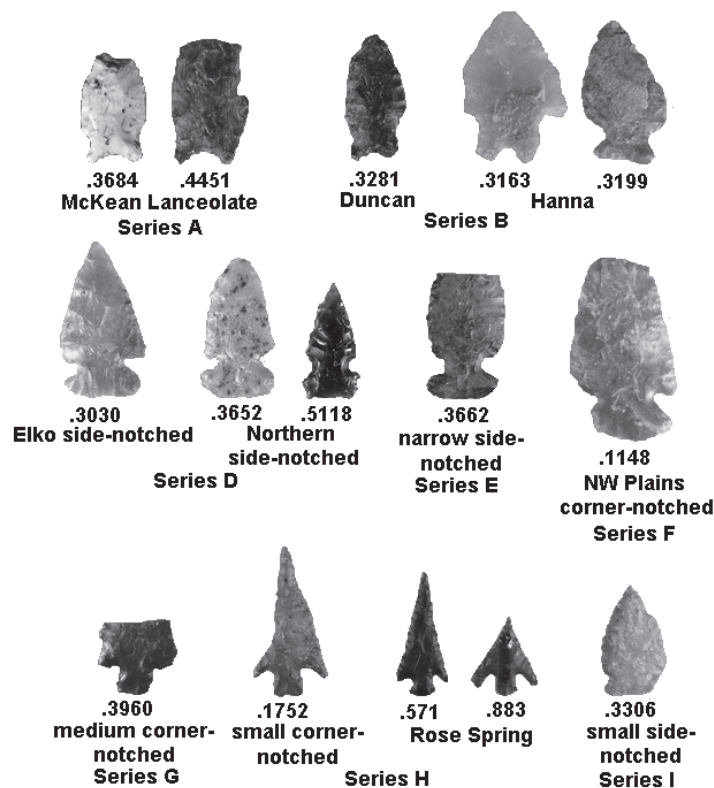


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On the Cover:

Projectile Points from the Bathtub Site. See article by Nelson, this issue.

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IN MEMORIUM

BEVERLY JEANNE “BJ” EARLE July 16, 1947 ~ March 12, 2019



Beverly Jeanne “BJ” Earle, of Livingston, Montana, passed away suddenly during a heart valve replacement surgery on Tuesday, March 12th, 2019, at the Billings Clinic Hospital.

Born July 16th, 1947 in Eugene, Oregon to Eugene Earle and Mary (Crane) Earle, BJ grew up in Oregon, Ohio, and Baltimore. Her father was a civil engineer and the family traveled wherever work took them, eventually that travel was around the world.

BJ attended Dulaney High School in Timonium, Maryland, graduating in the class of 1965. Following graduation, she attended Brigham Young University in Provo, Utah and majored in Archeology. During college summers, BJ worked in Yellowstone National Park and developed a lifelong love of the park

After her graduation from BYU, BJ joined the Bureau of Land Management and served in Dillon and Miles City, MT, and Buffalo, WY. Her work included surveying and recording prehistoric and historic sites and complexes, especially in hard rock mining areas. She worked on the bureau’s coal leasing program, and from 1986-2010 lived and worked in Buffalo, Wyoming in the Hole-in-the-Wall (Johnson County War) area. She provided input for oil and gas development, and coal, sand, and gravel sales. She loved the work and was hoping to finish her career with the Park Service but health issues precluded that dream’s fruition.

BJ was an incredibly talented artist and, following retirement, she was drawn to Livingston by the town’s vibrant art scene. She joined Toastmasters, drew from the model with a group of like-minded artists on Wednesday nights, and in 2018, participated in “Plein Aire on the Yellowstone” through the Living-

ton Center for Art and Culture. She maintained her professional interests by participating in local historic and archeological society meetings. She was a member of the Museum of the Rockies. It was her pleasure to volunteer for Livingston’s Yellowstone’s Gateway Museum.

In the last four years, she was able to renew her old love of Egyptian archeology by studying hieroglyphics and traveling to Egypt where her mother worked for the American International School of Cairo in the 1980s. She was deeply interested in new developments at the classic sites in Cairo, Luxor, and the Valley of the Kings. In early 2018, she travelled to Europe to visit Egyptian collections at Berlin’s Pergamon Museum, the Louvre in Paris, and the British Museum.

BJ is survived by her sister, Susan Vera Earle of Baltimore, MD; her brother, William Michael Earle, and sister-in-law, Susan Leonard Earle, of Beaver, PA; a half-sister, Monique Toussaint of Malmedy, Belgium; three half-brothers, Eugene Earle Jr., Edward Earle, Ernest Earle, all of the Philippines; four nephews, Jason, Jonathan, Benjamin, and Brian Earle; cousins, Howard Hoy of Altoona IA, Jacqueline Hoy of Humboldt NB, and Robin Latham of Boise IA.

Memorials are preferred in BJ’s memory to the Yellowstone Gateway Museum, 118 West Chinook Street; Livingston, MT 59047.

From: https://www.franzen-davis.com/notices/Beverly-BJEarle?fbclid=IwAR3gOoIzSCpVxHhz6MlxPLwqIA--5SSvb_Z_59UPpVUJwk0GHlh_xYTBdU

A SUMMARY OF EXCAVATION RESULTS AT FOUR SITES IN NORTHERN CONVERSE COUNTY, WYOMING

by
GENE MUNSON

ABSTRACT

Excavation results of four sites located in the eastern portion of the Powder River Basin with multicomponent occupations ranging from Paleoindian through Late Prehistoric II occupations are presented. The sites showed a heavy reliance on locally available quartzite, chert and silicified wood cobble sources for lithic tools. One obsidian flake was the only clearly imported lithic. A wide variety of prey species was used for food. The Late Prehistoric I was the only component found at all four sites, suggesting the highest population in the eastern Powder River Basin was during this period of time.

INTRODUCTION

This article uses a slightly modified version of the cultural chronology for the Northwestern Plains developed by Frison (1978; 1991). The refinement focuses on the last 2,000 years of prehistory which includes the transition from the Late Plains Archaic period to the Late Prehistoric period and divides the Late Prehistoric period into the Late Prehistoric I period and the Late Prehistoric II period. The Late Plains Archaic is from 1000 B.C. to A.D. 300, the Late Prehistoric I is from A.D. 200 to A.D. 1200, and the Late Prehistoric II is from A.D. 1200 to A.D. 1750. Frison begins the Late Prehistoric period around A.D. 500 and shows no changes

or divisions until historic times. Based on the results of excavation and analysis of over 75 sites in the eastern and northwestern Powder River Basin, there are some significant variations in the material culture, settlement patterns and associated radiocarbon dates, and this revised chronology is more appropriate. It should be noted there is at least a 100-year overlap between the Late Plains Archaic and the Late Prehistoric I periods.

Within the Late Prehistoric I is a local cultural manifestation labeled as the Thunder Basin phase. The Thunder Basin phase is recognized by a composite of cultural remains, some of which are unique and some of which are not unique. The cultural remains include small-diameter cylindrical pit hearths/ovens, clay-filled pits, fired clay objects including heads from zoomorphs, a basket hopper mortar, gaming pieces made of both stone and shell, a heavy reliance on locally available tabular quartzite cobbles for tools, a variety of projectile point styles including both dart-size and arrow-size corner-notched and side-notched, and a heavy reliance on intermediate- and small-size mammals for food. This variation really stands out when compared with the Late Prehistoric I occupations in the Montana portion of the Powder River Basin. The term *phase* as used here attempts to follow the definition as set out by Willey and Phillips (1958). This is not to be con-

fused with the common usage of the term by researchers in the Northwestern Plains; for example, Besant phase or Pelican Lake phase. These phases are based on projectile point styles. The Thunder Basin phase is not a *projectile point culture*. It has a limited geographical extent and interval of time. Willey and Phillips define *phase* as:

. . . an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time (1958:22).

Following Willey and Phillips (1958:23), it is not necessary to know the cultural continuity of a phase. It is not known at this time what came before and what came after the Thunder Basin phase.

SPRING RINGS SITE

Spring Rings (48CO2720) (Figure 1) is a sprawling Late Plains Archaic period and Late Prehistoric I period campsite containing 21 stone rings and associated lithic scatter distributed along the crest of a north-to-south-trending low ridge dividing two unnamed north-to-south-trending intermittent drainages (Munson 2011a) (Figure 2). The site continues south of where the two ephemeral drainages merge and onto an eroding terrace. The site measures 550 m north to south by 100 m east to west, with an area of about 50,000 square meters. The unnamed north-to-south-trending drainages are tributaries of Spring Creek, itself a tributary of Antelope Creek. Marsh grasses in the drainages at the site suggest water is near the surface on a regular basis. The general setting is an eroding low ridge within rolling grassland. Vegetation includes sparse prairie grasses, prickly pear (*Opuntia polyacantha*) and sagebrush

(*Artemisia tridentata*), except on the terrace portion of the site. Here, there are areas with dense vegetation of prairie grasses and sagebrush.

Eleven block excavations and four test units were dug. All of the block excavations and test units were placed at magnetic field gradient anomalies. A total of 327.25 square meters was excavated, including 315.25 square meters of block excavations, 3.5 square meters at eroded and exposed hearths, and 8.5 square meters of testing.

Based on radiocarbon ¹⁴C dates, the site was occupied intermittently from around 900 B.C. to around A.D. 980.

Twenty-seven thermal features and three stone rings were excavated. None of the thermal features were inside the rings. Three were near the stone rings, and the rest on the face of the low ridge on which the stone rings are located and on the stream terrace. All of the features except one were pit hearths. The feature which was not a pit hearth may have been the remains of a surface hearth or the eroded bottom of a pit hearth.

Forty-one stone tools, four fired clay objects and one .32-40 cartridge were collected from the site. Three of the stone tools were collected from the surface and outside the excavations. The rest came from the block excavations. The stone tools included one probable atlatl weight, one Late Plains Archaic corner-notched (Pelican Lake) dart point, one Late Plains Archaic Yonkee dart point, one Late Prehistoric I arrow point, one point fragment, four bifaces, 13 cobble tools, one drill, two endscrapers, five mano fragments, two metate fragments, one bifacially modified flake and nine unifacially modified flakes.

One of the fired clay objects may have been the nose from a zoomorph figurine. Another fired clay object is different from the several dozen fired clay objects recovered from the local Thunder Basin phase sites. It is triangular in cross-section and tapered prism

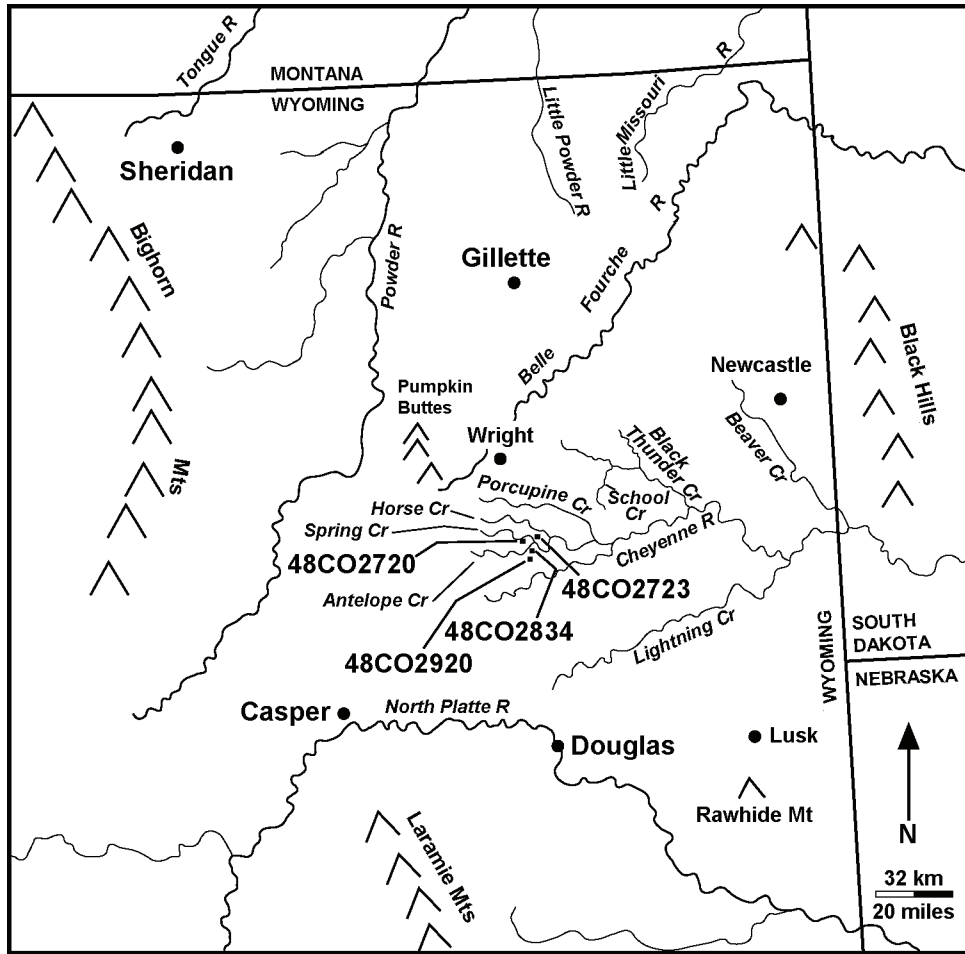


Figure 1: Map showing locations of 48CO2720, 48CO2723, 48CO2834 and 48CO2920 in north-east Wyoming.

shape in three-dimension. The remaining two fired clay objects are too small to determine whether they were part of a figurine.

Three hundred and thirteen pieces of lithic debitage were recovered from the block excavations. Three pieces of lithic debitage were recovered from test units outside of the block excavations.

The faunal assemblage from Spring Rings site contained 434 bone specimens. Specimens identified to species included bison, pronghorn, jackrabbit, prairie dog, ground squirrel and deer mouse. In addition, bone could only be identified to size of mammal included large mammal, large to medium mammal, medium mammal, medium to intermediate mammal, intermediate mammal,

small mammal and unidentified animal.

There were three episodes of occupation at the site. Episode I took place around 900 B.C. Episode II took place from around A.D. 120 to around A.D. 400, and Episode III took place from around A.D. 660 to around A.D. 980. One block excavation has a radiocarbon date associated with Episode I. Eight block excavations have radiocarbon dates associated with Episode II, and nine block excavations have radiocarbon dates associated with Episode III. Not all thermal features could be assigned to a particular episode because of the absence of radiocarbon dates. Likewise, not all artifacts could be assigned because of the lack of context.

The Episode I occupation, circa 900 B.C.,

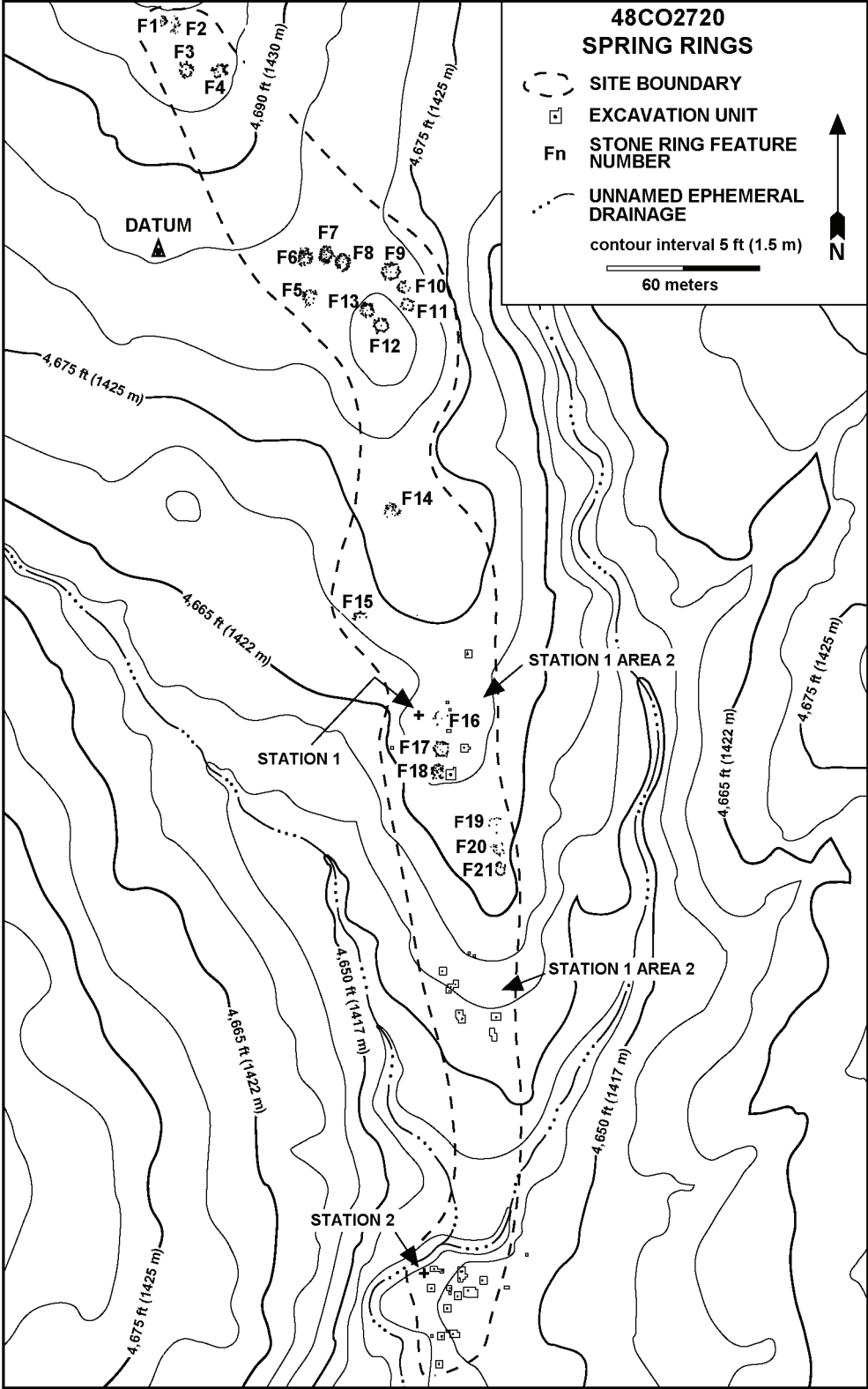


Figure 2: Site map of Spring Rings site, 48CO2720.

of the site provided little information because of the limited amount of artifacts which could be definitely associated with the radiocarbon-dated hearth Feature S1-A1-B1-F1. One unifacially modified flake knife and five flakes were the only artifacts found in the block excavation where Feature S1-A1-B1-F1 was located. The location of the feature adjacent to stone ring Feature 18 suggests at least one of the stone rings at the site dates to this occupation. The hearth had a large rock-filled basin, the largest-diameter pit excavated at the site.

