" mesh
831	minimal rodent disturbance; one bucket soil screened through 1/8" mesh
832	moderate rodent disturbance; one bucket soil screened through 1/8" mesh
833	moderate rodent disturbance; one bucket soil screened through 1/8" mesh
834	one bucket soil screened through 1/8" mesh
835	one bucket soil screened through 1/8" mesh

Cat	Artifact Comments
807	unit floor scrape
808	unit floor scrape
809	point plot 1
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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	836	846	bone	144		207					5
2009.013	837	847	flaking debris	144		207					5
2009.013	838	848	bone	144		207					6
2009.013	839	849	flaking debris	146		207					1
2009.013	840	850	ground stone	146	0.47	207	0.73				2
2009.013	841	851	bone	146		207					3
2009.013	842	852	bone	146		207					4
2009.013	843	853	flaking debris	146		207					4
2009.013	844	854	flaking debris	146		207					5
2009.013	845	855	bone	146		207					5
2009.013	846	856	bone	146		207					6
2009.013	847	857	flaking debris	144		207					6
2009.013	848	858	flaking debris	145		207					6
2009.013	849	859	flaking debris	146		207					2
2009.013	850	860	bone	146		207					2
2009.013	851	861	bone	147		207					3
2009.013	852	862	flaking debris	147		207					3
2009.013	853	863	bone	147		207					4
2009.013	854	864	flaking debris	147		207					4
2009.013	855	865	bone	147		207					5
2009.013	856	866	flake tool	147		207					6
2009.013	857	867	flaking debris	147		207					6
2009.013	858	868	bone	147		207					7
2009.013	859	869	flaking debris	147		207					7
2009.013	860	870	biface	147	0.14	207					7
2009.013	861	871	flaking debris	146	0.06	206	0.96				9
2009.013	862	872	bone	146		207					7
2009.013	863	873	bone	145		207					7
2009.013	864	874	flaking debris	145		207					7
2009.013	865	875	bone	144		205					7
2009.013	866	876	bone	144		206					8
2009.013	867	877	flaking debris	144		206					8
2009.013	868	878	ground stone	144		206					9

Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
836	arbitrary	121	130			datum	1/4	NIO/HR	10/20/2006
837	arbitrary	121	130			datum	1/4	NIO/HR	10/20/2006
838	arbitrary	130	141			datum	1/4	NIO/HR	10/20/2006
839	arbitrary	82	90			datum	1/4	PBM/CEC	10/19/2006
840	arbitrary	90	100	102		datum	1/4	PBM/CEC	10/19/2006
841	arbitrary	100	110		0	datum	1/4	PBM/CEC	10/19/2006
842	arbitrary	110	120			datum	1/4	PBM/CEC	10/19/2006
843	arbitrary	110	120			datum	1/4	PBM/CEC	10/19/2006
844	arbitrary	120	130			datum	1/4	PBM/CEC	10/19/2006
845	arbitrary	120	130			datum	1/4	PBM/CEC	10/19/2006
846	arbitrary	130	140			datum	1/4	PBM/CEC	10/19/2006
847	arbitrary	130	141			datum	1/4	NIO/HR	10/20/2006
848	arbitrary	130	140			datum	1/4	HR/NIO	10/19/2006
849	arbitrary	90	100			datum	1/4	PBM/CEC	10/19/2006
850	arbitrary	90	100			datum	1/4	PBM/CEC	10/19/2006
851	arbitrary	100	110			datum	1/4	CEC/PBM	10/18/2006
852	arbitrary	100	110			datum	1/4	CEC/PBM	10/18/2006
853	arbitrary	110	120			datum	1/4	CEC/PBM	10/18/2006
854	arbitrary	110	120			datum	1/4	CEC/PBM	10/18/2006
855	arbitrary	120	130			datum	1/4	CEC/PBM	10/18/2006
856	arbitrary	130	140			datum	1/8	CEC/PBM	10/19/2006
857	arbitrary	130	140			datum	1/8	CEC/PBM	10/19/2006
858	natural	140	151			datum	1/8	CEC/PBM	10/19/2006
859	natural	140	151			datum	1/8	CEC/PBM	10/19/2006
860	natural	140	151	164		datum	1/8	CEC/PBM	10/19/2006
861	natural	160	173	170		datum	1/8	EMM/CK	10/12/2006
862	natural	140	150			datum	1/8	PBM/CEC	10/19/2006
863	natural	140	161			datum	1/4	CEC/PBM/MD	10/20/2006
864	natural	140	161			datum	1/4	CEC/PBM/MD	10/20/2006
865	natural	160	177			datum	1/4	EMM	10/13/2006
866	arbitrary	161	170			datum	1/4	NIO/PBM	10/23/2006
867	arbitrary	161	170			datum	1/4	NIO/PBM	10/23/2006
868	natural	170	180			datum	1/4	NIO/PBM	10/23/2006

