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## On the Cover:

Carter Site canid manidible. See article by Burnett and Kennedy, this issue.

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# REVISITING THE CARTER SITE (48NA1425)

by
PAUL BURNETT AND JOHN KENNEDY


## ABSTRACT

The Carter site is a multicomponent prehistoric open camp located along Keg Spring Draw in the western Powder River Basin of central Wyoming. A Late Prehistoric deposit was first excavated along a terrace of the draw in 1996 before pipeline construction. Among the notable remains were hundreds of sherds of a newly identified type of ceramic ware associated with hearth-centered activities involving lithic reduction and secondary faunal processing. In 2012, SWCA Environmental Consultants revisited the Carter site for additional excavations in advance of another pipeline. Additional Late Prehistoric hearth-centered activity areas were encountered, again involving secondary faunal processing of pronghorn and bison, yet unlike in 1996, only one small ceramic sherd was recovered. In addition to the excavations, an updated recording of the site surface documented several occupations ranging from the Late Paleoindian to Late Prehistoric. Combined, these investigations demonstrate that the site was repeatedly occupied throughout prehistory. The Late Prehistoric hearth-centered activity areas buried in the terraces adjacent to the draw are indicative of repeated occupations by small groups using the area as a base for encounter-based hunting and gathering.


## INTRODUCTION

The Carter site (48NA1425) was originally recorded in 1987 as a prehistoric open camp with a likely buried component, and a portion of the site was excavated in 1996 before construction of the Express pipeline. Most notably, these excavations revealed a Late Prehistoric occupation that included fragments of three ceramic vessels of a ware that had not been previously identified in the area (Martin 1999a, 1999b, 2000). In 2012, SWCA Environmental Consultants (SWCA) excavated another portion of the site in advance of the Denbury Greencore pipeline, which was constructed parallel to the Express pipeline. Additional Late Prehistoric material was exposed in these excavations, which is the focus of this paper. While buried hearth-centered campsite remains were again encountered, only one small ceramic sherd was recovered.

## BACKGROUND AND SETTING

The Carter site is located on the southwest margin of the Powder River Basin, on Keg Spring Draw, which is a tributary of the South Fork of the Powder River (Figure 1). Open rolling plains sagebrush steppe with a patchy distribution of medium and low sagebrush is accented by low-lying forbs, bunchgrasses, and sedges in the floodplain. The south-trending draw meanders through the central portion of the site. The drainage is spring-fed and often holds pockets of water. Keg Spring Draw currently flows intermittently from snowmelt and rain. Vegetation in the drainage bottom is thick, lush grasses and sedges, giving way to the more typical xeric mixed sagebrush community in the uplands. First and second alluvial terraces (T1 and T2) border the draw. The T1 on the west side of the draw has been the focus of excavations (Figure 2). On the east side of the draw, sandstone bedrock has limited the extent of the T1 to a narrow strip between the floodplain and the steep T2 riser immediately east. The soils range from alluvial silty loam in the drainage bottom to aeolian sand and slope washed colluvium overlying alluvium on the terraces and toeslopes of the surrounding uplands. Deflated hard pans are common on the terraces, particularly on the T2, and artifacts exposed in these deflation areas demonstrate that the buried archaeological deposits are limited to the aggraded sediment patches that are concentrated along the draw.

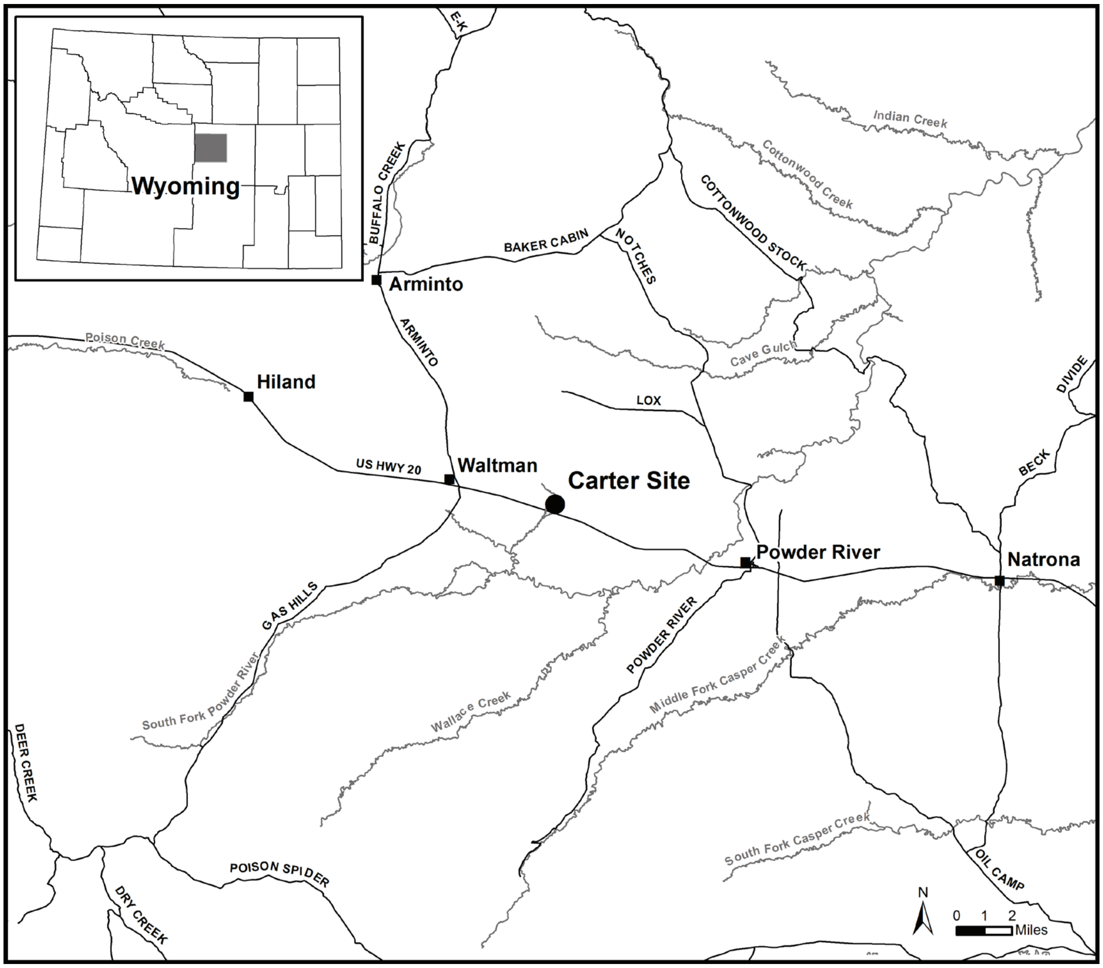


Figure 1: Carter site location in central Wyoming.

The site area has been impacted by modern disturbance. A stock dam borders the site to the north, and that location is frequented by cattle, horses, and pronghorn. An east-trending fence is located near the north site boundary. Cattle branding is conducted annually to the north of this fence in the draw. South of this fence, the land is used for grazing cattle and horses. A large east-trending transmission line is part of the utility corridor that contains at least four pipelines. There are also a few two-track roads adding to the disturbance in the site.

Powers Elevation originally recorded the site in 1987 for the Elk Basin pipeline, which was not constructed. The surface assemblage was described as containing a dispersed scatter of around 1,000 flakes, one side-notched Early Archaic projectile point, and one broken sun-colored amethyst glass bottle. During analysis of the 2012 SWCA efforts at the site, this projectile point was subjected to discriminant function analysis (Thomas 1978; Knight and Keyser 1983; Shott 1997), which returned all seven values for arrow, and given its morphology, it more likely dates to the Late Prehistoric Firehole phase rather than the Early Archaic. Three shovel tests were excavated in 1987; one west and two east of Keg Spring Draw. These tests demonstrated a complex alluvial sequence. One flake was recovered from the shovel test on the west side of the draw.