Episode II occupation occurred during the transition from the Late Plains Archaic period to the Late Prehistoric I period. Eight excavation blocks contained hearths dating to this transition period. None of the three hearths excavated in the stone ring portion of the site had radiocarbon dates during this period of time. However, it seems reasonable the occupants of the site added or at least re-used the stone rings from the circa 900 B.C. occupation. The Late Plains Archaic corner-notched point recovered from the surface of the site likely was associated with Episode II. The Yonkee point recovered from Block S2-B3 is problematic, since the hearth in this block dates to around A.D. 250. This seems late for this style of point and may have been brought to the site as a curio. The small and delicate arrow point recovered from Block S1-A2-B1 suggests this style of point was used locally by A.D. 400.

The hearths associated with Episode II had a variety of pit shapes including barrel shaped, bowl shaped, cylinder shaped, and atypical (in part cylinder and in part more or less basin). The two barrel-shaped hearths had radiocarbon dates of around A.D. 400. The atypical hearth also dated to this time. One bowl-shaped pit hearth dated to around A.D. 250, and one dated to around A.D. 350. The cylindrical pit hearths dated from around A.D. 120 to around A.D. 250.

The 20 tools associated with Episode II

included one probable atlatl weight, two cobble chopper/scrapers, one cobble graver, two cobble hammers, one cobble scraper/graver, one endscraper, one ground cobble/mano, four mano fragments, one metate fragment, one Late Plains Archaic Yonkee projectile point, one Late Plains Archaic Pelican Lake projectile point, one Late Prehistoric I arrow point, one possible unifacially modified flake drill stem and two unifacially modified flake knives.

The eight Episode II block excavations contained only 171 pieces of lithic debitage. Chert was the most common lithic material. The lithic debitage included 107 chert, 41 quartzite, 13 dark maroon quartzite commonly called *ironstone*, six porcellanite, two chalcedony, one crystal quartz and one Tongue River silicified sediment. The nearby ridges would have provided sufficient quality gravels for most of the lithic manufacturing.

Three hundred and thirty-six bone specimens were recovered from the blocks associated with Episode II. Bone identified to species included one prairie dog (*Cynomys* sp.) specimen, 27 jackrabbit (*Lepus* sp.) specimens and one ground squirrel (*Urocitellus* sp.) specimen. The prairie dog and ground squirrel specimens were not burned. Several of the jackrabbit specimens were burned, so there is suggestion jackrabbit was included in the inhabitants' diet. Thirty-five of the 122 specimens identified as intermediate mammal were jackrabbit size and probably are jackrabbit. Some of these specimens were burned. Most of the remaining 87 specimens were small burned fragments and may be jackrabbit, prairie dog or ground squirrel. Four bison-size limb bone fragments were recovered. There were 12 large to medium mammal specimens. Almost all of the 89 medium mammal bone specimens were pronghorn size and probably were pronghorn. There were 52 medium to intermediate mammal bone fragments. None of the 26 small

mammal bones were burned and they probably are from natural occurrences. They are microtine rodent size. Two limb bone fragments could not be identified as to animal.

The Episode III occupation took place in the Late Prehistoric I period from around A.D. 660 to around A.D. 980. Nine excavation blocks contained hearths dating to the Episode III occupation. In the stone ring portion of the site, two of the blocks had hearths with radiocarbon dates to this episode of occupation at around A.D. 880. The presence of these hearths adds support at least some of the stone rings are associated with Episode III.

Eight of the 13 Episode III hearth features had cylindrical pits. One hearth pit was a partial barrel and partial cylinder. The barrel-shaped portion of the pit probably was the result of the wall slumping. These features are considered to represent the Thunder Basin phase occupation(s) of the site. Since one of the features is located where the stone rings are, it is assumed at least some of the rings are associated with the Thunder Basin phase occupation.

Three hearths had basin-shaped pits. One of these hearths was located adjacent to two Thunder Basin phase cylindrical pit hearth features. Additional support this feature was associated with the Thunder Basin phase was provided by the recovery of an interior fragment from a probable fired clay object. This combination of cylindrical pit hearths and hearths with basin-shaped pits adds to our understanding of the Thunder Basin phase and suggests these two types of hearths represent different activities within the group or household. Unfortunately, the paucity of artifacts did not shed light on what the different activities may have been.

One hearth had a pit which was a combination of basin shaped and bowl shaped. The portion of the pit considered to be basin shaped lacks oxidized soil and the wall

of the pit was difficult to discern. The top of the feature was only 2 cmbs, and it is extremely likely the upper portion of the pit was removed by erosion. It is probable the pit was originally cylinder shaped and only the bottom of the pit was present.

Eighteen stone tools were associated with Episode III. They were two stage II bifaces, one bifacially modified flake knife, two cobble knives, three cobble scrapers, two cobble scrapers/gravers, one drill, one metate fragment, one point fragment, one unifacially modified flake knife and four unifacially modified flake scrapers.

There was not a lot of overlap in the types of tools between Episodes II and III. Both episodes shared only cobble scrapers/gravers, metate fragments and unifacially modified flake knives. Of the tools shared by both episodes, the cobble scraper/graver was the most interesting. This is a unique tool, and why appears during both episodes of occupation is not known.

The nine Episode III block excavations contained only 78 pieces of lithic debitage. Ironstone was the most common lithic material. Lithic debitage consisted of 36 ironstone, ten chert, ten quartzite, 17 porcellanite, four silicified wood and one Tongue River silicified sediment.

Four fired clay objects, typical of the Thunder Basin phase, were recovered from the site. They are associated with Episode III. One was a tapered cylindrical object split lengthwise. The object was formed around two rods (likely twigs). One rod was 1.9 mm in diameter and not enough of the second rod impression remains for measurement. The object probably was the nose from a zoomorph figurine. The second fired clay object was triangular in cross-section and tapered prism shape in three-dimension. It was split lengthwise. The base of the object was formed around a 6.8 mm diameter rod. Both ends of the object are intact. The

rough appearance of the object suggests the clay was fairly dry when it was shaped and fired. This gives the object a crude appearance. The third fired clay object was a small nondescript fragment. The fourth was a small interior fragment from what was likely a fired clay object. It was from the portion of the object where clay was molded around a rod. Rod diameter was around 3.2 mm.

Episode III bone specimens included one jackrabbit (*Lepus* sp.), one ground squirrel (*Uroditellus* sp.), one pronghorn (*Antilocapra americana*), five medium mammal, 14 intermediate mammal and 28 small mammal.

As it typical of stone ring sites, stone rings and the immediate area around them have a paucity or absence of hearths and artifacts. This raises the question: How could they be associated with camping and not have an abundance of artifacts and thermal features? As was demonstrated at stone ring site Porcupine Rings (48CA960) (Munson et al. 1999) and adjacent campsite Bony Bison (48CA2631) (Munson and Ferguson 1999a), and again at the Spring Rings site, the sphere of activity included hearths and associated artifact producing tasks extends well beyond the stone rings. The stone rings are but one component of these complex sites. Finding the locations where these tasks were carried out is a matter of chance which includes erosion, exposing the task areas and conducting magnetometer surveys in the correct locations. At both Porcupine Rings and Spring Rings, the task areas were off the ridge tops and extended onto stream terraces where there is soil deposition.

The stone rings at the Spring Rings site were in four clusters with two outlier stone rings. It is likely individual stone rings were added, removed or modified during the occupations over a span of 1,600 years. How they were rearranged into groups through this period of time will never be known. What we are left with is how they are currently grouped. If

the current grouping of rings was made during one stay at the site, it appears four bands gathered at Spring Rings site. Such a gathering could have been for a rendezvous and celebration.

SPRING TERRACE SITE

Spring Terrace site (48CO2723) is a Late Plains Archaic period, Late Prehistoric I period and Late Prehistoric II period campsite located on the nearly level T1 (first) terrace on the south side of Spring Creek, an intermittent stream (Munson and Johnson 2011). Spring Creek flows into Antelope Creek about 5 km southeast of the site. The site measures about 75 m east to west by 20 m north to south and covers an area of about 1,500 square meters (Figure 3).

Vegetation encompasses a relatively heavy growth of invasive cheat grass (*Bromus tectorum*), as well as native prairie grasses including needle-and-thread (*Stipa comata*), prairie Junegrass (*Koeleria macrantha*) and bluebunch wheatgrass (*Pseudoroegneria spicata*). Plains prickly pear cactus (*Opuntia polyacantha*) is abundant. A few plains cottonwood trees (*Populus deltoides*) are growing along the Spring Creek drainage. Marsh grasses are abundant in the Spring Creek drainage bottom.

Eighty-four square meters were excavated at 48CO2723. This included 75 square meters of block excavations and nine square meters of testing. Three block excavations were dug at the site.

Eight thermal features were excavated. Three of the features were surface hearths; three were pit hearths and two were considered pit ovens since the pit walls showed no fire-caused soil oxidization.

Forty-eight stone tools and one bone tool were collected from the site. Tools included three stone awls, one bone awl, five bifaces, five modified tabular cobbles, two mano fragments, 18 unifacially modified flakes,

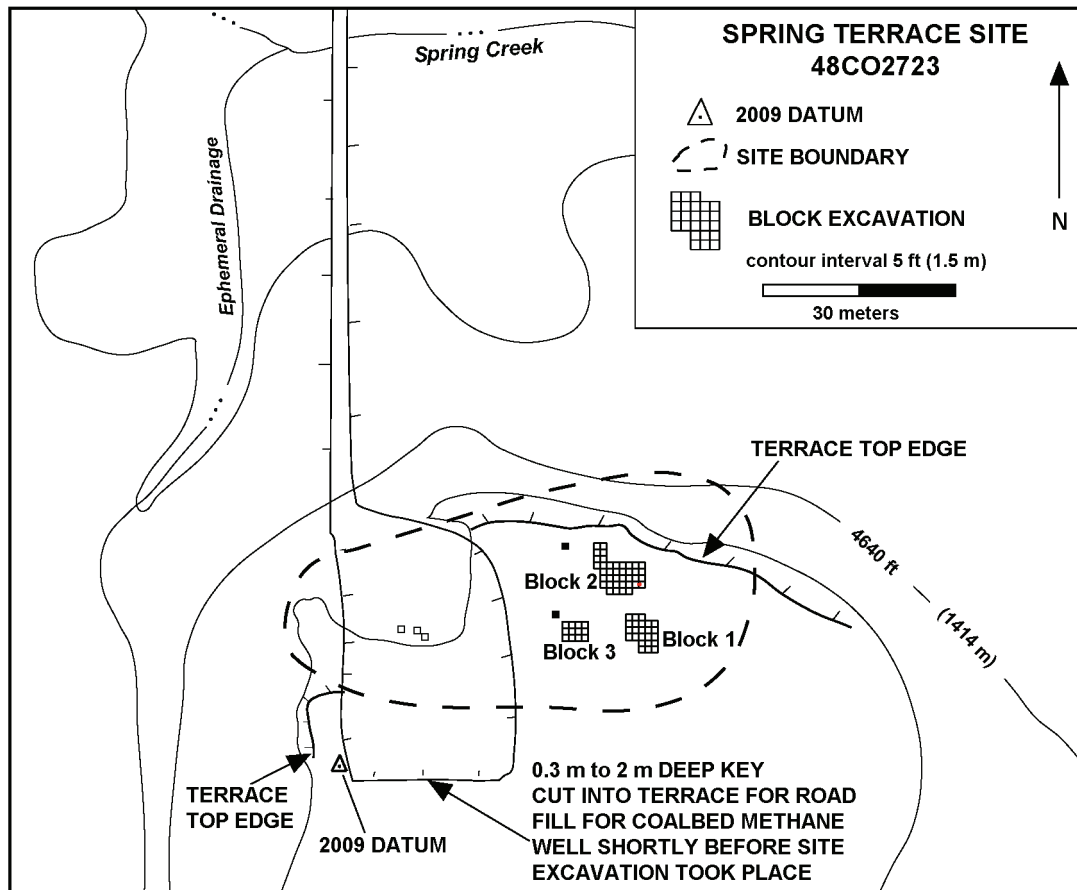


Figure 3: Site map of Spring Terrace site, 48CO2723.

six utilized flakes, one Late Prehistoric II side-notched arrow point, two side-notched Besant projectile points and five projectile point preforms. The modified tabular cobbles include scrapers, choppers and gravers. The unifacially modified flakes included a scraper, knives and spokeshaves and a graver. The Besant points are smaller than the typical Besant point.

Two ceramic sherds were collected from the surface of the site. They were body sherds from a fairly large vessel. The sherds were heavily smoothed, and one sherd showed a simple stamped exterior.

Six hundred and forty-six pieces of lithic debitage were recovered from the block excavations. Porcellanite was the most common lithic material, with 310 items. Chert was the second-most common lithic material,

with 186 items. Ironstone was third and is represented by 91 pieces of lithic debitage. Quartzite was fourth, with 34 pieces of lithic debitage. The remaining types of lithic material recovered included silicified wood, chalcidony, silicified sediment, agate and obsidian. All of the lithic material except obsidian can be obtained from gravel deposits within a few kilometers of the site. The one obsidian flake came from Obsidian Cliff in northwest Wyoming (Hughes 2009).

The faunal assemblage from the block excavations contained 555 bone specimens. Five species were identified, and they were pronghorn, bison, dog or wolf, jackrabbit and ground squirrel. In addition, bone fragments which could not be identified to species included 256 large mammal bone specimens, 43 large to medium mammal bone speci-

mens, 65 medium bone fragments, 18 intermediate mammal bone specimens, two small mammal bone fragments and seven unidentified animal bone specimens.

One piece of freshwater mussel shell was recovered from the site. The specimen was sent to Alan M. Cvancara of Casper, Wyoming, for analysis and he tentatively identified it as *Lampsilis cardium*, commonly called plain pocketbook. Currently, this species in Wyoming is only found in the North Platte drainage (Cvancara 2009).

Based on radiocarbon dates, there were four episodes of occupation at the site. Episode I took place around A.D. 50, Episode II took place around A.D. 240, Episode III took place around A.D. 1000 and Episode IV took place around A.D. 1200.

Episodes I and II took place during the transition from the Late Plains Archaic period to the Late Prehistoric I period. Each occupation was represented by just one thermal feature. Episode I took place in Block 1, and Episode II took place in Block 2. Episode III occurred during the Late Prehistoric I period and took place in Block 2. Three thermal features were associated with Episode III. Episode IV occurred during the transition between the Late Prehistoric I and Late Prehistoric II periods and took place in Blocks 1 and 3. One thermal feature in each block was associated with Episode IV.