Cat	Provenience Comments
836	charcoal flecking present; mottling is about 50% darker and lighter soils; one bucket soil screened through 1/8" mesh
837	charcoal flecking present; mottling is about 50% darker and lighter soils; one bucket soil screened through 1/8" mesh
838	moderately disturbed by rodents; charcoal flecking present; one bucket soil screened through 1/8" mesh
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840	one bucket soil screened through 1/8" mesh
841	one bucket soil screened through 1/8" mesh
842	one bucket soil screened through 1/8" mesh
843	one bucket soil screened through 1/8" mesh
844	dark soil remains in south and western portion of unit; northeast is mottled yellow brown and dark soil; one bucket soil screened through 1/8" mesh
845	dark soil remains in south and western portion of unit; northeast is mottled yellow brown and dark soil; one bucket soil screened through 1/8" mesh
846	dark soil slopes down to the southwest, where it remains in unit; one bucket soil screened through 1/8" mesh
847	moderately disturbed by rodents; charcoal flecking present; one bucket soil screened through 1/8" mesh
848	darker, more cohesive soil in northwest corner; minimal rodent disturbance; one bucket soil screened through 1/8" mesh
849	one bucket soil screened through 1/8" mesh
850	one bucket soil screened through 1/8" mesh
851	one bucket soil screened through 1/8" mesh; rodent disturbance in northeast corner
852	one bucket soil screened through 1/8" mesh; rodent disturbance in northeast corner
853	one bucket soil screened through 1/8" mesh
854	one bucket soil screened through 1/8" mesh
855	slope from east to west is sharp, representing the uphill wall of F15, a small house; one bucket soil screened through 1/8" mesh
856	remaining dark sand still in southwest corner of unit
857	remaining dark sand still in southwest corner of unit
858	base of excavation is about 50% mottled dark and light sands; extreme eastern edge of F15, small house
859	base of excavation is about 50% mottled dark and light sands; extreme eastern edge of F15, small house
860	base of excavation is about 50% mottled dark and light sands; extreme eastern edge of F15, small house
861	base of excavation is about 50% mottled of dark and light soils, fairly uniform; floor of F15, small house; F10, circular pit, located in northwest corner
862	base of excavation about 50% mottled dark and light soils
863	base of excavation is about 50% mottling dark and light soils; floor slopes down to the southwest
864	base of excavation is about 50% mottling dark and light soils; floor slopes down to the southwest
865	base of excavation is about 50% mottling of dark and lighter soils; lots of insect casts, some rodent disturbance; two buckets soil screened through 1/8" mesh
866	charcoal flecking present; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
867	charcoal flecking present; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
868	one bucket soil screened through 1/8" mesh; base of excavation is about 50% mottling of dark and lighter soils

Cat	Artifact Comments
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847	
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850	
851	unit floor scrape
852	
853	
854	
855	west wall clean up
856	
857	west wall collapse; NOT BONE, DISCARDED 02/26/09 JBL
858	
859	
860	
861	
862	poss sling shot
863	
864	
865	
866	unit floor scrape
867	
868	

Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	869	879	bone	144		207					
2009.013	870	880	bone	144		207					
2009.013	871	881	flaking debris	144		207					7
2009.013	872	882	bone	144		207					7
2009.013	873	883	bone	144		207					8
2009.013	874	884	flaking debris	144		207					8
2009.013	875	885	manuport	144		207					8
2009.013	876	886	ground stone	146	0.16	200	0.48				8
2009.013	877	887	flaking debris					16			
2009.013	878	888	bone					16			
2009.013	879	889	bone	144		206					9
2009.013	880	890	bone	144		206					9
2009.013	881	891	flake tool	141		205					4
2009.013	882	892	flake tool	142		202					5
2009.013	883	893	flaking debris					2	east		
2009.013	884	894	flaking debris					3	east		
2009.013	885	895	flaking debris					8	west		
2009.013	886	896	flaking debris					12	east		
2009.013	887	897	flaking debris					13	north		
2009.013	888	898	flaking debris					14	west		
2009.013	889	899	ground stone	143	0.28	200	0.48				5
2009.013	890	900	other artifact	149		200					2
2009.013	891	901	other artifact	149		200					2
2009.013	892	902	other artifact	149		200					2
2009.013	893	903	bone					9			
2009.013	894	904	bone					13	north		
2009.013	895	905	bone					12	east		
2009.013	896	906	bone					8	west		
2009.013	897	907	bone					16			
2009.013	898	908	bone	145		206					8
2009.013	899	909	bone					4	west		

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
869	arbitrary	150	165			datum	1/8	NIO/CEC	10/23/2006
870	arbitrary	150	165			datum	1/8	NIO/CEC	10/23/2006
871	arbitrary	141	150			datum	1/4	NIO/HR	10/23/2006
872	arbitrary	141	150			datum	1/4	NIO/HR	10/23/2006
873	natural	150	165			datum	1/4	NIO/MDM/CE	10/23/2006
874	natural	150	165			datum	1/4	NIO/MDM/CE	10/23/2006
875	natural	150	165			datum	1/4	NIO/MDM/CE	10/23/2006
876	natural	190	194	19		datum	1/8	SS	9/19/2006
877	natural	161	187				1/8	MDM	10/24/2006
878	natural	161	187				1/8	MDM	10/24/2006
879	natural	170	180			datum	1/4	NIO/PBM	10/23/2006
880	natural	170	180			datum	1/4	NIO/PBM	10/23/2006
881	arbitrary	120	130			datum	1/4	GW/CEC	10/10/2006
882	arbitrary	160	170			datum	1/8	EMM	10/3/2006
883	natural	200	207			datum	1/8	GW	9/20/2006
884	natural	197	225			datum	1/8	GW/CEC	8/25/2006
885	natural	177	210			datum	1/8	EMM	10/5/2006
886	natural	161	177			datum	1/8	CEC	10/11/2006
887	natural	162	181			datum	1/8	CEC	10/11/2006
888	natural	171	197			datum	1/8	EMM/CK	10/13/2006
889	arbitrary	170	180	177		datum	1/4	GW/CEC	8/28/2006
890	arbitrary	130	140			datum	1/4	EMM	8/27/2006
891	arbitrary	130	140			datum	1/4	EMM	8/27/2006
892	arbitrary	130	140			datum	1/4	EMM	8/27/2006
893	natural	155	159			datum	1/8	GW	10/8/2006
894	natural	162	181			datum	1/8	CEC	10/11/2006
895	natural	161	177			datum	1/8	CEC	10/11/2006
896	natural	177	210			datum	1/8	EMM	10/5/2006
897	natural	161	187				1/8	MDM	10/24/2006
898	natural	160	191			datum	1/8	NIO/CEC/MDI	10/13/2006
899	natural	190	214			datum	1/8	GW/CEC	8/25/2006