Mariah Associates (now TRC) returned to the site in 1993 for the Express pipeline project, which followed the originally proposed Elk Basin route. Eight 1- by 1-meter (m) test units and 14 auger probes were excavated along the proposed centerline spanning the backslopes, toeslopes, and terraces on both sides of Keg Spring Draw. The only positive auger test, Probe 13 on the west toeslope above the draw, yielded three fragments of butchered large mammal bone between 40 and 60 centimeters (cm) below surface (cmbs). Two of the eight 1- by 1-m test units produced cultural material. Both were on

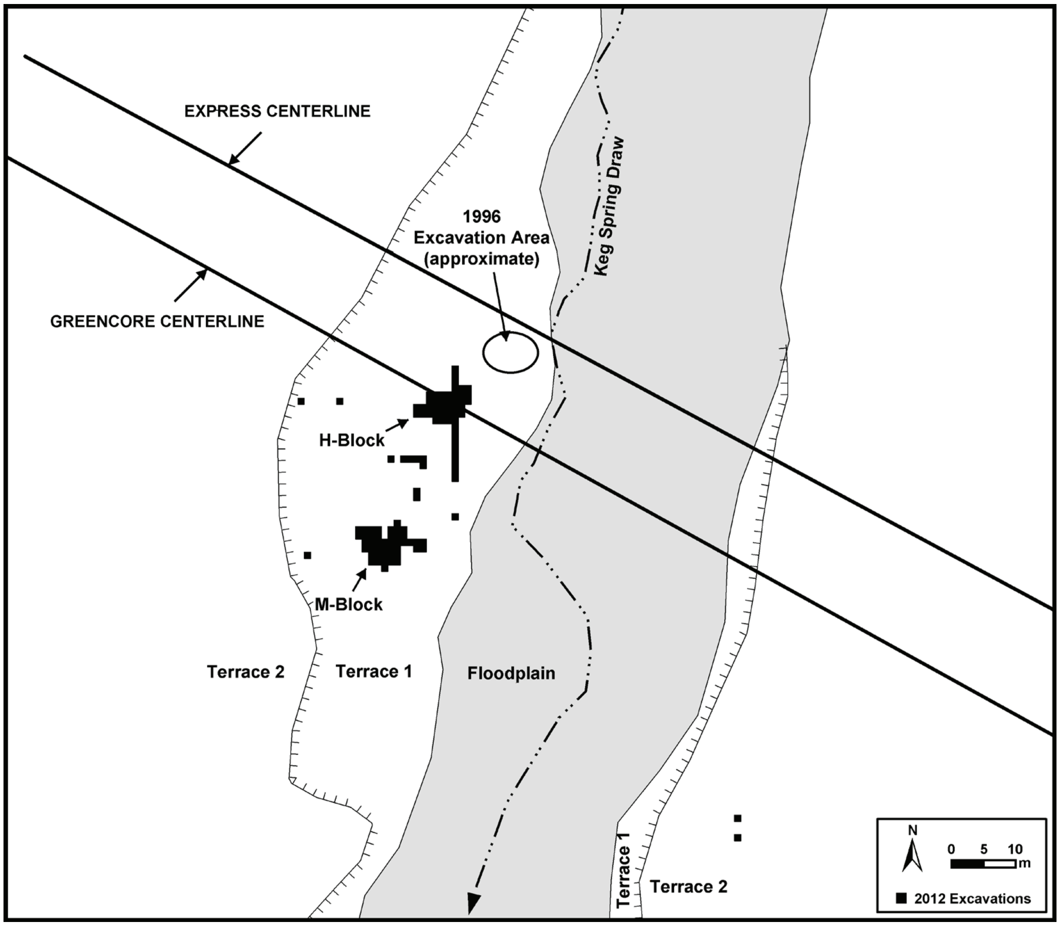


Figure 2: Excavation areas along Keg Spring Draw.

the west side of the draw. TU7 produced one flake, and TU5 yielded a butchered bone and flakes. The items recovered from TU5 indicated the presence of an in situ cultural horizon between 30 and 50 cmbs. Soil was described as alluvial sandy loam. Based on these results, formal excavations were conducted in March and April 1996 (Martin 1999a, 1999b, 2000).

These excavations encompassed 94 1- by 1-m units focused around TU5. The block was excavated to depths of 30 to 100 cmbs. A shallow basin hearth (Feature 1) was excavated, which was associated with a dense scatter of artifacts indicative of hearth-centered activities. These included 535 ceramic sherds, 5,265 flakes, 11 projectile points, 5 cores, 20 bifaces, 17 modified lithics, 1 clay bead or pipe fragment, and 2,258 faunal remains (Martin 2000). The historic component was expanded to include a few cans and a cartridge case from the surface of the block. The projectile points recovered are corner-notched, side-notched, and un-notched types typical of the Late Prehistoric period. The ceramics include pieces from at least three vessels. Martin (2000) noted their similarity to Uncompahgre Brown Ware most commonly associated with the Ute. Faunal remains included deer, bison, pronghorn, and a possible wolf/dog hybrid. The hearth produced a radiocarbon date of 580 ± 60 radiocarbon years before present (B.P.) (Martin 2000).

Mariah conducted open trench inspection (OTI) during construction of the Express pipeline in 1997, but no additional cultural material was encountered. Metcalf Archaeological Consultants (Metcalf) returned to the site in 2010 for the Greencore Class III inventory, which paralleled the Express pipeline to the south (Jennings et al. 2011). Several flakes were noted on the surface. Metcalf excavated 38 auger probes: 33 along the proposed centerline at 10-m spacing spanning the site boundary as defined in 1987, and 5 between the proposed Greencore centerline and the 1996 excavation block. Although no cultural material was recovered, the auger testing did reveal soils similar to those identified during the 1996 excavations. The testing further demonstrated the shallow nature of residual deposits on the backslopes above the alluvial deposits alongside the draw. Based on the high potential for deposits near the draw, Metcalf recommended excavations to be conducted before construction of the Greencore pipeline. SWCA conducted these excavations from May 26 to July 13, 2012. An updated surface inventory was conducted as well. While the focus here is on the Late Prehistoric deposit encountered in the excavations, a brief summary of the surface inventory is provided.

## SURFACE INVENTORY

The updated surface inventory nearly tripled the boundary from less than 10 hectares to over 26 hectares and resulted in a newly identified hearth feature, stone circle, five artifact concentrations, nine temporally diagnostic projectile points ranging from Late Paleoindian to Late Prehistoric (Figure 3), 64 modified lithics, a sizeable debitage assemblage, and additional historic artifacts. Two obsidian artifacts were collected from the surface for geochemical source characterization. One small flake has a trace element composition characteristic of the Malad, Idaho, source, 270 miles southwest (Hughes 2014). The second is an edge-damaged flake exhibiting polished dorsal flake scars indicative of long-distance transport. Hughes (2014) sourced this obsidian to Obsidian Cliff in Yellowstone National Park, which is 215 miles northwest.

The expansion documented artifacts and features encircling the original boundary around the west, south, and east. To the west, artifacts were observed upslope and along the drainage margins. A significant portion of the expansion was the number of features, lithic concentrations, and dispersed lithic artifacts on the upland plains above the south and southeast sides of the draw.

Feature 1 is the hearth excavated by Mariah in 1996. Feature 2 is a deflated hearth located on the upper western terrace (T2). It consists of a 35-cm-diameter circular dark gray stain with charcoal flecking and 16 pieces of fire-altered rock (FAR). Feature 2 is within lithic concentration 1 (described below), which is on the west terrace above Keg Spring Draw, 65 m south of the excavation blocks. The upper terrace in this area is characterized by the aforementioned deflated hardpans and low vegetation density. Two scrapers are within 10 m of this feature.

Feature 3 is a stone circle on the upland plain above the south bank of the draw within the expanded southwest site area. It consists of 86 tabular sandstone cobbles in a slightly irregular circle measuring 6.0 m north/south by 5.5 m east/west with no discernable gaps between the stones. Cobbles range in size from 5 to 30 cm in diameter. Sodding is shallow, and lichen growth on exposed surfaces ranges from 30 to 70 percent.