The Episode I occupation, circa A.D. 50, included a rock-filled pit hearth, two unifacially modified flake scrapers, one utilized flake scraper and three dart-size projectile point fragments. In addition, several flakes, jackrabbit bone, large to medium mammal bone, large mammal bone, medium mammal bone and one freshwater mussel shell fragment were recovered. The three scraper tools were located northwest of and adjacent to the hearth. These are light-duty scrapers and would have worked for scraping an intermediate-size mammal hide. Since jackrab-

bit bone was recovered from the hearth, it is possible they were used for scraping the hide from a jackrabbit. These light-duty scrapers also would have worked for scraping dart shafts. In other words, it is possible both female and male activities took place and it is also possible only male activities took place. Episode I may represent the short-term camp of a single family or a hunting camp.

No artifacts could be assigned to the circa A.D. 240 Episode II occupation with any confidence because of the presence of an Episode III thermal feature adjacent to and at the same depth as the Episode II thermal feature. Episode II may represent a short-term hunting camp.

The circa A.D. 1000 Episode III occupation was represented by two pit hearths, one surface hearth, tools, flakes and animal bone fragments. Tools included a Besant point, utilized flake knives, a unifacially modified flake knife, unifacially modified flake scrapers, unifacially modified flake spokeshaves, a stone awl, a bone awl, a mano fragment, a cobble scraper, cobble choppers/scrapers, a cobble knife and graver, a preform fragment, a biface knife fragment and biface fragments. Associated animal bone fragments included pronghorn, bison, large mammal, large to medium mammal, medium mammal, intermediate mammal, small mammal and unidentified animal. There were no apparent specific task-oriented work areas. Instead, it appeared multiple activities took place in the area around the thermal features. Since the three features were less than two meters apart, it seems likely these artifacts were not produced by a band but by a single family.

The circa Episode IV occupation, A.D. 1200, took place in two areas separated by eight meters. Each area of occupation had just one thermal feature, a surface hearth. Tools found in association with Episode IV included a Late Prehistoric II arrow point, two biface fragments, a point preform, a uni-

facially modified flake knife, a unilaterally modified flake graver and a cobble chopper/scraper which may have also been used as a graver. Also recovered were several flakes and a few animal bone fragments including dog or wolf, large mammal, large to medium mammal, medium mammal, small mammal and unidentified animal. The low number of artifacts suggests there were not a large number of individuals occupying the site during Episode IV. This occupation may represent a short-term camp of two families.

In addition to the artifacts discussed above, two ceramic sherds were recovered from the surface outside of the block excavations. Since ceramic vessels became considerably more popular during the Late Prehistoric II, it is likely the ceramic sherds were associated with the Episode IV occupation.

The location of the Spring Terrace site

adjacent to Spring Creek, an intermittent stream, led to the assumption one or more bands occupied the site during each episode. The recovered data do not support this assumption. It appears the site was occupied by small families and perhaps at times by a small group of hunters.

ANTELOPE RIDGE SITE

The Antelope Ridge site (48CO2834) is an Early Plains Archaic through Late Prehistoric I period campsite located on a bench remnant, the gentle slope of the bench and the eroding terrace of the ephemeral drainage bordering the west and south sides of the site (Munson 2011b). The ephemeral drainage and Antelope Creek join 0.8 km northwest of the site.

The site was divided into Areas 1, 2 and 3 (Figure 4). Area 1 was on the western edge

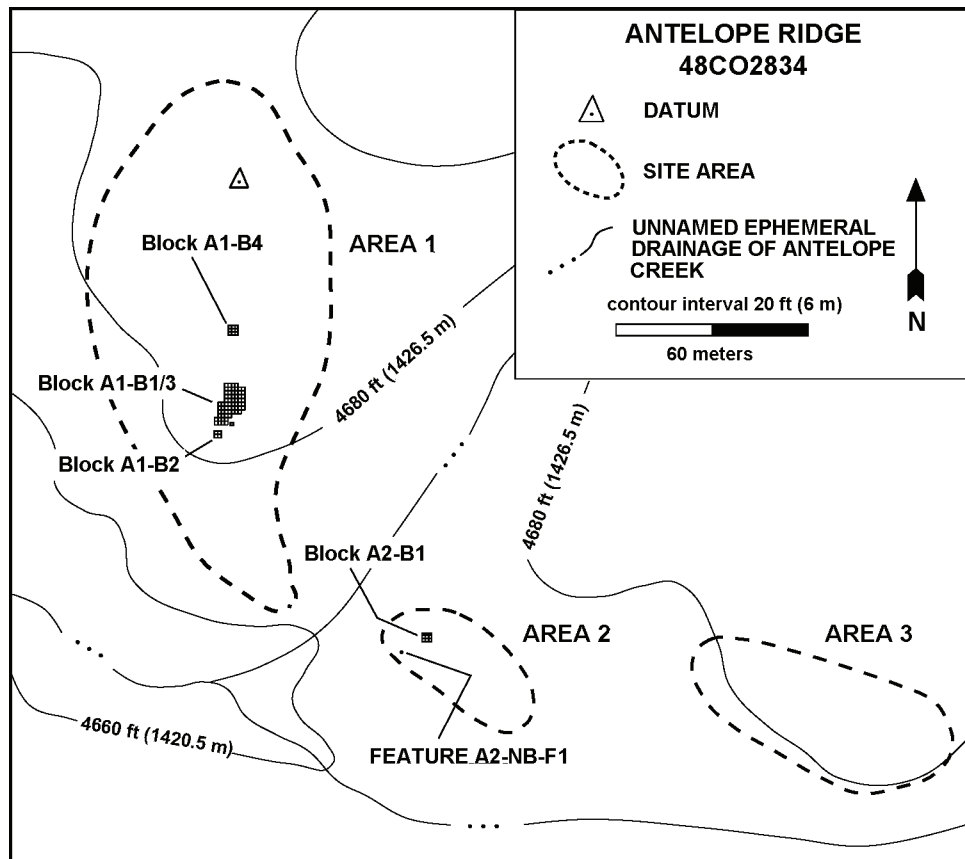


Figure 4: Site map of Antelope Ridge site, 48CO2834.

of a bench remnant which was 30 m higher in elevation than the Antelope Creek drainage channel located 0.8 km to the northwest. This is the first bench of several lining the south side of the Antelope Creek Valley. Shale and sandstone bedrock are exposed on the western and southern margins of Area 1. A small ephemeral drainage has cut into the bench, causing it to take the shape of a finger ridge where the site is located. The finger ridge slopes at a few degrees to the southwest. This ephemeral drainage separates Areas 1 and 2. Area 2 is southeast of Area 1 on the gentle southwest facing-slope of the bench. The drainage has exposed shale and sandstone bedrock along the western and southern margins of Area 2. Area 3 is east of Area 2, and these two areas are separated by a small and shallow ephemeral drainage. Area 3 is on a terrace remnant bordering the north side of the large ephemeral drainage which empties into Antelope Creek. The three areas measured 320 m northwest to southeast by as much as 125 m northeast to southwest. Area 1 covered around 7,500 square meters, Area 2 covered around 750 square meters and Area 3 covered around 2,000 square meters.

Ninety-four square meters were excavated at the site. This included 90 square meters of block excavations and four square meters of testing. The excavations took place in two locations, Area 1 and Area 2. Area 1 was on the bench portion of the site, and Area 2 was on the southwest-facing slope of the bench. All of the block excavations in Area 1 were at magnetic field gradient anomalies. The excavation at Area 2 was where a hearth was exposed on the surface.

The view from the site is extensive and is from the west to the northeast. It covers the Antelope Creek Valley. No doubt view played an important role in the selection of this site to camp.

On and off the site there is a plentiful supply of cobbles and small boulders of silicified

wood, gray orthoquartzite and ironstone. In lesser amounts, there are small cobbles and pebbles of chert and quartzite. The gravel was a ready source of material for knapping.

On-site vegetation includes a few big sagebrush (*Artemisia tridentata*), plains prickly pear (*Opuntia polyacantha*), soapweed yucca (*Yucca glauca*), needle-and-thread (*Stipa comata*), blue grama (*Bouteloua gracilis*), green needlegrass (*Nassella viridula*) and western wheatgrass (*Agropyron smithii*). Plains cottonwood (*Populus deltoides*) grows in abundance along Antelope Creek.

Based on radiocarbon dates, the site was occupied intermittently from around 4450 B.C. to around A.D. 1100.

Eighteen features were excavated at the site. Sixteen of the features included pits, one feature was a surface hearth and one feature was a fire-cracked rock cluster. Erosion had removed portions of the pits at several of the features. Most of the features showed substantial burrowing animal disturbance which destroyed portions of them. Fifteen of the pit features were hearths or ovens, and one pit was used for the storage of ceramic quality clay. Pits used for the storage of clay at local sites are extremely rare, with only two found to date.

Forty-two stone tools were collected from the site. Seven whole projectile points and two projectile point fragments and five bifacial fragments were recovered. Early Plains Archaic through Late Prehistoric I projectile point styles are represented. They include Early Plains Archaic Oxbow, Middle Plains Archaic McKean lanceolate, Middle Plains Archaic Hanna, Late Plains Archaic Pelican Lake and Late Prehistoric I Avonlea. Cobble tools included choppers, scrapers, hammerstones, manos, metate fragments and abrading stones. Ten of the utilized flakes were knives and one was a scraper. There was one utilized pebble scraper.

Three hundred ninety-three pieces of lithic debitage were recovered from the block excavations. Locally available ironstone (maroon quartzite) was the most common lithic material with, 120 items; and locally available silicified wood was a close second, with 113 specimens. Except for two of the 60 quartzite pieces of lithic debitage, this lithic material type probably came from the gravel found on and adjacent to the site. The two quartzite flakes look similar to Spanish Diggings quartzite. It is probable all 51 chert pieces of lithic debitage came from local gravel sources. As is typical of local sites, the 29 pieces of porcellanite debitage were of low quality. Only three Tongue River silicified sediment flakes are represented.

One sherd from a ceramic vessel was recovered from a rock-filled pit hearth with a radiocarbon age of around A.D. 540. Locally, ceramics are rare at this early period.

The faunal assemblage from Antelope Ridge site contained only 26 bone specimens and one mussel shell piece. None of the specimens could be identified to species. The one large mammal bone specimen was modern and was saw cut. The medium mammal bone included pronghorn-size specimens. The intermediate mammal bone was from a sub-adult jackrabbit-size mammal. The small mammal bone fragments included ground squirrel-size rodents. Some of the small rodent bone was burned, and this suggests these animals were included the diet of the inhabitants. The freshwater mussel shell fragment was the valve margin, so it could not be identified.

There were five episodes of occupation at the site. Episode I took place around 4450 B.C. Episode II took place around 2580 B.C., Episode III took place around 2100 B.C., Episode IV took place around A.D. 540 and Episode V took place around A.D. 1000.

A common theme took place during the first three episodes. The theme was the clus-

tering of thermal features. The following discusses these clusters.

Episode I, the Early Plains Archaic occupation, consisted of two thermal features located adjacent to one another and possibly a third thermal feature (not dated) about 80 cm to the west. The Oxbow point found 8.5 m north of this cluster of features may have been associated with the people who made these features. The features were not surrounded by a recognizable living surface.

Episode II, the first Middle Plains Archaic period occupation, consisted of a 3.5 m long northwest-to-southeast linear cluster of six features. The sixth feature was on the northwest end of the cluster. This feature was not radiocarbon dated, but probably was part of the Episode II occupation. Immediately surrounding the feature cluster were faint traces of charcoal-stained soil. Within this soil, as well as immediately above and below it, were two biface fragments and several flakes. The artifacts and charcoal-stained soil may have been the remnants of the living surface associated with the features.

Episode III had two separate thermal feature clusters representing the second Middle Plains Archaic occupation. They were not exact replicas of one another, but were fairly similar. At two standard deviations, the radiocarbon dates are statistically the same and may represent a single event around 3,600 to around 3,700 years ago. One feature cluster was in Block A1-B1/B3, and one feature cluster was in Block A1-B4.

The feature cluster in Block A1-B1/B3 consisted of two pit hearths or ovens located about seven cm apart and a third small pit which may have been some type of heat reservoir. The two pit hearths or ovens were aligned northwest to southeast. Burrowing animals had partially destroyed their pits. One pit was fairly cylindrical and originally may have been cylinder shaped. When excavated, it was in part a cylinder shape and in

part a bowl shape. The second pit was fairly bowl shaped. The small pit heat reservoir feature was 20 cm east of the pit hearths or ovens.

There were traces of charcoal-stained soil immediately around the cluster. This soil may be the remains of the living surface. Within the charcoal-stained soil and immediately above and below it were a mano, a metate fragment, a dart-size projectile point fragment, a utilized flake knife, a cobble chopper/scrapper and several flakes.

The cluster in Block A1-B4 consisted of two bowl-shaped pit hearths or ovens located 50 cm apart. They were aligned west-northwest. Burrowing animal disturbance had mostly destroyed the pits. What remained of the pits was bowl shaped. No charcoal-stained soil or other indication of a living surface was observed.

The three Middle Plains Archaic feature clusters at Antelope Ridge site were not exact replicas of one another, but the latter two feature clusters (Episode III) were substantially different from the earlier feature cluster (Episode II). The two large Episode III feature pits were fairly similar. At one cluster, the pits were separated by only seven cm and at the other cluster, the pits were separated by 50 cm. This is a fair amount of difference in spacing.

Most of the Middle Plains Archaic feature clusters at local sites other than Antelope Ridge were in house pits. These clusters are not considered comparable since they lie within the confines of a pit. At Workhorse site (48CA2892), one of the Middle Plains Archaic thermal feature clusters was in a house pit and the features were stacked on top of one another (Munson 2009). The second Middle Plains Archaic thermal feature cluster was not in a recognizable pit, but still several of the five features in the cluster were stacked. The upper portion of the house pit likely had been removed by erosion. Charcoal was

used for dating the features, and they have radiocarbon ¹⁴C ages (calibrated at 2σ) of 4070-4210 cal (Beta-240931) to 4210-4370 cal B.P. (Beta-240929). Features with older dates overly features with younger dates so the variation in radiocarbon dates likely was the result of burning older wood in some of the features. This feature cluster did not look like anything found at Antelope Ridge site.

At the Big Stay site (48CA1420), there was one feature cluster within the house pit and two Middle Plains Archaic feature clusters outside of the house pit (Munson 2010). One was immediately west of the house pit, and one was 30 m southwest of the house pit. Features within the two clusters radiocarbon dated to around 4,000 years ago. In the cluster adjacent to the house pit, the pit features clustered around a surface hearth as they did within the house pit. Three of features were small-diameter cylindrical pits, and three were bowl-shaped pits. They may have been used in some combination as hearths, ovens and storage.

The second Middle Plains Archaic feature cluster outside of the house pit at the Big Stay site consisted of five features, with four of the five in a fairly linear northwest-to-southeast alignment. In this respect, it was similar to the Episode II alignment at Antelope Ridge site. As at Antelope Ridge, one of the pits was so impacted by burrowing animal disturbance the original shape could not be determined. This is where the similarity ends. There was no surface hearth as at Antelope Ridge site, and the features did not have similar pit shapes or attributes. The feature at the northwest end of the alignment was a 50 cm diameter basin-shaped pit hearth partially lined with oxidized soil. The remaining three features had small bowl-shaped pits, one of which had some oxidized soil lining the pit wall.