Cat	Provenience Comments
869	west wall cleanup
870	west wall cleanup
871	one bucket soil screened through 1/8" mesh
872	one bucket soil screened through 1/8" mesh
873	moderate disturbance by rodents; base of excavation is about 50% mottling of lighter and darker soils, slightly more lighter soil
874	moderate disturbance by rodents; base of excavation is about 50% mottling of lighter and darker soils, slightly more lighter soil
875	moderate disturbance by rodents; base of excavation is about 50% mottling of lighter and darker soils, slightly more lighter soil
876	base of excavation is about 50% mottled dark and light soils; F2 completely removed in level, F4 still visible at base; F17 is small house
877	irregular basin mostly destroyed by rodents; prob was circular basin; 10L soil sample collected, rest screened in field
878	irregular basin mostly destroyed by rodents; prob was circular basin; 10L soil sample collected, rest screened in field
879	one bucket soil screened through 1/8" mesh; base of excavation is about 50% mottling of dark and lighter soils
880	one bucket soil screened through 1/8" mesh; base of excavation is about 50% mottling of dark and lighter soils
881	base of level in southeast is mottled yellow brown subsoil; moderate rodent disturbance; one bucket soil screened through 1/8" mesh
882	cultural fill remains in north end of unit; heavily disturbed by rodents; F18 is possible house or occupied depression
883	fill screened through 1/8" mesh; large shallow basin; interior feature of F17, small house
884	feature truncated by pipeline trench; all fill collected; interior feature of F17, small house
885	10L soil sample collected, rest screened in field; large, deep basin; heavily disturbed by rodents; interior feature of F18, poss house or occupied depression
886	large, deep basin; interior feature of F18, poss house or occupied depression; 10L soil sample collected
887	10L fill collected; large, deep basin; interior feature of F18, poss house or occupied depression
888	fill screened in field; large, deep basin; interior feature of F15, small house
889	heavily disturbed by rodents; yellow brown sand throughout most of unit; one bucket soil screened through 1/8" mesh
890	soil was screened after recovery of large, round, suspicious rock; unknown if it is cultural or natural
891	soil was screened after recovery of large, round, suspicious rock; unknown if it is cultural or natural
892	soil was screened after recovery of large, round, suspicious rock; unknown if it is cultural or natural
893	large, shallow depression, poss not a cultural feature but a natural undulation; all fill collected; interior "feature" of F18, poss house or occupied depression
894	10L fill collected; large, deep basin; interior feature of F18, poss house or occupied depression
895	large, deep basin; interior feature of F18, poss house or occupied depression; 10L soil sample collected
896	10L soil sample collected, rest screened in field; large, deep basin; heavily disturbed by rodents; interior feature of F18, poss house or occupied depression
897	irregular basin mostly destroyed by rodents; prob was circular basin; 10L soil sample collected, rest screened in field
898	E1/2 of F16, heavily disturbed pit; southern edge of F15, small house; base of excavation is about 50% mottling of darker and lighter sands
899	large, deep basin; interior feature of F17, small house; 10L of fill collected for flotation

Cat	Artifact Comments
869	
870	
871	
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873	
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875	
876	
877	
878	
879	round rock
880	round rock
881	round rock
882	heavy fraction
883	heavy fraction
884	heavy fraction
885	heavy fraction
886	heavy fraction
887	heavy fraction, SE corner of unit
888	heavy fraction, W 1/2
889	
890	
891	bulk soil, W 1/2
892	heavy fraction
893	bulk soil
894	heavy fraction
895	heavy fraction, S 1/2
896	heavy fraction, S 1/2
897	heavy fraction
898	heavy fraction
899	heavy fraction, W 1/2

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Accession No.	Cat	FS	Artifact type	Grid north	North plot	Grid east	East plot	Feature	Feature part	Feature level	Level
2009.013	900	910	bone					4	west		
2009.013	901	911	bone					3	east		
2009.013	902	912	bone					3	east		
2009.013	903	913	bone					11			
2009.013	904	914	bone					10	south		
2009.013	905	915	bone					10	south		
2009.013	906	916	bone					6			
2009.013	907	917	bone					7			
2009.013	908	918	bone					2	west		
2009.013	909	919	bone					2	east		
2009.013	910	920	bone					14	west		
2009.013	911	921	bone					14	east		
2009.013	912	922	bone					1	north		
2009.013	913	923	bone	148		206					7
2009.013	914	365	ground stone	143	0.12	203	0.43				7
2009.013	915	496	ground stone	142	0	201	0.96				1
2009.013	916	543	ground stone	142	0.24	202	0.64				4
2009.013	917	562	ground stone	141	0.82	202	0.25				2
2009.013	918	924	manuport	143	0.1	205	0.3				3
2009.013	922	925	other artifact	142		201					3