Many stone circles are known to lack lithic artifacts and ancillary features (Banks and Snortland 1995). At Feature 3, 32 flakes are on the surface within the circle. Material types include red-maroon quartzite (n = 15), tan chert (n = 7), gray quartzite (n = 5), off-white chalcedony (n = 3), and tan silicified sediment (n = 2). The debitage is small, with 30 of the flakes less than 30 millimeters (mm) and only two between 30 and 40 mm. Most of the flakes lack dorsal cortex. Only two contain less than 50 percent cortex, and one has over 50 percent cortex.

A secondary feature is associated with the stone circle. It is a discontinuous, irregular circle measuring 3.8 m in diameter and is directly adjacent to the southeast side of the main circle. The cobbles comprising this secondary feature are noticeably smaller than those representing the stone circle. Gaps are present in the northeast, east, and southwest quadrants. It is unclear if these gaps are part of the origi-

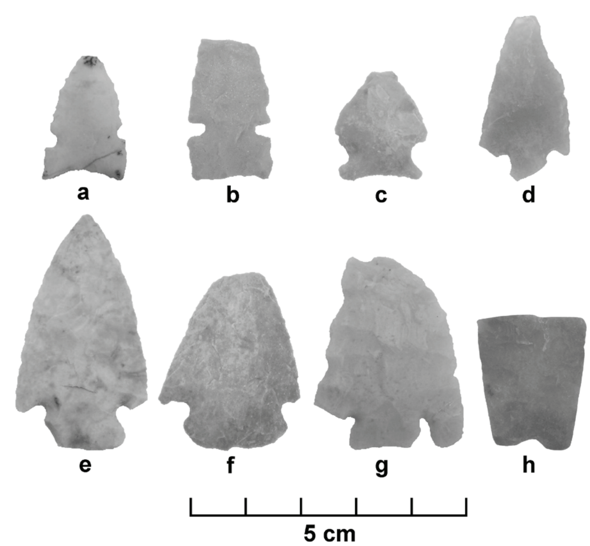


Figure 3: Projectile points from the Carter site surface (a–d: Late Prehistoric; e and f: Late Archaic; g: Middle or Late Archaic; h: Late Paleoindian).

nal construction design or the result of disturbance. While we do not attribute any specific function to this feature, secondary features have been credited to many functions. Henry and Thompson (1897:382) observed on their visit to a large Cheyenne encampment that "beside each large tent is a smaller one which appears to be used for cooking, preparation of meat, dressing leather, etc." Banks and Snortland (1995:132) observed ancillary features, some that could include surface cobbles, such as drying racks, shade structures, sweat lodges, hide processing areas, and miniature tipis. Kehoe (1960:434) notes that small tipis placed closely to larger ones could be for widows, elderly people, or children's play areas. Similarly, Campbell (1915:692) referred to miniature tipis as "play house(s)" for little girls. Zedeño et al. (2014:37) interpret ancillary features as indicators of unenclosed, outdoor activity areas. Schaeffer and Schaeffer (1934) report that double rings typically functioned as lodges for polygamous households, and in large village settings as lodges for society leaders and special feasting occasions.

## 2012 EXCAVATION OVERVIEW

SWCA excavated 107 1- by 1-m units in 2012 and exposed additional Late Prehistoric hearth-centered activity areas similar to those encountered in 1996. Although voluminous ceramics such as those previously excavated were not present in the 2012 blocks, excavations did recover a robust lithic and faunal assemblage associated with at least three thermal features. Several units either lacked cultural material or contained only minimal amounts. To focus on the activity areas with significant research potential, SWCA concentrated on two excavation blocks. The H-Block includes 37 units, and the M-Block includes 44 units.

All units were excavated in 1- by 1-m units aligned on the Universal Transverse Mercator (UTM) grid, North American Datum (NAD) 1983, Zone 13. Averaged Global Positioning System (GPS) unit proveniences collected from submeter Trimble units were used to establish site datums, and a subcentimeter total station was used to mark the excavation unit corners and elevation datums. Units were named following an alpha-numeric system referencing 25- by 25-m blocks (with a letter), followed by nested 5- by 5-m blocks referenced with a number (e.g., A1). Within each 5- by 5-m block area, 25 1- by 1-m units were referenced by individual numbers, similar to sections within the public land survey system (e.g., A1-1). Excavation elevations also followed the UTM elevations in meters above sea level, to the nearest centimeter. Level forms were filled out for each 10-cm unit level, and these detailed the nature of the unit surface and subsequent strata, along with notable details regarding excavation methods/implements used, sediments, artifact and charcoal distribution, features, and disturbance. Features were excavated separately from the adjacent levels, and bone and flaked stone artifacts from each level, unit, and feature were kept in separate bags.

While the detail of unit level mapping varies predictably between each excavator and excavation technique, general methods were standardized. To make a compromise between mapping detail and excavation speed, all flaked stone and bone over 2 cm in maximum length was point plotted when identified in situ. Given that excavation procedures included combinations of shovel shaving and troweling, not all items meeting this length criteria were mapped, but attempts were made to do so. All FAR over 5 cm was mapped in each level. Certain charcoal fragments were mapped, but because of the density of charcoal in areas, there was no deliberate attempt to systematically map these pieces unless they were unusually large or were being collected for further analysis. Site stratigraphy was mapped along contiguous excavation units to support site-wide profile sketches. A solution of 1 N Hydrochloric Acid (HCl) was used to assist in the profiling by identifying pedogenic carbonate accumulations through effervescence tests.

All excavated sediment was screened, predominantly through ¼-inch hardware cloth. All faunal and flaked stone fragments were collected from the level screens. Feature fill was screened through ⅛-inch mesh, while samples of feature fill were floated and water screened. No prehistoric macrobotanicals were produced from the flotation. Certain sediment samples were retained to assist in pedon descriptions. FAR was counted and weighed per level, and was subsequently discarded. Various other samples were collected for analyses, including feature samples for floating, charcoal for radiocarbon dating and plant identification, and obsidian for x-ray fluorescence (XRF) source characterization.

## DEPOSITIONAL SETTING

Laws and Eckerle (1988) completed a geoarchaeological analysis of the Carter site as a part of the Express pipeline project in 1996. SWCA updated this analysis based on the deposits encountered during the current project (Figures 4 and 5).

Stratum I: the oldest unit encountered by SWCA, consists of massive, moderately sorted yellow silty sand with patches of mottled clay, mottled with white carbonate inclusions. This stratum is interpreted as alluvium and is comparable to Stratum II in Laws and Eckerle (1988).

Stratum II: grayish brown to reddish silty clay with patches of humus and pedogenic calcium carbonate filaments and nodules. Comparable to Stratum III in Laws and Eckerle (1988), the depositional environment is slope wash.

Stratum III: very dark brown to black massive silty clay with patches of very fine-grained sand. The peds are predominantly massive with a sharp contact with the underlying stratum. Pedogenic calcium carbonate filaments are common. This stratum is comparable to Stratum IV in Laws and Eckerle (1988), and the depositional environment is slope wash. This unit underlies the main cultural deposit.

Stratum IV: grayish brown massive silty clay to fine-grained sand. This depositional unit is interpreted as a combination of slope wash and aeolian sand, and is comparable to the lower portion of Stratum VI in Laws and Eckerle (1988). This stratum lacks pedogenic calcium carbonate and represents the lower portion of the main cultural deposit.

Stratum V: compact, massive grayish brown clay loam comparable to the middle portion of Stratum VI in Laws and Eckerle (1988). This stratum lacks calcium carbonate and is interpreted as primarily reflecting a slope wash deposit and represents the middle portion of the main cultural deposit.

Stratum VI: in the northern portion of the SWCA excavations, this stratum consists of loamy brown to gray sand. This stratum is interpreted as primarily aeolian in origin in the H-Block. In the southern excavation area, this stratum is more silty. This stratum lacks calcium carbonate. Overall, this stratum is comparable to the upper portion of Stratum VI in Laws and Eckerle (1988), which they interpret as a mixture of slope wash and aeolian sediment. This unit and the overlying stratum contain the upper portion of the cultural deposit.