The Episode IV occupation was unique because of the recovery of a ceramic vessel

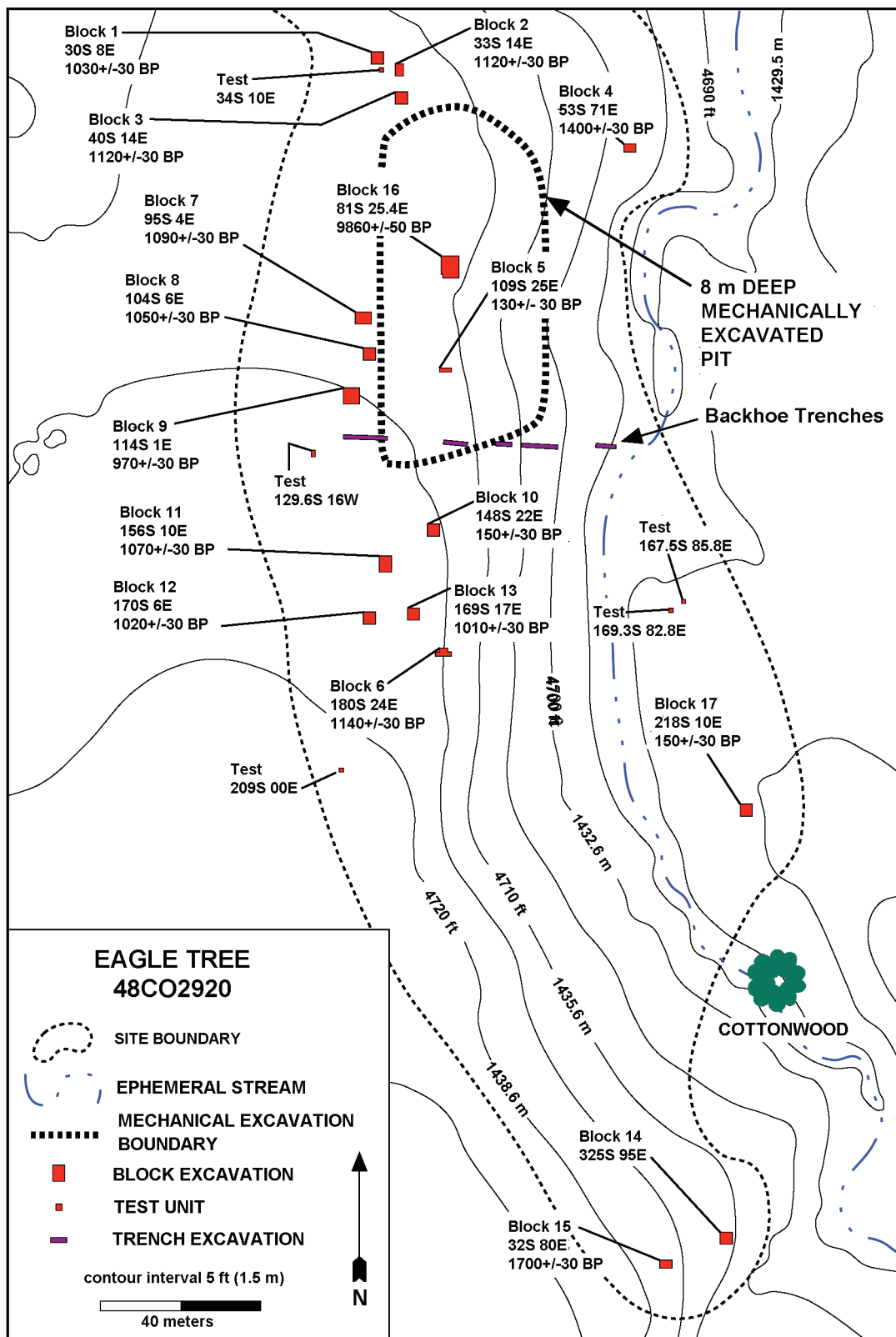


Figure 5: Site map of Eagle Tree site, 48CO2920.

sherd from the rock-filled pit hearth radiocarbon dated to around A.D. 540. None of the local sites I am aware of have ceramics dating this early in the Late Prehistoric I. The local Thunder Basin phase has small pinch pots and a variety of fired clay objects which may have their beginning around this time, but there are no large vessels.

The Episode V occupation had the unique clay-filled pit dating to around A.D. 1050. This is based on the radiocarbon date from charcoal recovered from a fire-cracked rock cluster partially covering the clay-filled pit. The purpose for the clay is unknown. The only other local clay-filled pit was found on Porcupine Creek at Running Elk site, 48CA2635 (Munson and Ferguson 1999b). This 130 cm diameter by 65 cm deep bowl-shaped pit was filled with 810 kg (dry) (1,785 lbs) of ceramic-quality clay. It was associated with the Thunder Basin phase. Support for the clay-filled pit at Antelope Ridge being associated with the Thunder Basin phase is provided by the small-diameter cylindrical pit used to hold the clay, because this is the type of pit used for hearths/ovens during the Thunder Basin phase.

Antelope Ridge site is one of the few local hill-top sites which have been excavated. An unknown number of erosion and soil deposition cycles took place since the site was first occupied some 5,600 years ago. Still, the site was remarkably intact.

One thing which really stands out at the site is Block A1-B1/3. For some unknown reason, people chose to camp at this nondescript location on the top of a bench intermittently for 4,600 years.

EAGLE TREE SITE

The Eagle Tree site (48CO2920) is a Paleoindian and Late Prehistoric I campsite (Munson 2016). The Late Prehistoric I component includes the Thunder Basin phase.

The site measures 440 m northwest to

southeast by as much as 110 m northeast to southwest and covers an area of around 39,000 square meters (Figure 5). The campsite is located 2 km south of Antelope Creek. Antelope Creek is a major tributary of the Cheyenne River. A south-to-north trending ephemeral drainage bisects the site. The major portion of the site is on the west side of the drainage and is on what is in part bench and in part terrace. The terrace proved to have over eight meters of Holocene soil deposits. The portion of the site on the east side of the ephemeral drainage rests on heavily eroded Paleogene period Fort Union Formation shale. One recently dead cottonwood tree and one living cottonwood tree were in the drainage at the site. This suggests the water table is currently near the surface. It is likely the presence of water was the reason the site was occupied in the past.

Present-day vegetation on and adjacent to the site included soapweed yucca (*Yucca glauca*), rubber rabbitbrush (*Ericameria nauseosa*), greasewood (*Sarcobatus vermiculatus*), big sagebrush (*Artemisia tridentata*), four-wing saltbush (*Atriplex canescens*), prairie sagewort (*Artemisia frigida*), plains prickly pear (*Opuntia polyacantha*), pincushion cactus (*Mammillaria* sp.), needle-and-thread (*Stipa comata*), blue grama (*Bouteloua gracilis*), green needlegrass (*Nassella viridula*), western wheatgrass (*Agropyron smithii*), Indian ricegrass (*Achnatherum hymenoides*) and plains cottonwood (*Populus deltoides*).

Soil samples from the fill of three features and a basket hopper mortar were sent to PaleoResearch Institute for pollen and phytolith analysis (Cummings and Milligan 2015).

Nearly 10,000 years ago pine and juniper trees were more abundant on the landscape than today. Alder and willow trees grew in a nearby drainage. Sagebrush dominated the shrubby and herbaceous vegetation community. Plants in the sunflower family, goose-foot and related plants possibly including

saltbush, plants in the mustard and legume families, wild buckwheat, a plant in the mint family, and globe mallow also grew as part of the early Holocene vegetation.

Samples representing more recent occupations, 1400 ± 30 B.P., 1090 ± 30 B.P., and 970 ± 30 B.P., yielded pollen records suggesting scattered pine and juniper trees, saltbush and related shrubs, sagebrush, various members of the sunflower family, grasses, and forbs such as plants in the mustard and legume families, wild buckwheat, prickly pear cactus, grasses, and greasewood. In the grass family cool season grasses grew abundantly, although there is some evidence for warm season short and tall grasses. Warm season short grasses increased in the most recent samples (1090 ± 30 and 970 ± 30 B.P.). Alder, hackberry, willow, and a member of the rose family grew in the drainage. Willow was observed only in the older samples (9860 ± 60 and 1400 ± 30 B.P.), while alder was noted in the upper three samples (1400 ± 30 , 1090 ± 30 , and 970 ± 30 B.P.), suggesting a change in riparian vegetation. Greasewood was documented in samples dating 1400 ± 30 and 970 ± 30 B.P., increasing in frequency in the most recent sample.

One hundred and sixty-nine square meters were excavated in 17 blocks and seven square meters of testing. The first occupation of Eagle Tree site was around 9,800 years ago during the Paleoindian period. The second occupation took place during the transition between the Late Plains Archaic and the Late Prehistoric I around 1,700 years ago. The third occupation was around 1,400 years ago, and the fourth and last occupation took place beginning 1,150 years ago and ended around 970 years ago.

A major discovery from the excavation of Eagle Tree site was the deeply buried Paleoindian component. This finding established not only the presence of a Paleoindian component in the Antelope Creek drainage

system, but also terraces far from the current Antelope Creek drainage channel are thick, and the lower portions date to the early Holocene where Paleoindian cultural deposits can be expected to be found. William Eckerle conducted the geological study of the site (Eckerle and Taddie 2015). They concluded the geological context of Eagle Tree site supports the Leopold and Miller (1954) Powder River Basin alluvial model as supplemented by the findings of Albanese (1990) and Haynes (2009).

The Paleoindian occupation was uncovered in Block 16. Block 16 was within a Holocene drainage channel exposed by the eight meter deep mechanically excavated pit. The top of hearth Feature B16-F1 was about 760 cm below the top of the terrace and 690 cm below the site datum. Feature B16-F1 was a 33 cm diameter by 12 cm deep bowl-shaped pit hearth with a rounded bottom. Charcoal recovered from the feature has a radiocarbon ^{14}C date (calibrated at 2σ) 9760-9960 cal B.P. (Beta-360793). Red oxidized soil on the pit wall was spotty and was up to 5 mm in thickness. The pit was filled with a charcoal- and ash-stained soil deposit with flecks of charcoal. Feature B16-F1 and Block 16 contained no artifacts.

Within the Late Prehistoric I component, 16 blocks were excavated totaling 139 square meters. In addition, six 1 by 1 m test units and two 0.5 by 0.5 m tests were excavated for an additional seven square meters of testing. All the block excavations and five of the six tests were placed at magnetic field gradient anomalies.

Seventeen features, including Thunder Basin phase hearth/ovens, were excavated. Some of the pit walls were not perfectly straight, making the pits more barrel or bell shaped. These deviations in the walls are likely the result of repeated cleaning and re-use. Sometimes the bottom portions of the pits were clearly expanded to accommodate

large sandstone slabs placed on top of a bed of hot coals. Thunder Basin phase small-diameter pit hearths/ovens when found in depositional environments such as on some of the terraces along nearby Porcupine Creek have pits more than 60 cm deep. In settings such as at Eagle Tree where there have likely been cycles of soil accumulation and soil deflation, it is probable the upper portions of some of the pits had been removed by erosion. One hearth/oven was removed and is at the Pioneer Memorial Museum in Douglas. One Thunder Basin phase hearth/oven from a site on Porcupine Creek is on display at the Wyoming State Museum in Cheyenne, and one is on display at the Rockpile Museum in Gillette.

Twenty-two stone tools were recovered from Eagle Tree. Of these, ten came from block excavations and twelve came from the surface outside of the block excavations. The tools included two biface knives, three cobble choppers, one cobble graver, three cobble scrapers, one cobble scraper and spokeshave, one cobble scraper and wedge, one cobble spokeshave, one core scraper and graver, one Early Plains Archaic Oxbow point modified into a drill (likely brought to the site during the Late Prehistoric I occupation), one Late Prehistoric I side-notched point, one basket hopper mortar, one mano, one mano and pestle, one metate and three unifacially modified flake knives.

The basket hopper mortar came from within a Thunder Basin phase hearth/oven (Figure 6). Steve Sutter, Wyoming Cultural Records Office Specialist, checked the Wyoming Cultural Records Office (WYCRO) database for basket hopper mortars, and Shane McCreary, Wyoming Cultural Records Office Supervisor, checked the Wyoming Cultural Resource Information System's (WYCRIS) database for basket hopper mortars. Of the three sites with recorded mortars, none had a basket hopper mortar (Personal Communica-

tion, Steve Sutter, March 27, 2014). A basket hopper mortar is a mortar with a bottomless woven basket attached to it. A circular groove the size of the basket is first made in the mortar. The basket is then set in the groove and is held in place with mastic. Since ponderosa pine is growing in the area, one possible mastic is pine pitch with charcoal intermixed. The mortar is used in conjunction with a pestle. A basket hopper mortar works well for making flour from seeds without having the wind blow the flour away.

The recovery of the basket hopper mortar combined with the repeated recovery of fired clay objects from local Thunder Basin phase sites adds to the possibility this Late Prehis-



Figure 6: Oblique view photo of basket hopper mortar catalog number CO2920-20 and a drawing of a basket resting on it.

toric I period cultural manifestation was directly or indirectly influenced by people living in the Great Basin.

Twenty-one fired clay objects were recovered from Eagle Tree. They included one figurine fragment (Figure 7), three tapered cylinder fragments, five tabular object fragments, two hollow cylinder fragments, two possible small pinch pot fragments, seven fired clay lumps and one heat spall from a fired clay object. The fired clay figurine fragment is the head of a zoomorph. It came from hearth/oven Feature B2-F1. One ear or horn is partially intact, and one is missing. The specimen broke where the neck and head connected. One small depression on each side of the head represents the eyes. The snout is narrow and tapered. There are no holes for nostrils as sometimes occurs on Thunder Basin phase zoomorphs. Quartz sand was used as temper. The specimen is made of well-fired clay. It would not have broken easily suggesting intentional breakage.

All three tapered cylinder fragments came from hearth/oven feature B3-F1. They probably are from the snouts of three zoomorphic figurine heads. The distal ends of all three are intact, and the ends are rounded. Two are slightly flattened, and one is more flattened.

All three were quartz-sand tempered.

One bone bead was recovered from the Thunder Basin phase occupation. It came from hearth/oven Feature B8-F1. The bead was made from an intermediate mammal limb bone. Under 20x magnification, portions of the bead show considerable polish. The bore measures only 1 mm across.

Two hundred and twenty-seven pieces of lithic debitage was recovered from the excavations. This included 83 porcellanite, 20 quartzite, 19 chalcedony, 26 chert, six Tongue River silicified sediment, 68 ironstone, three silicified wood and two agatized wood. All of the lithic materials may have come from local sources. The porcellanite and Tongue River silicified sediment may have come from outcrops and gravel sources. The ironstone, quartzite, chalcedony, chert, silicified wood and agatized wood may have come from local gravel deposits. An excellent source for these materials is Pumpkin Buttes located 48 km (30 miles) northwest of the site.

One thousand and eleven bone specimens were recovered from Eagle Tree. Bone identified to species included five pronghorn specimens and 59 jackrabbit specimens. Bone which could not be identified to species was placed in categories based on robust-

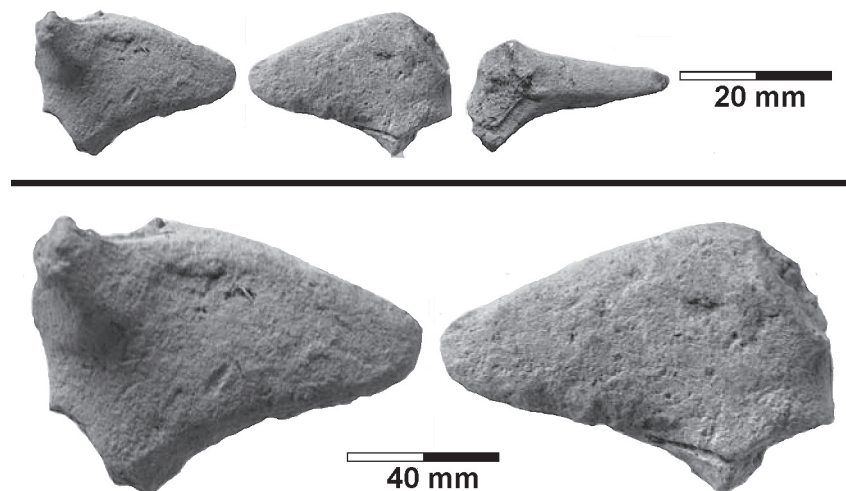


Figure 7: Photos of the head from a fired clay zoomorphic figurine.

ness. The bone specimens included 14 large mammal, 97 large to medium mammal, 128 medium mammal, 324 medium to intermediate mammal, 299 intermediate mammal, 27 intermediate to small mammal and 59 small mammal. None of the small mammal bone specimens is burned, and they are likely from natural causes. All of the features from Eagle Tree were riddled with animal burrows, which would have allowed small animals access to the features.

The only charred seeds recovered from the site came from a Thunder Basin phase hearth/oven. The more than 100 plains prickly pear cactus seeds were likely accidentally introduced into the hearth/oven. Three Thunder Basin phase hearths/ovens contained charred plains prickly pear cactus pads. Their presence suggests prickly pear was roasted in these hearths/ovens. If they were harvested for food, the optimum season would be spring and into summer when they are the most plump from spring rains and summer thunderstorms.

SUMMARY

Only Eagle Tree site contained a Paleoindian occupation. The only site with an Early Plains Archaic occupation was Antelope Ridge. This site also included the only Middle Plains Archaic occupation(s). Spring Rings site and Spring Terrace were occupied during the Late Plains Archaic. All four sites had occupations dating to the Late Prehistoric I. Spring Terrace site was the only site occupied during the Late Prehistoric II.

The four sites had different physical settings. Spring Rings site was on a low and narrow finger ridge, on the sloping face on the end of the finger ridge and on the terrace of an ephemeral drainage. Spring Terrace site was on the first terrace of Spring Creek, an intermittent stream. Antelope Ridge site was on a high bench, on the gentle slope of the bench and on the eroding terrace of the

ephemeral drainage. Eagle Tree site was on a terrace and low bench adjacent to an ephemeral drainage. These specific settings include most settings found in the eastern portion of the Powder River Basin. In other words, all settings should be considered as having potentially significant sites.