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Cat	Level type	Depth NW top	Depth NW bottom	Depth plot	Datum	Depth below	Screen	Initials	Date
900	natural	190	214			datum	1/8	GW/CEC	8/25/2006
901	natural	197	225			datum	1/8	GW/CEC	8/25/2006
902	natural	197	225			datum	1/8	GW/CEC	8/25/2006
903	natural	160	172			datum	1/8	EMM/SD	10/11/2007
904	natural	160	198			datum	1/8	SD/EMM	10/10/2006
905	natural	160	198			datum	1/8	SD/EMM	10/10/2006
906	natural	190	204			datum	1/8	NIO/JW	8/26/2006
907	natural	199	213			datum	1/8	NIO/JW	8/27/2006
908	natural	200	207			datum	1/8	GW/CEC	9/20/2006
909	natural	200	207			datum	1/8	GW	9/20/2006
910	natural	171	197			datum	1/8	EMM/CK	10/13/2006
911	natural	171	197			datum	1/8	PBM/JW/MDN	10/13/2006
912	natural	195	206			datum	1/8	GW/CEC	8/27/2006
913	arbitrary	140	152			datum	1/8	PBM	10/10/2006
914	natural	170	183	182		datum	1/4	NIO/PBM	9/21/2006
915	arbitrary	122	140	134		datum	1/4	SS	9/25/2006
916	arbitrary	150	160	158		datum	1/4	EMM/AM	9/27/2006
917	arbitrary	120	130	130		datum	1/4	EMM/SD	10/4/2006
918	arbitrary	120	130	133		datum	1/4	KJP/PBM	10/4/2006
922	natural	150	160			datum	1/4	CEC/EMM	9/26/2006

Cat	Provenience Comments
900	large, deep basin; interior feature of F17, small house; 10L of fill collected for flotation
901	feature truncated by pipeline trench; all fill collected; interior feature of F17, small house
902	feature truncated by pipeline trench; all fill collected; interior feature of F17, small house
903	all fill collected; oval basin, possibly not a feature; interior feature of F15, small house; poss post hole(s)
904	large, deep basin; interior feature of F15, small house; 20L soil sample collected
905	large, deep basin; interior feature of F15, small house; 20L soil sample collected
906	circular stain with straight sides and flat bottom; fill collected; interior feature of F17, small house; poss post hole, located near northwest "wall" of house
907	small circular basin feature; fill collected; interior feature of F17, small house; poss post hole, located near northwest "wall" of house
908	all fill collected; charcoal date returned 7190 +/- 50 BP; large, shallow basin; interior basin of F17, small house
909	fill screened through 1/8" mesh; large shallow basin; interior feature of F17, small house
910	fill screened in field; large, deep basin; interior feature of F15, small house
911	10L fill collected; large, deep basin; interior feature of F15, small house
912	all fill collected; possible post mold; interior feature of F17, small house, near north edge
913	oxidized area along slope near base of level; slope represents northeast curve of F15, a small house
914	level almost entirely disturbed by rodents; base of excavation complete removal of intact dark soil to underlying yellow brown silty sand; one bucket soil screened through 1/8" mesh
915	some rodent disturbance
916	dark soil slopes to NE; heavy rodent disturbance; one bucket soil screened through 1/8" mesh
917	lighter yellow brown sand in south; one bucket soil screened through 1/8" mesh
918	moderate rodent disturbance throughout level; one bucket soil screened through 1/8" mesh, taken from black soil in southwest corner
922	heavy rodent disturbance; cultural fill thin in this unit, mostly in north 1/2; base of excavation in north is about 50% mottled yellow brown silty sand and dark soil; one bucket 1/8" screened

Cat	Artifact Comments
900	heavy fraction, E 1/2
901	
902	W 1/2
903	heavy fraction, E 1/2
904	heavy fraction
905	heavy fraction
906	PP 1; refits with FS 230
907	refits with FS 230; extended into 142N/202E, 141N/201E, & 141N/202E
908	PP 3; refits with FS 230
909	refits with FS 230
910	originally lipid sample 62
911	wall cleanup for profile
912	burnt clay
913	from wall cleanup for profile
914	
915	
916	
917	
918	
922	