Stratum VII: in the northern portion of the SWCA excavations (H-Block), this stratum is overburden from the Express pipeline. In the southern

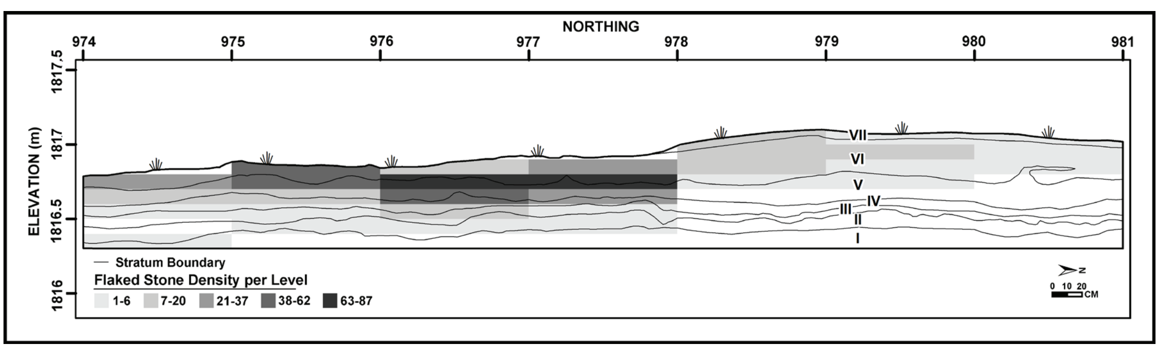


Figure 4: East wall profile of H-Block.

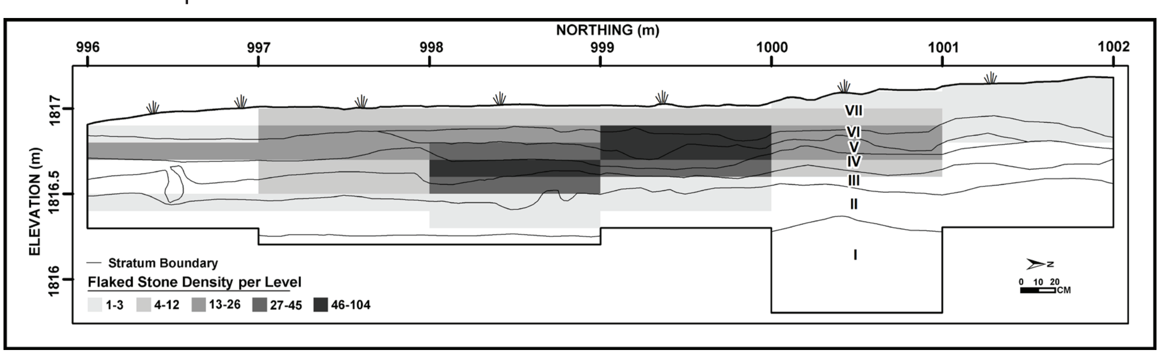


Figure 5: East wall profile of M-Block.

portion (M-Block), this horizon is characterized by brown sandy loam that is interpreted as primarily aeolian in origin. This is comparable to Stratum VI in Laws and Eckerle (1988).

In the compact clayey deposits of the lower cultural stratum, post-depositional movement from trampling should be minimal. Eckerle et al. (2011) have summarized research on the churn zone context as it relates to a variety of depositional settings in the region. Clayey fine sand substrates have an expected churn zone of less than 3 to 8 cm. The profiles of the main blocks (see Figures 4 and 5) depict artifact density and show in general the vertical distribution of artifacts tends to extend across 40 cm, in Strata IV through VI. While this represents an over-thickened cultural deposit, there is no other evidence suggesting multiple stratified occupations in the excavation blocks. The presence of a younger occupation directly north of the excavation blocks (excavated in 1996) is the only supporting evidence to suggest that multiple occupations may be present. Bioturbation is evident in the excavation blocks, mainly via roots and krotovina, but this is not extensive and does not explain the over-thickened cultural horizon. The current interpretation of the 2012 excavation blocks is that discrete occupations are present and are associated with the hearths in the blocks, which were dated between 700 and 900 B.P. This vertical distribution is considered further in the Spatial Patterns section below.

## FEATURES

As noted, three thermal features were encountered during the 2012 excavations. Two, are in the M-Block (Features 4 and 5) and one is in the H-Block (Feature 6). Features 4 and 5 are small, shallow basin hearths lacking complex structure and containing little FAR. They are associated with lithic artifacts and pronghorn and bison bone. Feature 6 is a large roasting pit or earth oven containing large numbers of FAR and pronghorn remains. Radiocarbon dates from the three features are presented (Table 1).

### FEATURE 4

Feature 4 is a small, semi-circular, dish-shaped hearth located 18 cmbs (Figure 6). It measures 30 cm in diameter and is only 7 cm deep. The feature fill is dark gray with fairly abundant charcoal flecking. No FAR is associated with Feature 4 and no lithic artifacts were recovered from the feature fill. Flotation of the hearth fill recovered 45 small faunal fragments, 16 of which were burned (n = 3) or calcined (n = 13). Additional lithics and faunal remains were recovered in proximity to the hearth and are described in detail in various sections below. The feature produced two radiocarbon dates: 870 ± 30 B.P. and 1014 ± 24 B.P. The latter date is from whitebark or limber pine and may represent old wood. It is not clear if this feature was minimally excavated at the time of occupation and was intentionally shallow or if it was deflated after the occupation.

Table 1: Radiocarbon Dates

| FEATURE | B.P. | LEVEL | NORTHING | EASTING | ELEVATION | SAMPLE | LABORATORY # | MATERIAL | Δ$^{13}$C (‰) |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 870 ± 30 | 2 | 978.9 | 936.4 | 1,816.85 | M19-9 | Beta-365698 | Unidentified charcoal | -24.30 |
| | 1014 ± 24 | 2 | 978.9 | 936.4 | 1,816.85 | M19-9 | PRI-13-128-NA1425M199 | Whitebark or limber pine charcoal | -22.02 |
| 5 | 740 ± 30 | 2 | 979.05 | 932.4 | 1,817.05 | M20-3-5 | Beta-365699 | Unidentified charcoal | -24.50 |
| | 870 ± 26 | 2 | 979.0 | 932.4 | 1,817.05 | M20-3 | PRI-13-128-NA1425F006 | Sagebrush charcoal | -23.95 |
| 6 | 780 ± 30 | 3 | 998.34 | 941.18 | 1,817.02 | H23-9-7 | Beta-365697 | Unidentified charcoal | -22.60 |
| | 800 ± 30 | bulk | 997.4 | 941 | bulk | F6 Bulk | Beta-365696 | Unidentified charcoal | -22.60 |
| | 880 ± 25 | 6 | 997.57 | 940.45 | 1,816.82 | H23-11-26 | PRI-13-128-NA1425H231 | Whitebark or limber pine charcoal | -22.62 |
| 1 | 580 ± 60* | N/A | N/A | N/A | N/A | Feature 1 | Beta-101653 | Unidentified charcoal | N/A |

* From 1996 excavations.