Locally available gravel capping some of the ridges was used as the primary lithic source. Overall, the sites had low quantities of lithic debitage. This may reflect most lithic reduction taking place off-site, perhaps at the lithic sources. Cobble tools made from tabular quartzite cobbles were the dominant tool type associated with the Thunder Basin phase.

Prey species included bison (*Bison* sp.), pronghorn (*Antilocapra americana*), jack-rabbit (*Lepus* sp.), prairie dog (*Cynomys* sp.), ground squirrel (*Urocitellus* sp.) and dog or wolf (*Canis* sp.). The deer mouse (*Peromyscus* sp.) specimen was not charred and probably is from natural causes.

All of the block excavations with the exception of two were placed at thermal feature-caused magnetic anomalies located by a gradiometer. Geoffrey Jones, Archaeo-Physics, LLC conducted the surveys. Without the gradiometer surveys, the sites would have produced little information.

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COMMUNAL PRONGHORN PROCUREMENT AND RESIDENTIAL USE SPANNING THREE MILLENNIA: EXCAVATIONS AT THE BATHTUB SITE

by
AMY NELSON

ABSTRACT

The Bathtub Site (48LN3997), located in the Green River Basin of southwest Wyoming, underwent data recovery by Metcalf Archaeological Consultants, Inc. (Metcalf) in 2010 and 2011 as part of the Ruby Pipeline project. Situated just east of Oyster Ridge and northeast of Cumberland Gap, excavations totalling 268 sq m focused on a mid to late Holocene sand shadow. Metcalf's work revealed the presence of at least four prehistoric cultural components. Stratigraphy, projectile point styles, and radiocarbon dates indicate occupations of varying intensity during the Early Archaic, Late Archaic, and the Late Prehistoric periods. The two best represented components include a series of Late Prehistoric Uinta phase occupations demonstrating use of multiple house pits and pronghorn procurement and a Late Archaic Pine Spring phase occupation also focused on pronghorn procurement. There is evidence to suggest pronghorn procurement in both phases was the result of springtime mass kills. Besides the two well-defined cultural zones, evidence of minor use during the Late Archaic Deadman Wash phase is represented by one radiocarbon date, and an Early Archaic Opal phase component is suggested by a suite of side-notched dart points and a house pit. Data from these cultural components, particularly with regard to springtime

pronghorn procurement, are used to examine similarities and differences in long-term exploitation of the same landscape over a period of at least three millennia.

INTRODUCTION

The Bathtub site is a multicomponent camp located about 0.5 miles east of Oyster Ridge, a north-south trending hogback extending nearly 60 miles from Kemmerer, Wyoming to just east of Evanston, Wyoming (Figure 1). The site lies in a narrow valley drained by an intermittent tributary of Little Muddy Creek. The site covers an area of about 170,000 sq m or 42 acres. Vegetation in this area is primarily characteristic of a mixed sagebrush steppe and desert shrub plant community and consists of low sage, bunchgrasses, rabbitbrush, and prickly pear cactus. The western edge of the site is defined by a steep hogback; the northern site boundary is near a prominent hill and historic mine. Onsite topography is characterized by rolling hills, hummocks and a low eroded ridge which bisects the site north to south creating an obstruction and caused the formation of an extensive sand shadow on the leeward slope. Deposition consists largely of Holocene fine-grained aeolian sand overlying alternating strata of regolith composed of calcareous mud, shale, and sandstone bedrock (Mayer et al. 2015). Deposition is discontinuous as demonstrated by widely scattered bed-

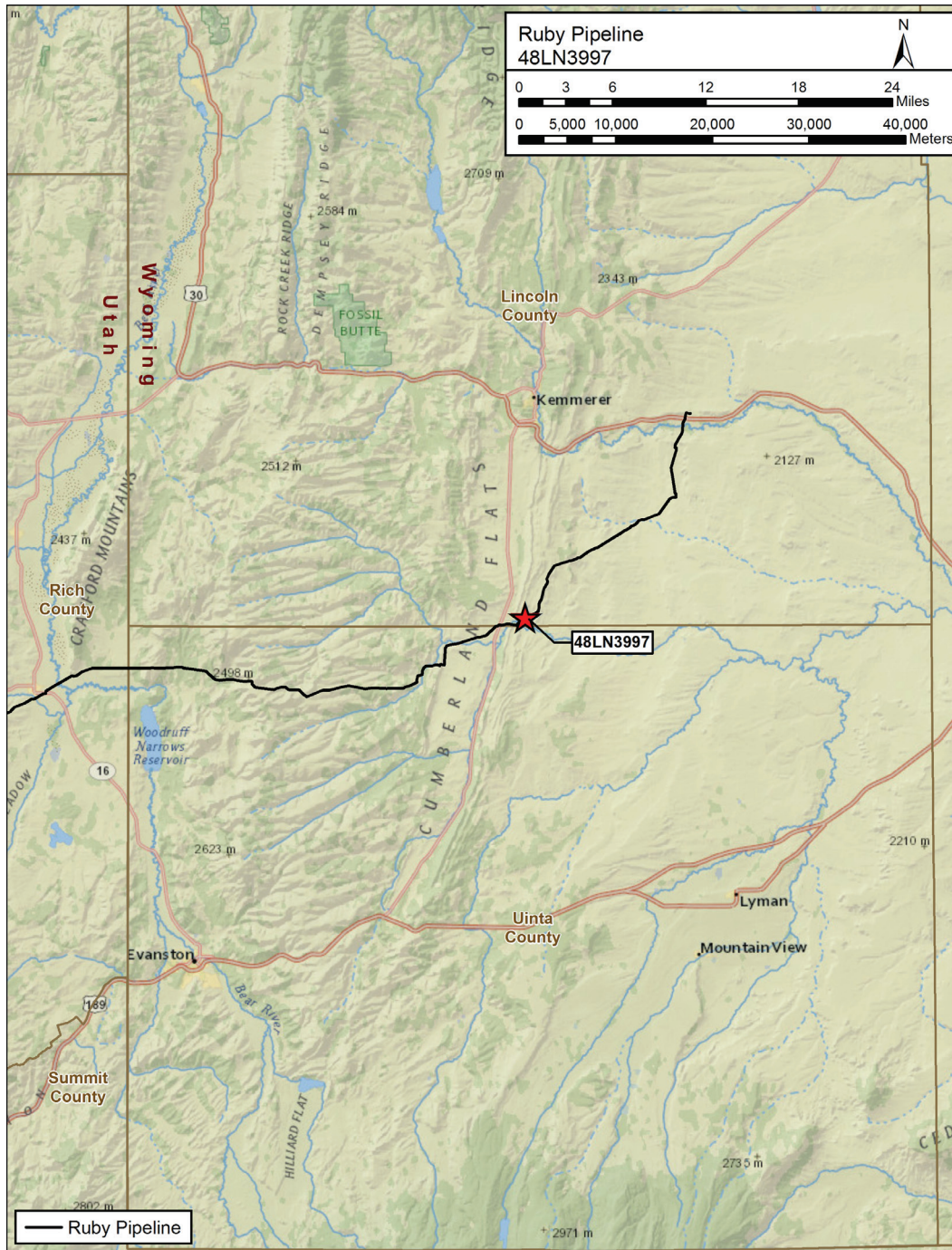


Figure 1: Site location map.

rock exposures at the surface, the undulating bedrock at the base of excavations, and varied sediment depths ranging from 0 to 110 cm below surface (cmbs).

The site was first recorded in 2002 by Current Archaeological Research. In 2009, EPG conducted limited testing to evalu-

ate effects related to construction of the proposed Ruby Pipeline (Dobschuetz et al. 2010). Based on the results of this testing, Metcalf began data recovery excavations in 2010 in sand shadow deposits near the southern end of the site to address the adverse effects of pipeline construction.

Over two field seasons, Metcalf excavated 268 sq m divided among eight excavation blocks and 19 scattered test units and conducted both right-of-way monitoring and open trench inspections during pipeline construction (Figure 2). Reaching just over one meter in depth, excavations exposed Uinta phase occupations lying unconformably over an Archaic Pine Spring phase cultural component which included an Archaic house pit. In addition, radiocarbon dates and projectile points are also indicative of occupation during the Late Archaic Deadman Wash phase and the Early Archaic Opal phase.

In all, Metcalf's data recovery and construction phases for the Ruby project exposed four house pits, two house-like basins, and 126 small features as well as an extensive artifact assemblage which included chipped and non-chipped stone tools, bone implements, stone, bone and shell beads, and stone and shell pendant fragments as well as a large faunal assemblage primarily consisting of pronghorn remains. The faunal assemblage suggests evidence the site was used during the Late Archaic and Late Prehistoric periods for large-scale pronghorn processing during springtime hunts which were likely communal events. Complete details on Metcalf's excavations at this site can be found in Nelson (2015).

CHRONOLOGY

Metcalf obtained 14 Accelerator Mass Spectrometry (AMS) dates from the Bath-tub site which supplement the three dates previously reported by EPG (Dobschuetz et al. 2010). These 17 radiocarbon ages range from 1040±40 to 4310±90 BP (Table 1). A scatterplot of date centroids clearly illustrates two main date clusters, one in the Late Prehistoric Uinta phase and one in the Archaic Pine Spring phase, with a

single Deadman Wash phase date isolated between the two clusters (Figure 3).

Intensive use of the site area during the Late Prehistoric Uinta phase (1800-650 BP) (Thompson and Pastor 1995) is indicated by 13 dates. The range of the Uinta phase date cluster spans over 700 years, indicating as many as five use periods though most of the cultural activity appears to have occurred within two or three time intervals. A complex sequence of Late Prehistoric occupation is shown by sub-clusters of radiocarbon dates, by intersecting and superimposed hearths, by stratigraphic superpositioning of pronghorn processing debris over house pits, and by tool refit patterns. Uinta phase materials were found in every excavation block, ranging from surface hearths to intact hearths and house pits buried as deeply as 50 cm.

Projectile points collected from the site also support intensive use of the area during the Uinta phase (Table 2). Small Corner-notched projectile points are the most common type found with 95 of the 160 projectile points collected falling into this typology (Figure 4). Eighty-seven are consistent with Rose Spring projectile points generally associated with the early Late Prehistoric period (Table 2). The other eight small corner-notched arrow points are similar to the Rose Spring type and are also most likely associated with Late Prehistoric occupations.

A single radiocarbon date (2430±30 BP) falls within the Late Archaic Deadman Wash phase (2800-1800 BP) (Thompson and Pastor 1995). The dated hearth was located in an isolated activity area in the MT Block near the southern extent of the excavations. No other intact Deadman Wash phase materials were identified. Instead, it appears Uinta phase deposits sit unconformably atop Pine Spring phase deposits

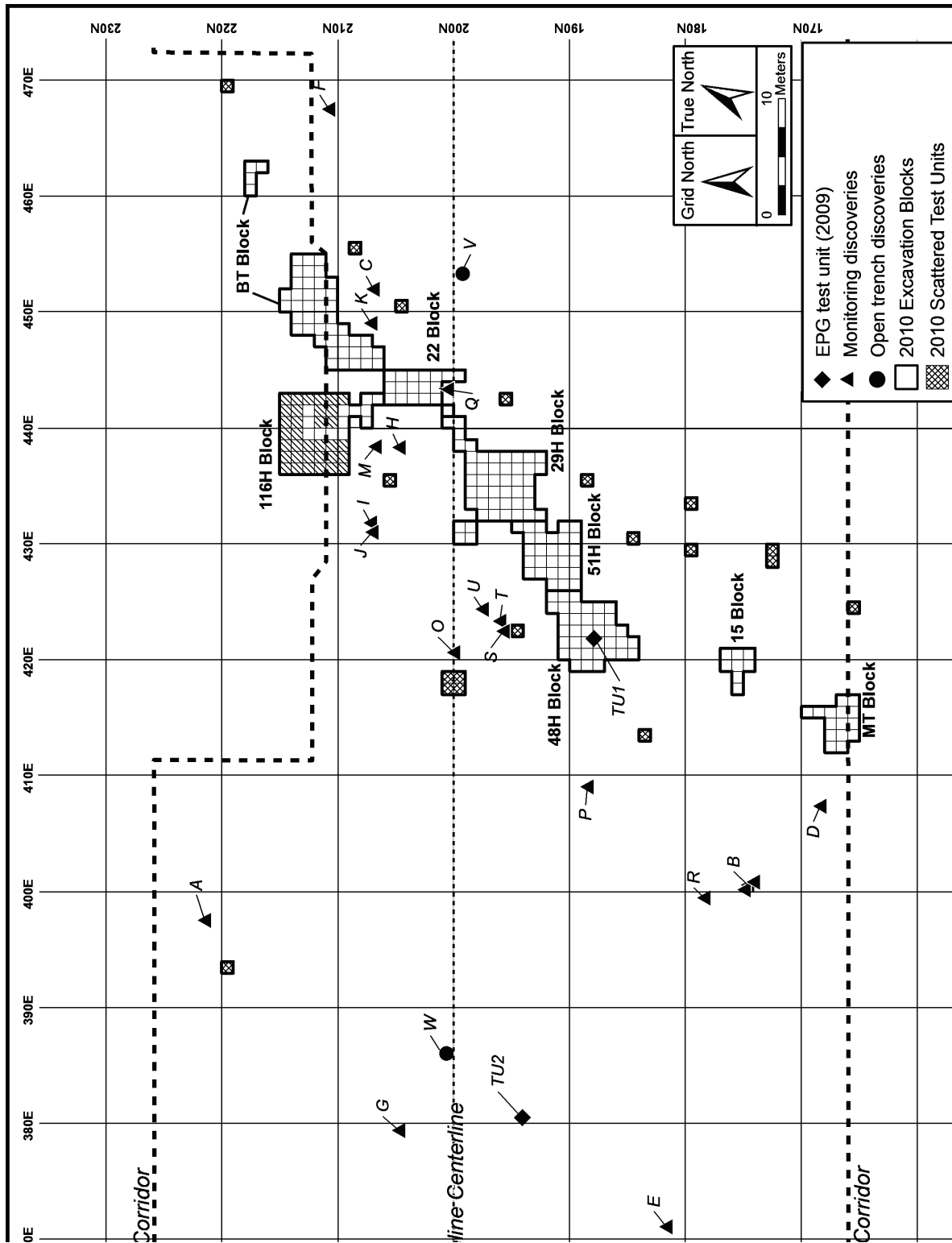


Figure 2: Map of data recovery excavations and construction discoveries.

Table 1: Radiocarbon ages

¹⁴ C AGE B.P.	δ ¹³ C	CAL BP AGES 2-σ ≥ .05 PROBABILITY	RELATIVE PROBABILITIES FOR AGE RANGES	MEAN CAL BP AGE RANGES	FEA. # (CAT#)	EXC. BLOCK	SAMPLE TYPE	LAB #
DEADMAN WASH PHASE (AU2)								
2430±30	-25.9‰	2353-2520	0.73	2437	F33 (.78)	MT	sage charcoal ^a	Beta-320207
		2591-2615	0.06	2603				
		2636-2698	0.20	2667				
UINTA PHASE (AU3)								
1040±40	-24.0‰	907-1057	0.98	982	F9 (EPG)	n/a	charcoal	Beta-265989
1170±40	-23.3‰	975-1179	0.99	1077	F7 (EPG)	n/a	charcoal	Beta-265988
1180±40	-25.0‰	979-1039	0.16	1009	F26 (.1955)	29H	sage charcoal ^b	Beta-286075
		1043-1182	0.81	1113				
1227±18	18.73‰	1252-1255	0.06	1254	.668	48H	<i>Antilocapra</i>	GNS-R40139/1;
		1203-1241	0.21	1222			<i>americana</i>	NZA51782
		1071-1184	0.73	1128			(pronghorn)	
							humerus	
1235±18	19.07‰	1200-1259	0.41	1230	.1872	29H	<i>Antilocapra</i>	GNS-R40139/2;
		1080-1187	0.54	1134			<i>americana</i>	NZA51785
							(pronghorn)	
							metacarpal	
1220±30	-22.3‰	1063-1186	0.79	1125	F17 (.2533)	22	sage charcoal ^a	Beta-320206
		1201-1258	0.21	1230				
1230±30	-24.2‰	1068-1189	0.67	1129	F41 (.4938)	BT	sage charcoal ^a	Beta-320208
		1198-1261	0.33	1230				
1270±30	-22.6‰	1168-1286	0.95	1227	F34 (.1765)	29H	sage charcoal ^b	Beta-340967
1320±60	-22.7‰	1122-1338	0.97	1230	F68 (.1501)	51H	sage charcoal ^b	Beta-286077
1330±30	-20.6‰	1180-1209	0.19	1195	F15 (.314)	15	sage charcoal ^a	Beta-334183
		1229-1302	0.81	1266				
1330±30	-24.4‰	1180-1209	0.19	1195	F117 (.5152)	116H	sage charcoal ^a	Beta-320210
		1229-1302	0.81	1267				
1350±60	-23.4‰	1168-1381	0.99	1275	F49 (.572)	48H	sage charcoal ^b	Beta-286076
1610±40	-23.9‰	1403-1571	0.97	1487	AP-23 (EPG)	n/a	charcoal	Beta-265491
ARCHAIC (AU4)								
4144±18	-17.65‰	4779-4819	0.20	4799	.4044	116H	<i>Antilocapra</i>	GNS- 40146/1;
		4749-4768	0.79	4759			<i>americana</i>	NZA51833
							(pronghorn)	
							tibia fragment	

4230±30	-23.9‰	4649-4672 4700-4759 4807-4856	0.37 0.57	0.07	4661 4730 4832	F112 (.3420)	116H	sage charcoal ^a	Beta-320209
4310±90	-23.9‰	5164-5280 4609-4768 4782-5076	0.08 0.17 0.73		5222 4689 4929	F22 (.2570)	22	sage charcoal ^b	Beta-286074

Note: All Metcalf dates are AMS; All calibrations were done using CALIB 6.0.2 with IntCal09 calibration curve and are presented as years before present (1950) <http://radiocarbon.pa.qub.ac.uk/calib/calib.html>.