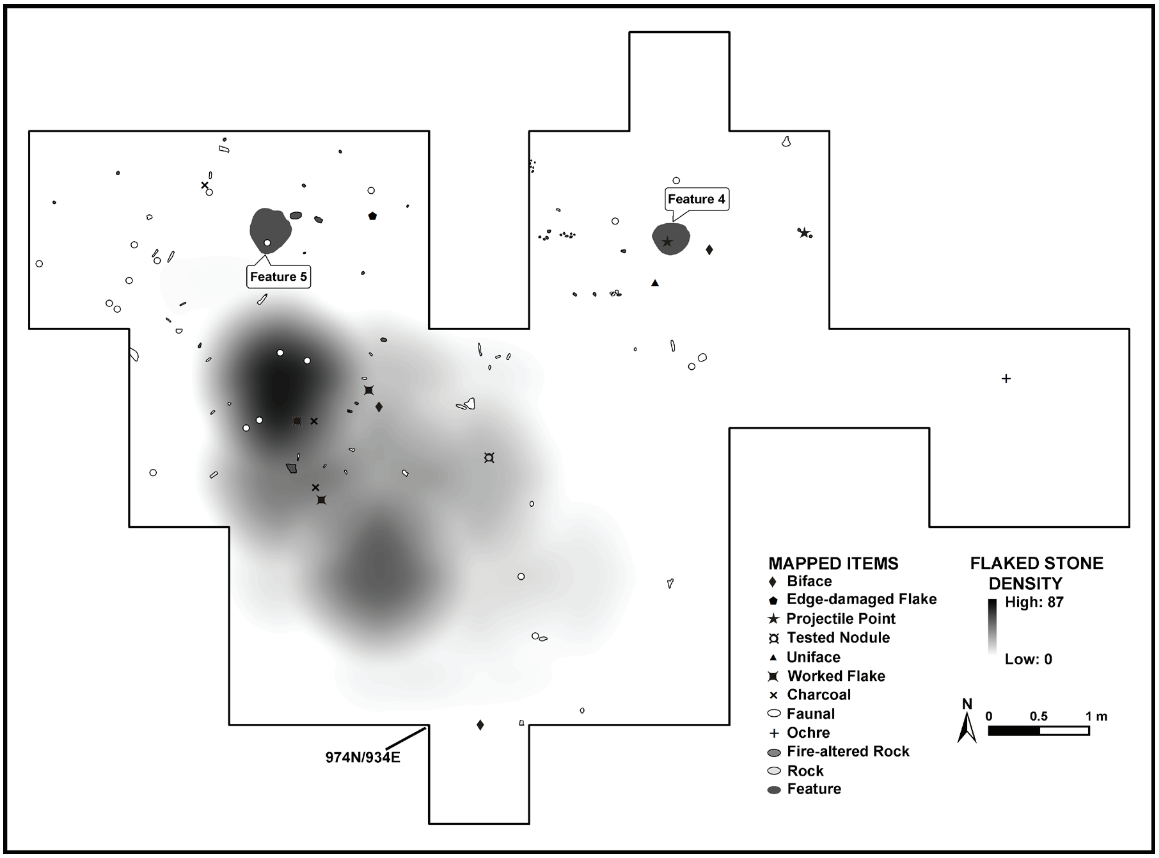


Figure 6: M-Block plan view with flaked stone density.

**FEATURE 5**

Feature 5 is located 4 m west of Feature 4. This is a small, round, basin hearth encountered at 22 cmbs (see Figure 6). It is 47 cm in diameter and 12 cm deep. A fairly robust oxidation rind is present around the feature, indicating the feature experienced sustained temperatures. Three pieces of locally available sandstone FAR are associated with the feature. One small fragment was within the feature, while two were outside the feature at the same elevation as the feature top. No lithics were recovered from feature fill, although a number were recovered adjacent to it, as discussed in more detail below. One unspecified burned bone fragment was recovered with ⅛-inch screening of fill, while flotation produced 49 bone fragments, four of which are burned and seven of which are calcined. A medium artiodactyl metapodial was recovered immediately adjacent to the hearth. Notable rodent disturbance was mapped within and next to the feature. Feature 5 produced two radiocarbon dates: 740 ± 30 B.P. and 870 ± 26 B.P. The latter date came from charcoal identified as sagebrush. As is the case with nearby Feature 4, it is not clear if this feature was minimally excavated at the time of occupation and was intentionally shallow or if it was deflated after the occupation.

**FEATURE 6**

Feature 6 consists of a large, cobble-lined earth oven encountered 31 cmbs (Figures 7 and 8). It is 25 cm deep and is slightly oblong, measuring 95 cm north/south by 82 cm east/west. The walls of the basin are fairly steep. A thick black band of large charcoal fragments and stained soil lines the base. This band is capped with large sandstone cobbles. Overlying the cobbles is largely unstained sediment with intermittent charcoal in a discontinuous band 5 to 10 cm above the cobbles. Many pronghorn elements rested on the cobbles. The upper extent of the feature showed a distinct dark band around the perimeter, while the interior was characterized by only sparse charcoal flecking. A robust oxidation rind was present around the entire feature, indicating high and/or sustained cooking temperatures. West and north of the feature were expansive gray ash

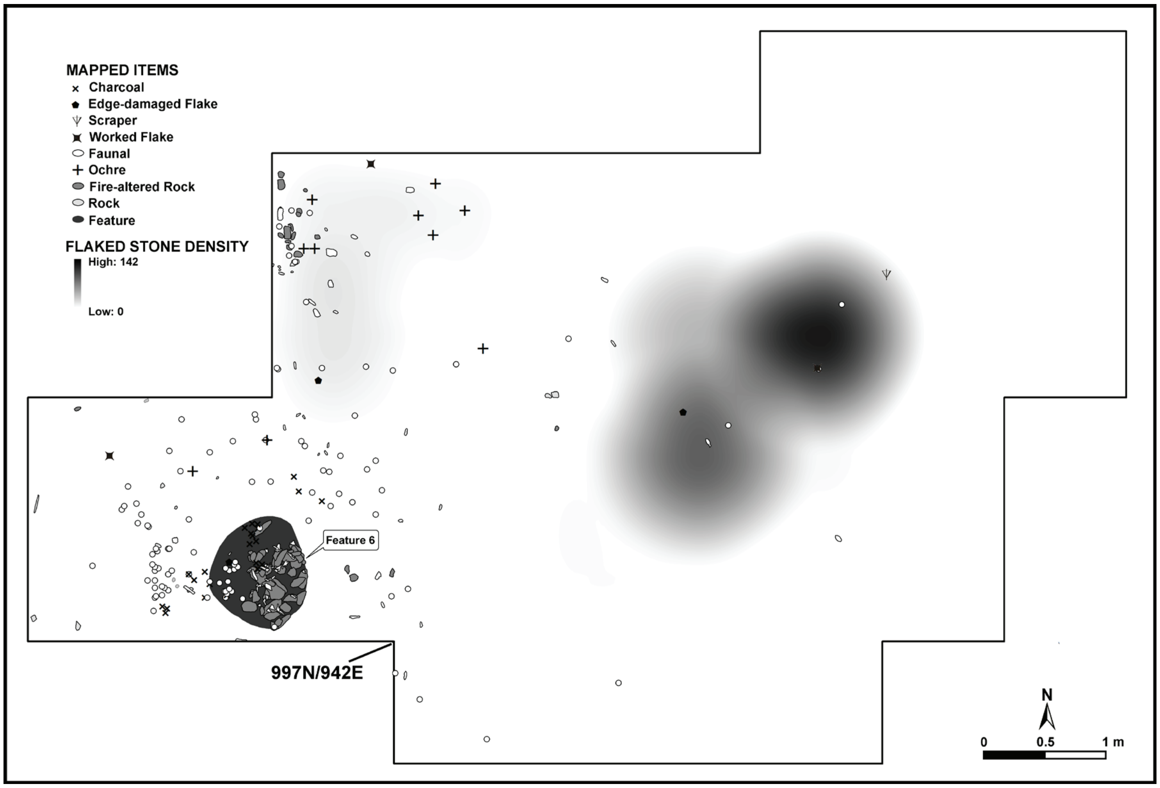


Figure 7: H-Block plan view with flaked stone density.

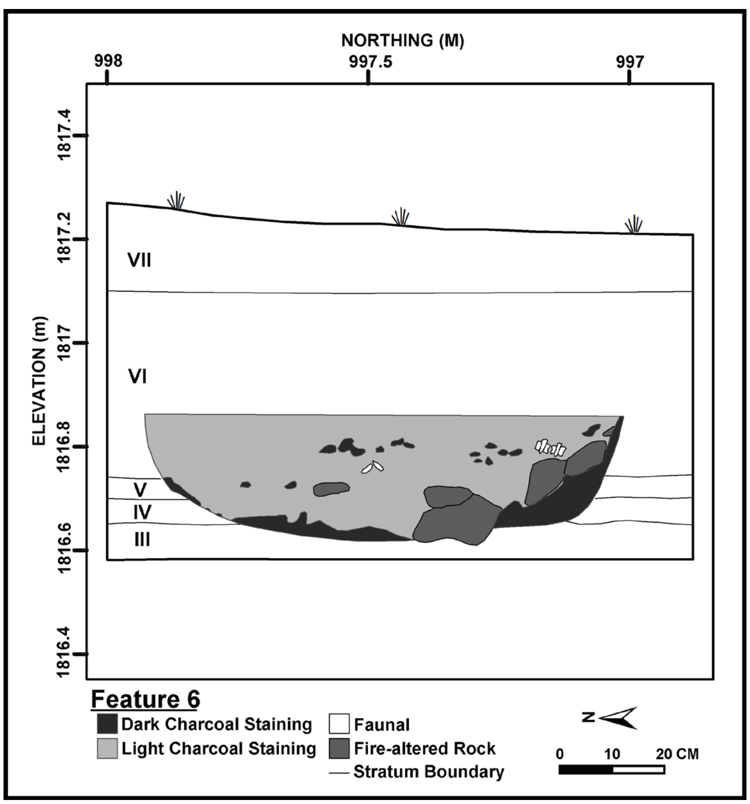


Figure 8: Feature 6 profile.

stains measuring upwards of 1 m away from the feature. These stains were shallow, ranging between 2 and 3 cm in depth with the bottom contact diffuse. Lithics and faunal remains were recovered from the Feature 6 area, and are discussed in more detail in various sections below. As is detailed below, 54 faunal remains were mapped within the feature, an additional 131 were recovered during feature fill screening (⅛-inch mesh), and flotation of samples from both Feature 6 and the outlying stains produced an additional 447 items. Only 21 of the 185 items mapped or recovered from ⅛-inch screening are heat altered, while almost half of the small fragments recovered from flotation are burned or calcined. The feature produced three radiocarbon dates: 780 ± 30 B.P., 800 ± 30 B.P., and 880 ± 25 B.P. The latter date came from a sample identified as either whitebark or limber pine.

The construction of Feature 6 closely matches examples of earth ovens reported by Black and Thoms (2014). It appears a hot fire was burned to create a deep bed of hot coals. Large cobbles were layered over the coals to regulate the temperature and slow the cooling process. Pronghorn anatomical units in varying stages of disarticulation were laid on the cobbles, possibly surrounded by vegetal matter, and then the hearth was capped by sediment. After a lengthy cooking time, the cap of sediment (and possibly vegetation) was removed, revealing the roasted meat. Dump out of the capping sediment and removal of the animal units would have dispersed the ash and charcoal. As the meat was cooked by heat from coals rather than open flames and the bones were protected by muscle masses, few of the bones show evidence of heat alteration. Meat was consumed, marrow extracted after flesh removal, and non-meaty elements, including articulated joints, appear to have been placed back in the feature, presumably as part of activity area clean up. This scenario of earth oven cooking closely matches the structure, residue, and faunal record associated with Feature 6.

## FLAKED STONE

The lithic assemblage from data recovery at the Carter site has the potential to address the following research questions.

1. What was the activity area structure as it relates to lithic reduction?
2. What was the organization of lithic technology? What strategies were used to extract and manipulate the toolstone?
3. What insight into the regional settlement system structure is offered from the lithic sample?

While a few projectile point fragments were excavated during data recovery, these are too fragmentary to contribute meaningfully to interpretations of time periods represented, bow and arrow technology, or regional affiliation. No ground stone or hammerstones were excavated.

The lithic assemblage from the 2012 excavations includes 1,417 items. This total includes 62 microflakes recovered from feature fill water screening. To avoid sample bias from the smaller screen sizes used in the feature fill screening, these microflakes are excluded from analyses that estimate the distribution of flaked stone both in planview and vertically through the profile. The distribution of flaked stone is considered primarily across the two excavation blocks (H and M) (see Figures 6 and 7). A small amount of flaked stone was identified in the units extending away from these blocks, and these are included in assemblage-wide estimates. The H-Block has one primary locus of flaked stone (see Figure 6), but less dense loci around Feature 6 and in the northwest corner of the excavation block are also described. The most notable lithic concentration in the M-Block has a relatively broad concentration south of Feature 3 (see Figure 7), but the lighter concentration around Feature 4 is also considered. Summary data are useful for the entire blocks; however, for purposes of estimating activity area functions, these loci are more useful than the aggregate data. Lithic remains are discussed as follows: minimum analytical nodules, debitage, and modified lithics. Spatial patterns are detailed later in the paper.

### RAW MATERIALS AND MINIMUM ANALYTICAL NODULE ANALYSIS

The availability of toolstone heavily influences procurement and use decisions. Where resources are abundant, there is arguably no need to economize use, and expedient technologies can be successful adaptations (Bamforth 1986; Kelly 1988). In contrast, use in resource-poor environments or use by mobile groups crossing areas with unknown resource availability should have stimulated economizing behavior through the use of curated technologies. Further complicating matters is the anticipated need for certain technologies, which may produce discordant assemblages given the nature of local toolstone availability.

While several interacting factors would have influenced prehistoric decisions regarding lithic technology, such complex decisions can begin to be researched by following two avenues (Sellet 1999:15). First, lithic reduction activities are reconstructed at the site level to understand what types of toolstone were manipulated and to determine or estimate the end product of this reduction. Second, tools that were produced elsewhere but that were deposited in the site or concentration are identified.

These research avenues are facilitated by nodule analysis, where attempts are made to isolate the debris from each nodule that was reduced on the site (Kelly 1985; Larson 1992, 1994; Larson and Kornfeld 1997; Sellet 1999). Rather than recording each range of attributes in a raw material type classification, minimum nodules provide a single category in which to place the variation that may be present. Nodules, while they can be individual cores, are best visualized as analytical constructs that allow for the quantification of variability in an assemblage (Larson and Ingbar 1992; Larson 1994). Raw materials, even those originating from the same geologic formation or outcrop, can have a range of variability. This variability can include differences in texture, inclusions, color, and cortex characteristics. Nodules are defined according to raw material, as well as similarities in the aforementioned variables (Larson 1994).

While advocates of this technique indicate that physical artifact refitting should be included in nodule analysis whenever possible, refitting is not necessary to gain significant information from the technique. Given the amount of time and experience required to successfully conduct a refit analysis, it was not feasible for this project. This analysis is based on the premise that each defined nodule represents the by-products of a single piece (e.g., a core or blank) that was transported to the archaeological site where it was recovered (Larson and Kornfeld 1997). Nodule analysis therefore theoretically allows for the approximate identification of individual production events. For example, when a nodule includes only a single tool, it may have been introduced from another location and not subjected to maintenance at the site. Nodules containing only single flakes require more evaluation. A single large flake could represent a tool blank while a smaller flake may be representative of a single episode of resharpening (Larson and Kornfeld 1997). In contrast, multiple-item nodules provide more information about tool and site use. A multiple-item nodule including only debitage suggests that an item was produced and/or maintained at the site, but carried elsewhere for use. Alternatively, a multiple-item nodule containing debitage, as well as a discarded tool product, is indicative of production, use, and discard at the site (Larson and Kornfeld 1997). Examining spatial patterns of multiple-item nodules allows researchers to delineate the locations of production versus those areas designated for use (Larson 1994; Larson and Kornfeld 1997).

Raw material types were determined by macroscopic analysis of mineralogy, color, and opacity. When possible, estimations of the geological formation of certain raw material types are offered. For purposes of this analysis, these selected nodules are examined in further detail as representative samples of multiple-item nodules. In several instances, single nodules are represented by multiple cores or worked cobbles with associated debitage, indicating that clearly more than one nodule is represented. Still, because these materials are visually indistinguishable, they are treated as a "virtual nodule" in the sense that their reduction trajectories are assumed to be similar.