^aCharcoal analyst, Kathy Puseman, with assistance from Peter Kovacic, PaleoResearch Institute.

^bCharcoal analyst, Kelly Pool, Metcalf Archaeological Consultants, Inc.

in the northern portion of the excavation area. Although the hearth dated to the Deadman Wash phase was not associated with any projectile points, seven large or medium corner-notched dart points, two types often associated with Late Archaic occupation, were found widely scattered across the excavation area (Figure 4). Although medium to large Corner-notched points are sometimes found in earlier time periods, this scattered distribution may be an indication of a disturbed or deflated Late Archaic Deadman Wash phase occupation surface.

The three earliest radiocarbon dates are attributed to Pine Spring phase (4300-2800 BP) (Thompson and Pastor 1995) use of the site. The earliest date, 4310±90 BP, came from F22 hearth charcoal in the 22 Block where it was associated with materials including Duncan-Hanna projectile points. Feature 112, initially thought to be a floor feature within the 116H Block house pit, dated to 4230±40 BP. Finally, bone collagen from an assemblage of pronghorn bone overlying the same house pit yielded a radiocarbon date of 4144±18 BP.

The earliest date (4310±90 BP) falls on the cusp between the Early Archaic Opal phase (6500-4300 BP) (Thompson and Pastor 1995) and the Pine Spring phase; however, it overlaps the 2-sigma calibrated age range of the later two Pine Spring dates and most likely pertains to the same occupation. Twenty-six Stemmed and four McKean Lanceolate points (Figure 4) generally support use of the site during the Late Archaic period (Table 2). Duncan-Hanna and McKean Lanceolate points were concentrated in the northern excavation blocks and were generally found in the upper part of the Archaic cultural component in good stratigraphic association with radiocarbon dates.

In contrast, Side-notched projectile points, typically ascribed to the Early Archaic Great Divide or Opal phases, were concentrated in the northern excavation blocks but were found at varying levels within the stratigraphy. Most of the 15 Medium to Large Side-notched dart points, five of which are classified as the Northern Side-notched type (Table 2), are heavily reworked and may represent tools abandoned during an earlier occupation and repurposed during later occupations.

The Early Archaic occupation(s) is largely eroded. Stratigraphic studies indicate presence of an eroded middle Holocene sediment unit overlain by the later Ho-

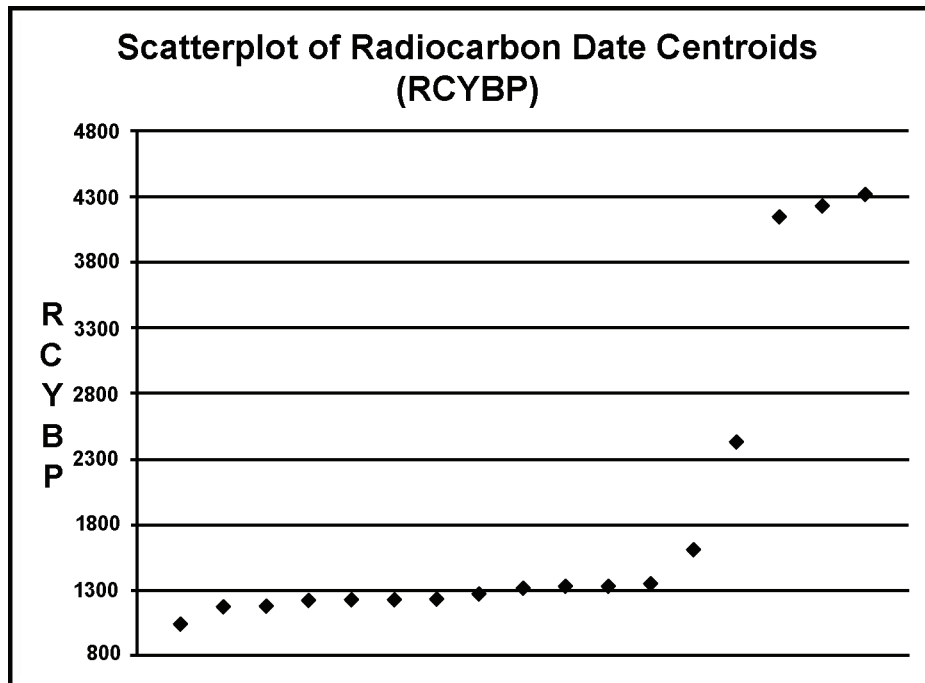


Figure 3: Scatterplot of radiocarbon date centroids.

locene sand shadow deposits housing the intact later components of the site (Mayer et al. 2015). The deepest hearths, as well as the Archaic house pit, were excavated into this middle Holocene sediment unit, where it was present, or into underlying bedrock. The best interpretation of the stratigraphic sequence is an Early Archaic – probable Opal phase – occupation, occurred within the middle Holocene sedi-

ment unit. It was subsequently eroded, and an Archaic house pit may be the only intact feature left from this occupation (Nelson 2015).

Because little cultural material could definitely be associated with either the Early Archaic period or the Deadman Wash phase occupations, they are not discussed further. Instead, this paper focuses on the well-defined Uinta phase and Pine Spring

Table 2: Projectile Points

PROJECTILE POINT TYPE	DATES	NUMBER
Rose Spring (87), other small arrow (8)	1800 BP to 900 BP (Holmer and Weder 1980:56; Metcalf 2011a; Thompson and Pastor 1995:53)	95
Medium (2) to large corner-notched (5) (e.g., Elko Corner-notched)	After 8000 BP but more commonly 3400 BP to 1800 BP (Kornfeld et al. 2010)	7
Duncan-Hanna (10), other stemmed (16)	5000 to 3000 BP (Frison 1991:91; Metcalf 2011a)	26
McKean Lanceolate	5000 to 3000 BP (Frison 1991:91; Metcalf 2011a)	4
Northern Side-notched (5), other medium to large side-notched (10)	6500 to 4300 BP (Metcalf 2011a; Thompson and Pastor 1995)	15
Unidentified	Unknown	11
TOTAL		160

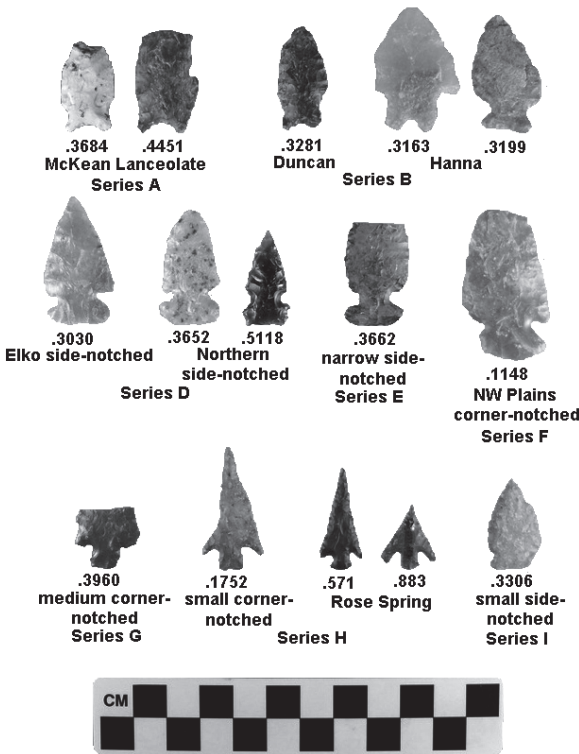


Figure 4: Sample of diagnostic projectile points (labeling follows Metcalf 2011a).

phase occupations at the site. Both components had evidence of house pit use followed by intensive pronghorn processing and radiocarbon ages primarily fall into two time clusters: 1350 to 1180 BP (Uinta phase) and 4390 to 4144 BP (Pine Spring phase).

RESULTS

LATE PREHISTORIC UINTA PHASE COMPONENT

A large pronghorn bone assemblage, three house pits, one house-like basin, and 85 small features, including many of which overlapped (Figure 5), provide ample evidence the Late Prehistoric peoples returned to site 48LN3997 multiple times. The remains of 18 pronghorn and nine fetuses recovered from an upper Uinta phase component appear to represent a communal hunting and processing event. Neither a kill site nor a camp associated

with pronghorn processing was identified. Three house pits exposed at the base of excavations in the central portion of the excavation area appear to be remnants of two Late Prehistoric occupations predating the pronghorn processing event.

Evidence of pronghorn processing was spread across nearly all of the 241 sq m encompassed within the Uinta phase component. The pronghorn bone exhibits breakage, impact fractures, cut marks and burning which provide clear evidence of human use (Lee 2015). A mass kill is suggested by the wide range of ages from fawn to seven years of age (Lee 2015). Evidence of seasonality comes from fetal bone which suggests animals were killed in mid-April to mid-May (Lee 2015). Four associated radiocarbon dates, including two from pronghorn bone collagen and two from hearth sagebrush charcoal, cluster tightly between 1220 and 1235 BP and suggest the bone is from one communal event or several closely spaced use episodes.

Communal pronghorn hunts probably using drive lines and corrals or jumps are known to have occurred as early as 9,000 to 10,000 years ago in western North America (Hockett and Murphy 2009:708-709). Terrain which would have facilitated hunts using these techniques exists in the narrow valley where the site is located. Although no direct evidence of their use has been recorded near the Bathtub site, the Fort Bridger trap (48UT1) is about 12 miles south-southwest.

The location of the pronghorn kill site is unknown but it likely was near this processing site. Based on the similar frequency of crania and forelimb and hindlimb elements, whole pronghorn carcasses appear to have been transported to the site (Lee 2015). Although pronghorn are light enough to be carried without some initial butchering, it seems unlikely freshly killed

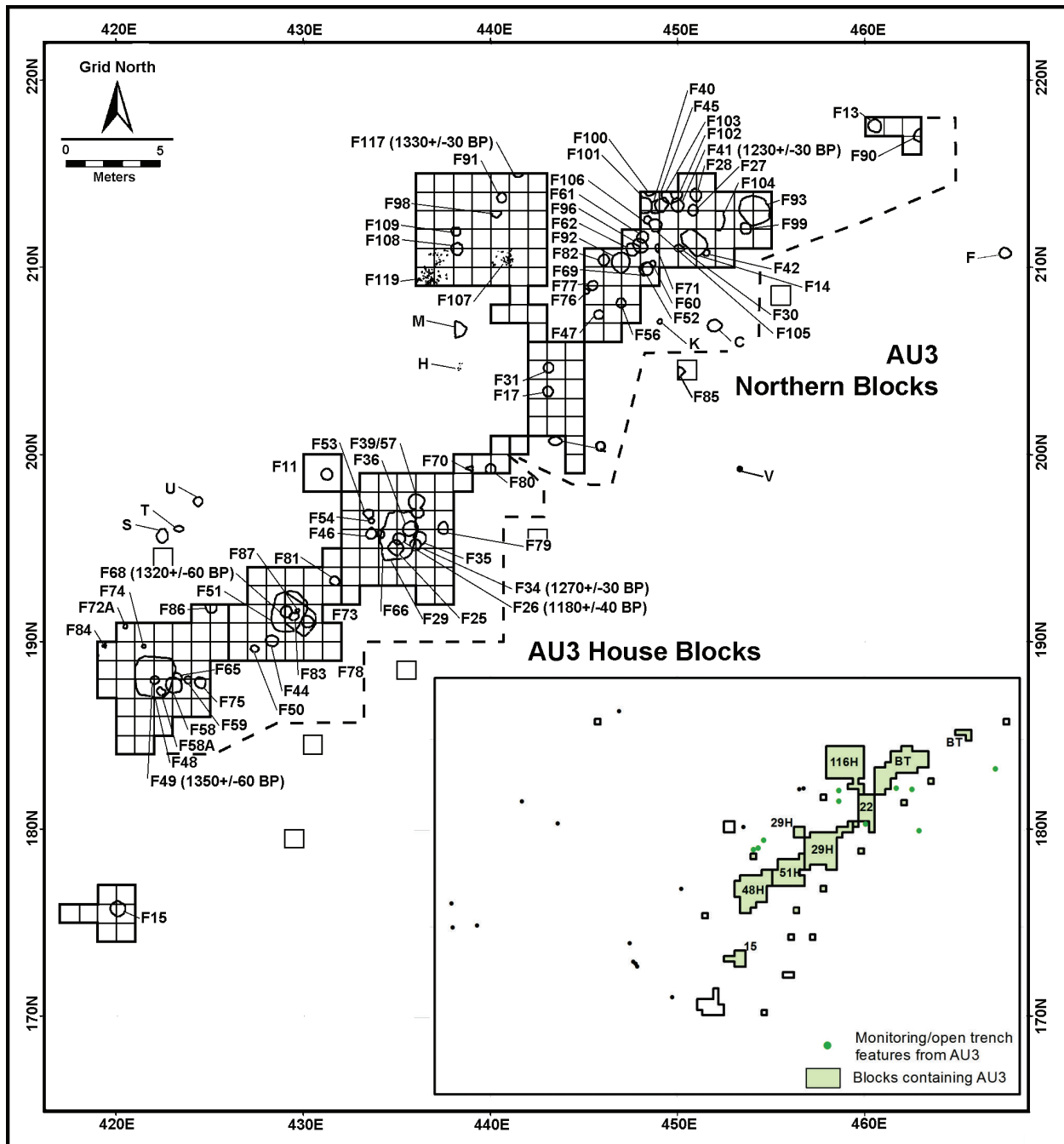


Figure 5: Late Prehistoric Uinta phase component (AU3) excavation area and features.

animals would have been transported great distances.

At least four separate pronghorn processing areas were identified in the Uinta phase component and whole animals appear to have been butchered in each locale. In the central part of the excavation block,

pronghorn remains were concentrated in or near the three house pit depressions from previous occupations (Figure 5). Faunal evidence suggests bones were broken for marrow extraction and grease-rich elements such as long bone epiphyseal ends appear to have been processed for bone

grease (Lee 2015). Breakage for bone grease production may account for the low representation of vertebrae in the Uinta phase assemblage.

There is evidence rabbits, beaver, and possibly, elk or bison were also part of the Late Prehistoric inhabitants’ diets. One flake tool (.1556) sent for protein residue analysis tested positive for rabbit. Groove-and-snap rabbit bone beads and bead-making debris provide evidence rabbit bones were used to make ornamental items. It is reasonable to suggest rabbit played at least a minor role in the Late Prehistoric subsistence strategy.

Additional evidence regarding subsistence comes from the presence of mussel shell. One nearly complete, unmodified mussel shell was identified as *Margaritifera falcata* or Western pearlshell (Picha 2015) and other small fragments tentatively identified as mussel shell were also recovered from across the Uinta phase cultural zone, suggesting mussel provided another element of the Late Prehistoric inhabitants’ diet. Western pearlshell would have been readily available from the Little Mud-dy Creek drainage and many other drain-

ages west of the Continental Divide.

Evidence of plant processing during Late Prehistoric occupations is largely circumstantial. Because most of the ground stones were repurposed as heating stones or as pit lining and were burned or recovered from hearths, their original use as milling implements cannot be directly related to Late Prehistoric activities. In addition, macrobotanical, pollen, and starch analyses produced minimal results. A weak suggestion for processing a member of the mustard family (Brassicaceae) came from one metate tested for pollen and starch (Cummings et al. 2015).

Table 3 shows the artifact assemblage recovered from the Uinta phase cultural zone. Fifty-two Rose Spring projectile points and three small corner-notched points consistent with the Late Prehistoric Uinta phase dates were clustered with the pronghorn remains (Figure 6). A small number of Archaic dart points were also clustered among the pronghorn debris but they were found predominantly in the northern blocks where the Late Prehistoric component overlies an Archaic cultural zone. Evidence of reworking and resharp-

Table 3: Late Prehistoric Uinta Phase Component Artifacts

ARTIFACT TYPE	FUNCTIONAL CLASS	COUNT
Chipped stone	Projectile point	86
	Other biface (Stages 2-6)	168
	Flake tool/Utilized flake	154
	Core	35
	Debitage	27,093
Non-chipped stone	Mano/Rectangular milling stone	6
	Metate	7
	Mortar	1
Bone implement	Awl/Needle	10
	Unidentified	11
Decorative/ non-utilitarian	Stone bead (Type 1, n=33; Type 2/3, n=6)	39
	Stone pendant fragment	4
	Other shaped/modified stone	6
	Bone bead/bead making debris	5
	Shell bead	1

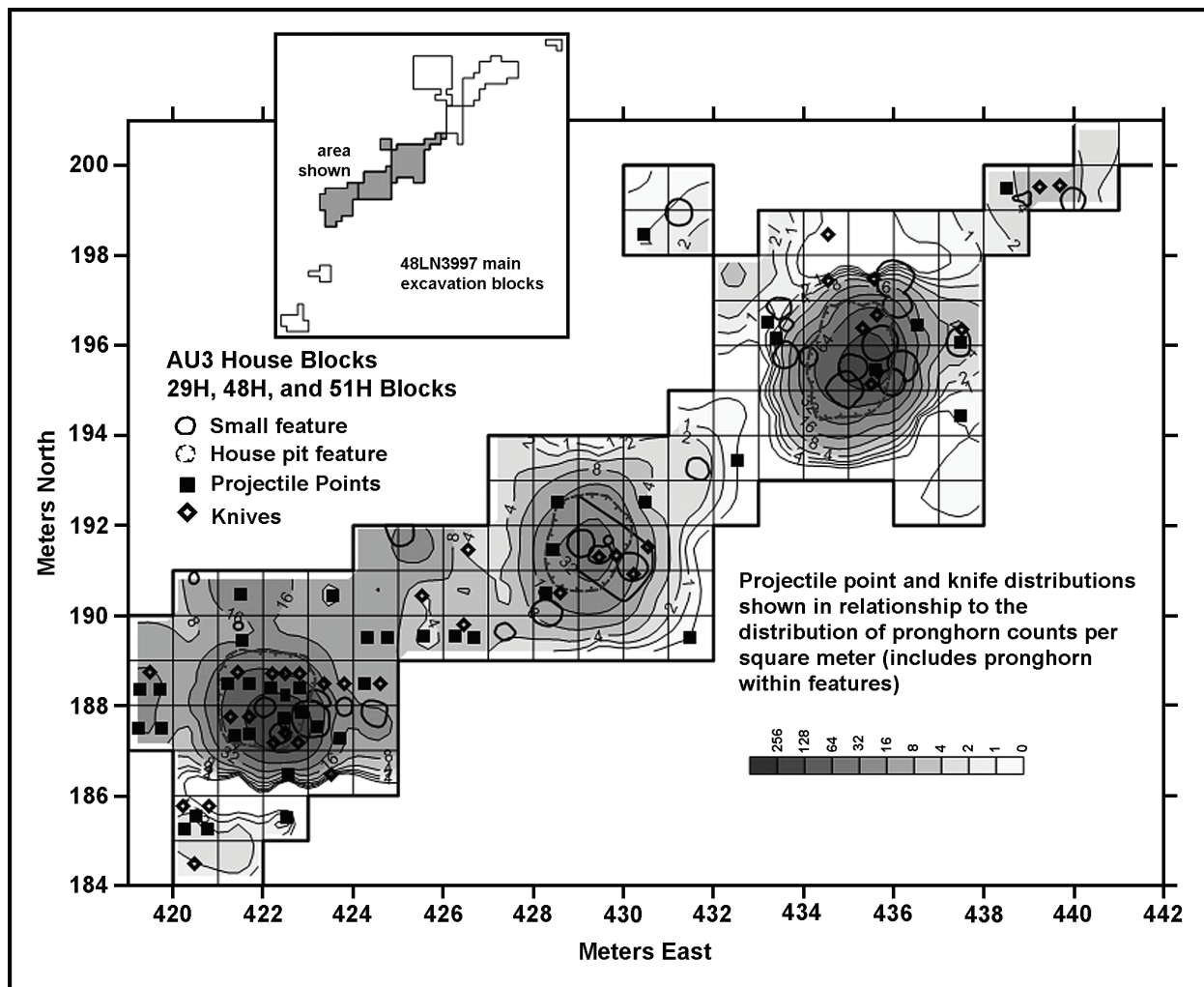


Figure 6: Map of Uinta phase component (AU3) projectile points and knives in the House Blocks in relationship to pronghorn bone.

ening of Archaic points and the wide distribution of two refits indicate Late Prehistoric hunters may have reused projectile points left behind by Archaic people as cutting or scraping tools.

Non-diagnostic chipped stone tools are geared toward cutting and scraping and, based on their location in and at the margins of the four concentrations of pronghorn debris, they were probably used primarily to butcher carcasses or for tasks related to hide preparation, marrow extraction or bone grease production. Based on the other chipped stone tool classes, which include a minimal number of pound-

ing/chopping, woodworking, graving/incising and slotting/grooving tools, a low diversity of other tasks took place within the excavated area.

Bifaces appear to have been brought to the site either as finished tools or in an already reduced state, with final manufacture, resharpening and retooling representing the primary bifacial work conducted on-site. Bifaces and flake tools are predominantly cryptocrystalline while other materials, particularly quartzite, orthoquartzite and porcellanite, were used with slightly increased frequency for expedient tools compared to bifaces. Core

reduction likely focused on the production of expedient tools.

All of the material types, except obsidian, were probably readily available as cobbles or pebbles near the site. The Bath-tub site lies less than 1.5 miles outside the defined western edge of the Blacks Fork Secondary Lithic Procurement Landscape (48LN2469) and about 1.5 miles east of the Hams Fork Conglomerate Archeological Landscape (48LN3203/48UT1885). A procurement source for Phillips Pass/Green River obsidian pebbles located in the Wyoming Basin may have provided locally available small pebbles of obsidian (Thompson et al. 1997; Wolfe and Frankus 2009). Obsidian recovered from the Late Prehistoric component includes a projectile point, one preform, one blank, one general biface, one core and 116 pieces of debitage. The small core was sourced to Phillips Pass/Green River gravels (Hughes 2015), and trade or travel to the north/northwest is indicated by four pieces of obsidian sourced to Malad, Idaho (Hughes 2015), located over 125 miles northwest of the site.

The three small house pits likely represent at least two occupations which occurred between 1270 and 1350 BP. All three houses were small, measuring approximately two meters in diameter, but were generally consistent with the morphology of other Late Prehistoric house pits in the region (e.g., Harrell 1989; Smith and Creasman 1988; Spangler 2002; Thompson 1989; Walker 1999). No direct evidence of roof materials or posts was recovered from any of the house pits but all three were likely brush structures supported by wooden posts as outlined by Shields (1998:78-79). At least one deep thermal basin was situated along the eastern, downslope edge of each of the houses (Figure 6) and may indicate the structure

was open on one side.

Tenuous hints suggesting use of the house pits during warm weather or summer come from their probable open construction, the small central hearths likely used only for light and heat with all other activities taking place outside the structure, and the presence of three charred prickly pear cactus seeds from features associated with the lower levels of the Uinta phase component (Bach 2015). Evidence relating to subsistence strategies cannot be directly associated with house occupation. All three of the house pits and most of the associated features contained pronghorn bone but faunal and tool distribution maps indicate processing activities from a later use episode took place adjacent to or on top of the house pit depressions and the abandoned house basins served as a way to contain the bone debris for disposal. No “furniture” was recovered from the floor of any of the houses and none of the recovered artifacts could reliably be associated with house occupations.

In addition to the house pits, one house-like basin and 85 small features, including large and small thermal pits with evidence of oxidation, deep and shallow basins with fire-cracked rock (FCR) and non-thermal, rock-free pits, were represented in the Uinta phase component (Figure 5, Table 4). The wide variety of feature types suggests a high diversity of activities related to pit use. The recovery of cactus processed edible tissue, cactus pad fragments and a cactus spine from flotation samples suggests at least some pits were used for roasting (Bach 2015). Although stone boiling is likely to have occurred, especially in bone grease production during pronghorn-focused use episodes, the intensity of feature construction and use over time prevented identification of feature patterning such as rock heating pits adjacent to boiling pits.

Table 4: Features in Late Prehistoric Uinta Phase Component.

FEATURE TYPE	NUMBER
House pit	3
House-like basin	1
Round-bottomed hearth	48
Flat-bottomed hearth	1
Rock-filled hearth	22
Slab-lined hearth	1
Other basin feature	3
Amorphous/Lenticular stain	5
FCR concentration	4
Sheet midden	1
TOTAL	89

Most pieces of FCR were greater than 5 cm in size and were scattered outside basins, indicating hearth cleanout did occur but pit use was not overly intensive. The heavy concentration of FCR in the northeastern-most excavation block (BT Block), where multiple intersecting features were located, points toward the area as the most

likely location for chores related to stone boiling and bone grease production (Figure 5). However, fatty acids analysis of FCR from those hearths indicate only plant and animal products were present with plant materials slightly more abundant (Malainey and Figol 2015). One notable feature (F14) in this area, apparently unique to the region, was a large rectangular basin measuring 1.28 m N/S by 1.2 m E/W by 55 cm deep. Its resemblance to a large, deep bathtub gave the site its name but its function is unknown.

Evidence of domesticity comes from the presence of bone awls and a relatively large assemblage of decorative items including stone pendant fragments, beads (Figure 7) and other ornamental items (Figure 8); bone beads and bead-making debris; a shell bead; and possible gaming pieces. Late Prehistoric people used a variety of materials to make ornaments. Some

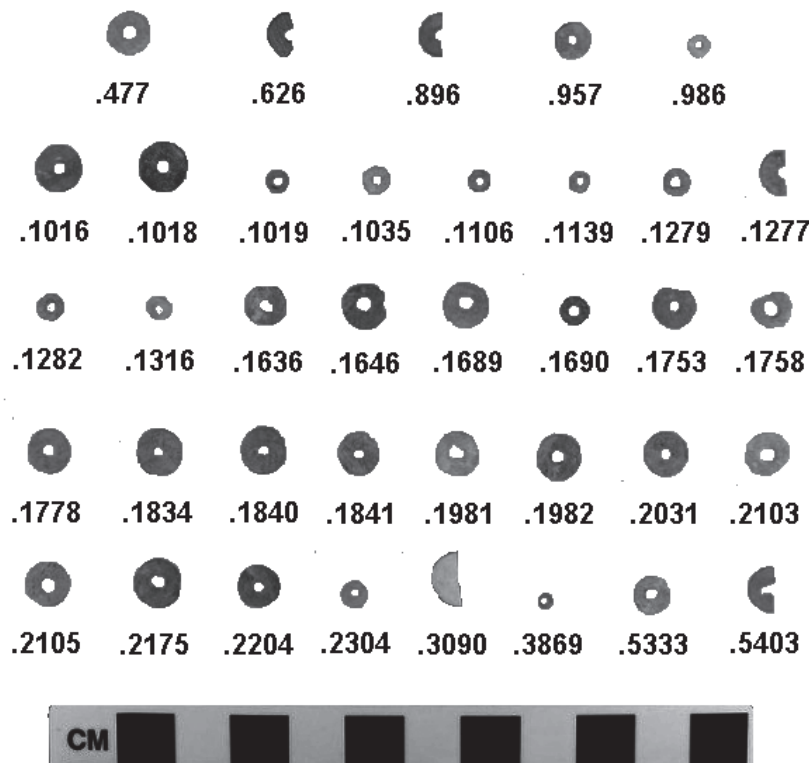


Figure 7: Type 1 stone beads recovered from across the excavations.

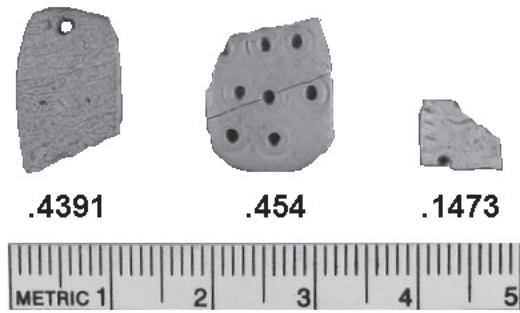


Figure 8: Sample of ornamental stone, including Uinta phase component (.454, .1473) and Archaic component (.4391) artifacts.

of the stone bead and pendant material was not identified but possible use of non-local kaolinite (Dr. Bruce Geller, personal communication 2013) for some decorative items hints at travel or trade to south-central Wyoming. Trade with groups to the west is indicated by the recovery of an *Olivella* sp. shell bead (McDonald 1994; Metcalf and MacDonald 2012; Picha 2015). This marine shell, which likely came from the Pacific or Gulf Coast, is suggestive of exchange relations with Great Basin groups to the west or Pueblo groups to the southwest (Picha 2015). Although ornamental items occur in many Uinta phase sites in the region, the assemblage at the Bathtub site appears to be larger and more varied than most others in the area.

ARCHAIC COMPONENT

Radiocarbon dates, a large pronghorn bone assemblage, one house pit and 15 small features indicate Archaic peoples also returned to site 48LN3997 several times (Figure 9, Table 5). The radiocarbon dates suggest at least three closely spaced Archaic occupations between about 4310 and 4150 BP (Table 1). The 75 sq m excavation area encompassed in the Archaic cultural component exposed a butchering and processing area which included the remains of 25 pronghorn and four fetuses.

Neither a kill site nor a residential camp associated with processing was identified; a house pit exposed at the base of excavations in the 116H Block appears to have been a remnant of an earlier occupation pre-dating the pronghorn use episode.

The distributions of pronghorn remains and chipped stone tools suggest two tightly clustered pronghorn processing loci (Figure 10). Breakage, impact fractures, cut marks and burning on the bone provide evidence of human use. Seasonality evidence comes from the presence of fetal remains suggesting animals were killed in mid-April to mid-May. A mass kill is indicated by the range of ages from less than two to over five years of age (Lee 2015).

Although the location of the pronghorn kill site is unknown, it likely was relatively close to the processing site. Crania and mandibles were recovered and suggest some pronghorn were transported whole to the processing location. However, the low frequency of phalanges and vertebrae suggest in some cases hind- and forelimbs rather than whole animals were brought to the site (Lee 2015). These different transport and butchering strategies may hint at different kill sites with variable distances from kill site to processing location.