Considering only artifacts recovered from the excavations and not those documented on the surface, 1,417 pieces of flaked stone were recorded. These were grouped into minimum analytical nodules for analysis. Of the 38 analytical nodules documented at the site, only 10 contain more than 10 pieces of debitage. Three of the nodules with more than 10 pieces of debitage are chert (including Phosphoria and Bridger or Green River chert), five are metaquartzite, one is orthoquartzite (Morrison Quartzite), and one is porcellanite (Miller 2010). In addition to the Obsidian Cliff and Malad obsidian identified on the surface, two pieces excavated from the Late Prehistoric horizon were characterized as material from Obsidian Ridge, New Mexico, and another artifact was identified as black non-volcanic glass from Powder River, Montana (Hughes 2014).

By far, the assemblage is dominated by a fine- to medium-grained opaque white quartzite with occasional orange and gray mottling (nodule 1). This comprises 74 percent of all lithics at this site, and it overwhelms the sample when comparing the characteristics of one nodule against another.

Of the 1,417 pieces of flaked stone, 95 percent is debitage, which tends to be the dominant artifact type in nodules that contain more than one artifact. Cores are rare in this assemblage. There is only one non-bifacial core fragment and one tested cobble (discussed below). Bifaces are more common and include 11 artifacts, most of which are in an early stage of reduction. The dominant nodule 1 also dominates the biface assemblage, which suggests while some cores were undoubtedly reduced on site and transported elsewhere, most of the lithic reduction was focused on bifaces.

Several nodules are represented by single artifacts (n = 16). Most (n = 11) are represented by only one piece of debitage. Of the remaining five, one is represented by a tested cobble, one is a biface, and three are projectile point fragments. This supports the interpretation that some of the points were made elsewhere with nodules not represented in this data recovery assemblage. Twelve nodules contain more than one but less than 10 artifacts. These tend to be represented by a few pieces of debitage and worked flakes or other informal tools. None of the nodules with more than one item and less than 10 items include a projectile point. Aside from the three projectile points in single-artifact nodules, there are two point fragments from the most common quartzite nodule (nodule 1), one from the dominant chert nodule (nodule 2), and another from a quartzite nodule represented by 33 artifacts (nodule 15). These points are more likely to have been manufactured on-site.

Exterior cortical material is not common on artifacts from the Carter site. Of the 1,417 pieces of flaked stone excavated, only 59 (5 percent) retain cortex. Magne (1989) demonstrated that cortex is rapidly removed from a nodule during lithic reduction, and considering the low amount of cortex in this assemblage, most of the early stage reduction involving the removal of cortical material appears to have been done elsewhere. This low percentage, in combination with the lack of informal cores and the presence of early and mid-stage bifaces, suggests that most nodules reduced were initially reduced elsewhere and brought to the site primarily as early stage bifaces for further reduction.

Nodule 1, the dominant nodule, is represented by only 21 of the cortex-bearing artifacts (2 percent), including an early stage biface end, two worked flakes, and 18 pieces of debitage. Nodule 2, the most common chert nodule, is represented by 11 cortex-bearing artifacts (19 percent), all of which are flakes. One exhibits a blocky platform indicative of early stage amorphous core reduction. Chert nodule 3 is Phosphoria (Miller 2010), most likely procured from the Bighorn Mountains to the north, and it is represented by seven cortex-bearing artifacts (29 percent) including the only amorphous core fragment. Of the 40 artifacts in nodule 10, which is similar to Bridger formation or Green River formation chert, nine (22.5 percent) contain cortical material. These include worked flakes and debitage, some of which retain characteristics of biface reduction. Morrison quartzite (nodule 6) is represented by three pieces of cortex-bearing debitage (14 percent), and similar orthoquartzite defined by Miller (2010) as porcellanite derived from weathered volcanic material is predominantly represented by cortex-bearing artifacts (5 of 7). This material was most likely procured locally. A worked flake from this nodule exhibits characteristics of mid-stage biface reduction. Cortex occurs sporadically on several other nodules, notably including the single flake representing nodule 46, which was derived from a cobble of Powder River nonvolcanic glass (Hughes 2014). Given the low amount of cortex on the dominant nodule, it seems likely that the source material was nearby and that it may represent a primary source area where the material was quarried from rock faces, rather than being derived from river cobbles that contain a large amount of cortex per cubic centimeter.

**DEBITAGE**

Debitage is the by-product of core reduction and tool maintenance and manufacture. Flakes are those objects showing a clear ventral surface that have no evidence of modification (Bamforth 1991; Magne and Pokotylo 1981). Angular debris is defined as irregularly shaped debitage lacking a definable ventral surface. Both flakes and angular debris comprise the debitage sample. The mineralogy, colors, and opacities were recorded for all debitage, along with an estimate of the presence of dorsal cortex. The presence or absence of thermal damage (e.g., crazing, potlidding, and thermal fractures) was noted for each item. Finally, the maximum length of each item was recorded to the nearest tenth of a millimeter. Flake size can be used as an indicator of reduction stage, in that flakes tend to become smaller in later stages of reduction and tend to become more uniform in biface reduction (Callahan 1979; Stahle and Dunn 1982).

To examine trends in the reduction trajectories of different raw material types at the site, we compare the debitage lengths of those raw material types that are represented by at least 10 pieces of debitage. If certain raw materials are initially reduced on site, the flake size distribution should be significantly larger than a raw material that is only reduced in late stages such as final tool production. Eight nodules contain at least 10 pieces of debitage, and these can be grouped into four mineralogical categories: chert, metaquartzite, orthoquartzite, and porcellanite (Figure 9).

Most debitage size distributions are skewed, with a large proportion of small pieces and fewer large items. Shapiro-Wilk tests for normality are used to determine if the debitage size distribution is normally distributed, where a small p-value indicates distributions are not normally distributed (Table 2) (Royston 1982). Only orthoquartzite is somewhat normally distributed, in that the skew in their debitage lengths was not significant enough to reject the null hypothesis that the data are normally distributed. The remainder are sufficiently skewed

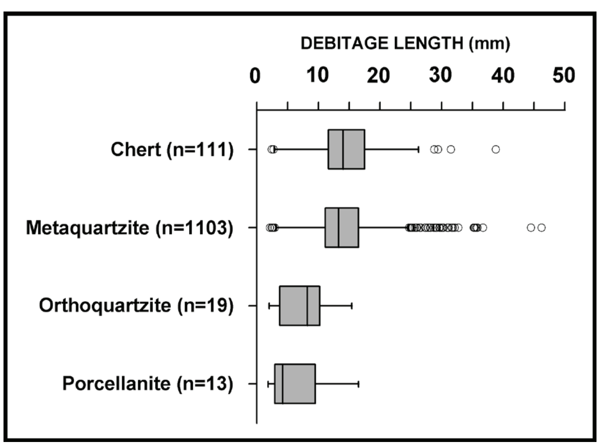


Figure 9: Differences in debitage length of chert, metaquartzite, orthoquartzite, and porcellanite for all nodules with over 10 pieces of debitage.

to not be normally distributed. Given these skewed distributions, the non-parametric Mann-Whitney U tests are used to statistically evaluate the differences in these lengths across material types (Sawilowsky 2007). The null hypothesis in this test is that the two samples being compared are the same. Identical samples would have a probability value of 1. The alternative hypothesis is that one sample tends to have larger values than the other. Significantly dissimilar samples would have a probability value approaching 0. For example, if the size distribution between two raw material types produced a probability value of 0.05, that would imply a 95 percent likelihood that the samples are not the same.