Elk and possibly cottontail and jack-rabbit also appear to have been part of the Archaic peoples’ diets (Lee 2015), with additional evidence regarding subsistence coming from the presence of ground stone

Table 5: Features in the Archaic Component

FEATURE TYPE	NUMBER
House pit	1
Round-bottomed hearth	10
Rock-filled hearth	1
Amorphous/Lenticular stain	2
FCR concentration	2
TOTAL	16

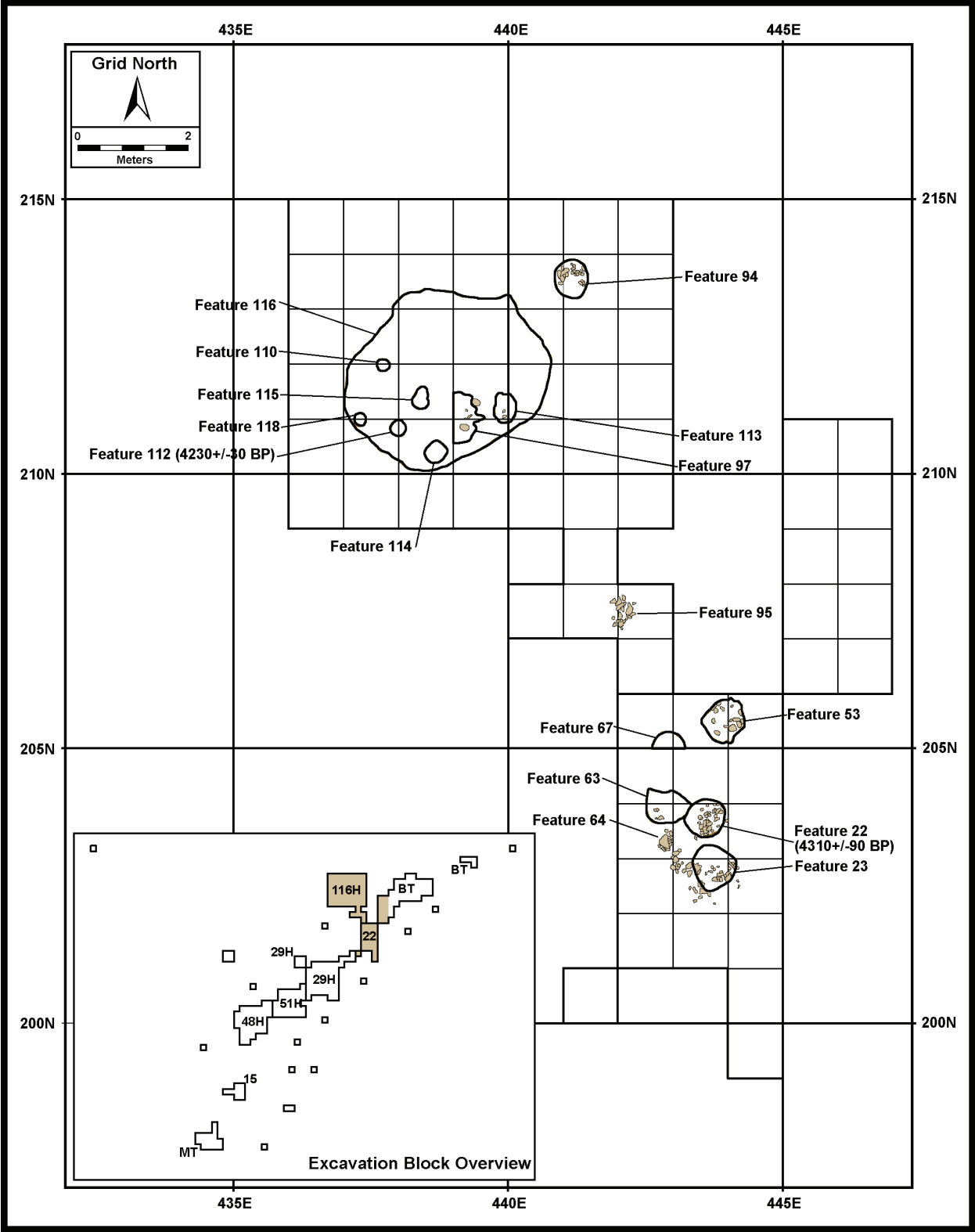


Figure 9: Archaic component excavation area and features.

tools, pollen and starch analysis, lipid analysis, and mussel shell. While ground stone tools provide circumstantial evidence for plant processing, direct evidence for the use of grass seeds, cattails, and possibly mustard came from pollen and starch analysis of three milling implements (Cummings et al. 2015). Analysis of all three tools also indicated a use for grinding charcoal. Results of fatty acids analysis on one piece of FCR also hinted at the use of hearths for seed processing (Malainey and Figol 2015). While a shell pendant fragment provides clear evidence *Anodonta californiensis* (California floater) mussel shell was used to make jewelry, unmodified shell from two additional species – (*Margaritifera falcata* [Western pearlshell] and *Lampsilis siliquoidea* [Fatmucket]) – was also present (Picha 2015). Since some mussels were readily available in nearby drainages including Little Muddy Creek (Picha 2015), it is reasonable to suggest mussel was a probable food source. The Fatmucket has not been reported west of the Continental Divide (Picha 2015) so its presence at the site could be indicative of travel or trade to the east or may suggest a change in mussel habitat over the last ca.

4,000 years.

Table 6 provides a summary of the Archaic component artifact assemblage. Ten McKean projectile points consistent with the Archaic dates were clustered in and around the pronghorn remains (Figure 10). Medium to large side-notched dart points, generally indicative of earlier Archaic occupations, also clustered among the pronghorn debris; however, evidence of reworking and resharpening of these side-notched points, as well as their distribution, is suggestive of their reuse as cutting or scraping tools after being scavenged from the remnants of earlier Archaic occupations at the site. The other chipped stone tools are geared toward cutting and scraping. Based on their proximity to the two adjacent processing locales, they were probably used primarily for butchering carcasses or for tasks related to hide preparation, marrow extraction, or bone grease production. The chipped stone tool classes also include a minimal number of pounding/chopping, woodworking, graving/incising, and slotting/grooving tools indicating a low diversity of other tasks took place within the excavated area.

All of the materials types, except ob-

Table 6: Artifacts Recovered from the Archaic Cultural Component

ARTIFACT TYPE	FUNCTIONAL CLASS	COUNT
Chipped stone	Projectile Point	25
	Biface (Stages 2-6)	55
	Flake tool/Utilized flake	77
	Cores	53
	Debitage	6,297
Non-chipped stone	Mano	5
	Metate	6
	Mortar	1
Bone implement	Awl/Needle	7
	Unidentified	3
Decorative/ Non-utilitarian	Stone pendant fragment	2
	Other shaped/modified stone	3
	Shell pendant	1

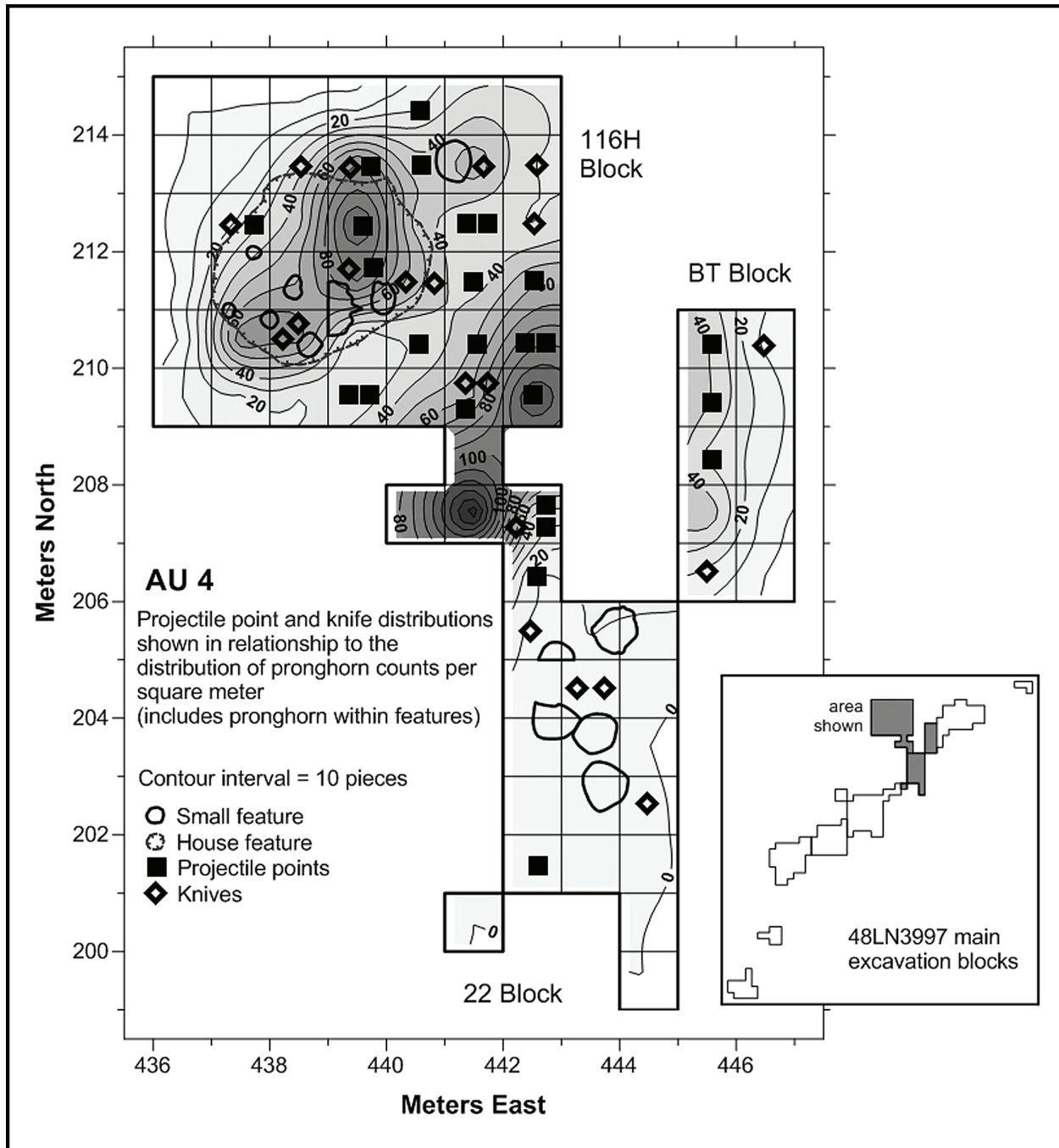


Figure 10: Map of Archaic component projectile points and knives in relationship to pronghorn bone.

sidian, were probably readily available as cobbles or pebbles near the site. Although obsidian sourced to Phillips Pass/Green River gravels might have come from a local procurement area, trade or travel to the north/northwest is indicated by

the presence of obsidian sourced to Bear Gulch, Idaho, and to Teton Pass, Wyoming (Hughes 2015), both located 125 miles or more from the site.

The Archaic radiocarbon dates straddle the transition between the Early Ar-

chaic Opal phase and the Late Archaic Pine Spring phase. Projectile points considered diagnostic of both phases were recovered from the Archaic cultural zone. Radiocarbon dates confirm the stratigraphic sequence of a house pit exposed near the base of excavations predating the intensive processing of pronghorn.

The house pit morphology is consistent with other Archaic house pits in the region (Buenger and Goodrick 2015; Pool and Moore 2011). There was no evidence of a superstructure but presumably it was a brush structure supported by posts which may have been anchored using the large boulders found scattered nearby, primarily along the northern upslope edge of the basin. The entrance may have been on the southeast-facing, downslope side. The house pit lacked a central hearth, which could hint at a summer occupation; however, the floor of the house was bedrock and a fairly large expanse of oxidized bedrock could be evidence of a fire built directly on the floor. Although several small basins were identified and excavated as possible floor features, their functions could not be determined. It is possible they were simply low spots in the bedrock where stained sediments accumulated. Evidence of domesticity comes from seven bone awls and non-utilitarian stone items recovered from the Archaic component, including from within the house pit fill; however, none could definitively be associated with occupation of the house pit. The presence of crafted ornaments such as pendants (Figure 8, Figure 11) and unaltered manuports such as fossils show jewelry was manufactured from both stone and shell but natural curiosities were also probably collected for use as ornamentation and as keepsakes.

Much of the cultural material on the house floor and in the house fill likely was

the result of post-abandonment in-filling and appears to consist mostly of debris from later use episodes. None of the cultural materials, including items often characterized as domestic artifacts or the large to medium side-notched projectile points, can definitely be associated with the house occupation, and in fact most appear to have been associated with later activities related to the processing of pronghorn carcasses.

House pit use across the region is most often associated with drier, more arid climates than the more mesic climate associated with the site's Archaic radiocarbon dates (Buenger and Goodrick 2015; Pool and Moore 2011). During more arid climatic periods, while artiodactyl populations appear to have declined, based on regional archaeofauna assemblages, rabbit use appears to have increased (Byers and Smith 2007; Lee et al. 2011; Metcalf 2011b). Rabbit remains recovered from the lower levels of the Archaic cultural zone may provide a weak association hinting at an Early Opal subsistence strategy which included rabbit.

In the Wyoming Basin, population trends for both artiodactyls and rabbits show steady increases in the Late Archaic and into the Late Prehistoric in response to environmental changes resulting from a transition from the dry and arid climates of the early to mid-Holocene to more mesic climates in the early Late Holocene (Byers and Smith 2007). Multiple researchers have linked evidence using the "artiodactyl index" and theories of higher ranked prey with regional archaeofaunal evidence (Byers and Smith 2007; Metcalf 2011b). Archaeofaunal data showing increasing preference for artiodactyls throughout the Late Archaic appear to indicate that when higher ranked animals are present, hunters consistently choose them and ignore



Figure 11: California floater mussel shell pendant.

equally abundant lower ranked prey. Project paleoenvironmental data and radiocarbon ages place the Archaic pronghorn processing use event(s) toward the end of a ca. 1,000 year period of a mid-to-late Holocene Neoglacial cooling trend (Loudnerback et al. 2015). In the face of clear evidence of the ready availability of pronghorn meat and at least some elk, there would appear to have been little need to expend time or effort toward lower ranked rabbit procurement despite their likely abundance during the same time period.

SUMMARY AND COMPARISON OF CULTURAL COMPONENTS

Use episodes at the Bathtub site dating to 4144 BP and 1220-1235 BP exhibit a subsistence strategy clearly focused on pronghorn procurement which made use of the site's location in yearlong pronghorn range and at the eastern boundary of crucial winter range (Miller et al. 1999:316). Pronghorn found in the two main cultural

components in the excavations were processed after what appears to have been mass kills which took place in the spring, as a result of communal hunts. Late Archaic peoples may have implemented a more varied transport strategy than Late Prehistoric hunters but faunal analysis generally suggests, after hunts in both phases, whole animals were transported from the kill locations to the site area for processing activities likely including butchering, marrow extraction and bone grease production, at a minimum.

Data from fauna, shell and pollen analyses indicate elk, rabbit, mussel, grass seed, mustard and cattail were other subsistence resources exploited during the Archaic period. It appears rabbits and mussels were also used during the Uinta phase occupations but evidence for the exploitation of plant resources during the Late Prehistoric occupations is largely circumstantial. Most of the ground stone recovered from the Uinta phase component were burned and fire-cracked after being repurposed in hearths, making interpretation of their original temporal context impossible. With the exception of minor evidence for plant seed oil associated with both time periods, fatty acids analyses confirmed plants were used with greater frequency in the Archaic period, but both plant and animal resources were used in both time periods.

Fifteen small features were associated with the Archaic occupations compared to 85 small features exposed in the Uinta phase component. Although differences in the number of features can be directly related to size of area excavated in each component, the diversity of feature types used during the Uinta phase occupations appears to indicate a wider variety of food preparation technologies in the Late Prehistoric than is suggested by Archaic feature types. This diversity in feature type

was largely absent in the Archaic component but could be due, in part, to preservation issues. Pronghorn remains dominate the faunal assemblage but pronghorn meat is lean and does not require extensive roasting to release nutrients (Wandsnider 1997). This may suggest the deep roasting pits were more likely to have been used to process plant resources. In contrast, the juxtaposition of FCR, wider and shallower features and pronghorn bone may represent, at a minimum, stone heating and boiling activities for the production of bone grease.

Periods of house pit occupation followed by pronghorn processing use episodes appear to have been a recurring pattern of site use through time. The Archaic house pit underlaid evidence of pronghorn processing dating to the Pine Spring phase. The house pit may reflect residential use of the site during an earlier, more arid climatic period when house pit use was more prevalent in the region and when rabbits were a dietary element. The recovered bone awls and pendants are indicative of domesticity but could not definitely be associated with the house occupation. Likewise, the three Uinta phase house pits underlaid a later Uinta phase pronghorn processing event and the bone awls and a relatively large ornamental assemblage are reflective of domesticity. However, artifacts could not be associated with discrete Late Prehistoric occupations and evidence of changes in technology is masked by the intensity of reuse of the site. Pronghorn processing in both the Pine Spring phase and the Uinta phase occurred in the spring. Evidence of house pit use in the summer is inferential and based primarily on the probable open construction of the superstructures.

Projectile points were primarily found in association with the densest concentrations of pronghorn bone. Duncan-Hanna

points were associated with pronghorn remains dated to the Pine Spring phase while Rose Spring points were found across the Uinta phase cultural component. Medium to large side-notched projectile points were found in association with pronghorn processing in both time periods. Evidence of reworking suggests these points may have been repurposed from an earlier Archaic occupation for use as butchering tools during processing episodes.

Evidence of trade or travel was more varied in the Late Prehistoric cultural zone than in the Archaic component. Obsidian from Teton Pass, Wyoming, and Bear Gulch, Idaho was the only clearly non-local material recovered from the Archaic component while Uinta phase inhabitants secured non-local *Olivella* sp. shell, obsidian and possibly kaolinite. Late Prehistoric peoples left behind small amounts of obsidian sourced to Malad, Idaho. A trade relationship with people to the west likely accounts for the presence of *Olivella* sp. shell ornaments associated with the Uinta phase. If decorative items found in the Uinta phase cultural zone were made from kaolinite, one possible procurement area is located to the east near Rock Springs.

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