The Mann-Whitney tests indicate that the size ranges between the chert and metaquartzite nodules are not significantly different from each other (Table 3), and the orthoquartzite and porcellanite also are not significantly different. However, the debitage size distributions of both the chert and metaquartzite are significantly larger than both the orthoquartzite and porcellanite (Table 3). This difference is driven in part by the 10 orthoquartzite microflakes and nine porcellanite microflakes that were recovered from feature fill by water screening. These make up a large proportion of the total debitage samples for these material types. Given these small sample sizes for the latter two material types, perhaps the most notable aspect of the flake size distributions is that even though there are only 111 chert flakes from nodules with over 10 items, their size distribution does not vary significantly from the 1,103 metaquartzite flakes. This suggests that similarly sized nodules may have been reduced for related purposes. For example, if chert was dominated by retouch or finishing flakes on late stage tools, compared to early and mid-stage metaquartzite biface reduction, then the flake sizes would vary significantly.

Comparing the cortex values between cherts and metaquartzites, 21 percent of the cherts with at least 10 items in a nodule contain cortex, while only 2 percent of the metaquartzites retain cortex. Given this fairly large difference, one possibility is that the chert nodules were more locally available and were brought to the site in an earlier stage of reduction than the metaquartzite. They retained more of their unmodified exterior surface; but another possibility as mentioned above is the source distances for the two may not be significantly different, and the

Table 2: Statistics Comparing Raw Material Debitage Lengths

| VALUE | CHERT | METAQUARTZITE | ORTHOQUARTZITE | PORCELLANITE |
|---|---|---|---|---|
| Number of values | 111 | 1,103 | 19 | 13 |
| Sum | 1,613.8 | 15,764.4 | 143.4 | 73.4 |
| Minimum | 2.4 | 2.1 | 2 | 1.8 |
| Maximum | 38.8 | 46.2 | 15.4 | 16.5 |
| Range | 36.4 | 44.1 | 13.4 | 14.7 |
| Mean | 14.5 | 14.3 | 7.5 | 5.6 |
| Median | 14 | 13.3 | 8.2 | 4.2 |
| Standard error | 0.6 | 0.2 | 1.0 | 1.2 |
| Standard deviation | 6.3 | 5.1 | 4.3 | 4.2 |
| Skew | 0.6 | 1.4 | 0.3 | 1.7 |
| Shapiro-Wilk p-value | 0.0032 | <0.0001 | 0.1338 | 0.0083 |

Table 3: Mann-Whitney U Test Correlation Matrix for Debitage Lengths from Different Mineralogies (p[same])

| | Chert | Metaquartzite | Orthoquartzite |
|---|---|---|---|
| **Metaquartzite** | 0.2469 | | |
| **Orthoquartzite** | 0.0001 | 0.0001 | |
| **Porcellanite** | 0.0001 | 0.0001 | 0.2268 |

metaquartzite was quarried from a source which had less cortex to begin with, such as a rock outcrop, as compared to a secondary chert cobble source. Regardless, the reduction trajectories for the two materials were similar at the site in that they were producing similarly sized flakes.

Several flakes were identified as having diagnostic attributes of biface thinning flakes. Biface thinning flakes typically exhibit an isolated, faceted, and lipped platform; platforms retaining a dulled bifacial edge; curved longitudinal cross-sections; diffuse bulb of force; and feathered flake terminations (Frison 1968; Root 1992:83; Andrefsky 1998:118). These include two chert nodules, four metaquartzite nodules, and one porcellanite nodule. While other nodules may have been bifacially reduced, these were notable.

## MODIFIED LITHICS

The modified lithics sample includes 70 artifacts: 11 bifaces, 1 amorphous core, 45 modified flakes (21 edge-damaged and 24 worked), 7 projectile point fragments, 2 scrapers, 1 tested cobble, and 3 unifaces. Two of the uniface fragments conjoin into a refit, indicating the original uniface was broken during or after shaping. This assemblage consists predominantly of informally worked (or edge-damaged) items presumably intended for expedient use, rather than being part of a curated strategy focused on anticipated need and efficient lithic reduction.

## BIFACES

Not including projectile points, 11 bifaces are included in the data recovery sample. One is too fragmentary to assign a reduction stage. Seven are mid-stage biface fragments, and three are late stage biface fragments. Two of the late stage biface fragments are broken refits located in the same level, 2.5 to 3.0 m apart.

The mid-stage biface fragments include five from the dominant metaquartzite nodule 1 (two refitting), one from a gray metaquartzite nodule, and one from a silicified sediment nodule. The refitting mid-stage biface from nodule 1 includes one large biface fragment near Feature 4 and a broken refitting fragment 3.7 m southeast in the large M-Block lithic concentration. Aside from this refitting biface, the remaining mid-stage bifaces are highly fragmentary, retaining little of the morphology of the parent specimen. These mid-stage bifaces are presumably the parent material for most of the debitage and most of the expedient tools (e.g., modified flakes). No amorphous cores are present from nodule 1, yet there are several mid-stage biface fragments from this material, and debitage from this material by far dominates the sample.

The three late stage bifaces are all metaquartzite. Two are small fragments retaining edge portions. One is a larger lateral fragment that was broken during excavation. As all of these late stage bifaces are fragmentary, they appear to have been discarded after breaking during reduction. Earlier stage biface reduction may have been geared toward the production of expedient tools, as is seen in the large sample of modified flakes for example, and as the biface thinned and useable flakes could no longer be obtained, the bifaces may have been worked into tools themselves, such as the projectile points present in the sample. These late stage bifaces appear to have been on this trajectory.

**CORES**

One amorphous core and one tested cobble are the only nonbifacial core-type artifacts recovered during the recent excavations. Both exhibit informal opportunistic flaking and they lack symmetry or extensive platform preparation. They appear to have been expediently used and discarded before being exhausted of useable flakes. As such, they do not appear to have been intended for extended use.

The core fragment closely resembles the Phosphoria formation chert as described by Miller (2010). This core is multi-colored with a gray interior that grades to banded orange, red, and purple toward the exterior. White inclusions are present throughout. This core retains less than 50 percent cortex. Three flakes of this material are in the immediate vicinity of this artifact, and a low density of debitage associated with this nodule (n = 23) was identified across the excavation areas.

The tested cobble is maroon to red mottled orthoquartzite. The artifact retains over 50 percent of the original cobble cortex and has four flake scars. The cobble has one slightly battered edge that is suggestive of a chopper tool. No artifacts are associated with this cobble, further suggesting it may have had uses other than being a source of flakes.

**MODIFIED FLAKES**

Modified flakes include both those that are only edge-damaged and those that exhibit intentional flaking that do not fit into a more formal category such as scrapers and unifaces. Of the 45 modified flakes in the data recovery assemblage, 21 are edge-damaged and 24 are worked. A selective sample is detailed here. Many are small fragments and do not exhibit sufficient detail to warrant additional discussion.

One Morrison quartzite edge-damaged flake is located in a lithic concentration near the center of the H-Block. This artifact exhibits edge damage on both lateral and distal margins. This flake exhibits sharp edges and is a sufficient size to have been used as an expedient knife. Another edge-damaged flake that may have functioned as an expedient knife is located directly northeast of Feature 5. This flake is from the dominant white metaquartzite nodule. Of the 21 edge-damaged flakes in the data recovery assemblage, 12 are from this nodule. This artifact exhibits consistent edge damage across both lateral margins. Six modified flakes were made from what appears to be Green River or Bridger formation chert (Miller 2010). Three retain less than 50 percent dorsal cortex, and given this amount of cortex, the material was likely procured relatively nearby. Four of these modified flakes exhibit sharp modified edges suggestive of use as knives, while two are unifacially retouched to produce a steep edge angle reminiscent of informal scrapers.

The remaining modified flakes are smaller, more fragmentary and otherwise similar to the aforementioned artifacts. They typically exhibit consistent edge damage or flaking across one or more margins and appear to have been damaged from use as expedient knives, scrapers, and spokeshaves. Edge grinding/platform preparation during lithic reduction may have caused some of these modifications as well, and post-depositional trampling is another potential source of edge damage. Microwear studies could potentially identify the cause of some of these modifications.

**PROJECTILE POINTS**

Seven fragmented projectile points were recovered during the 2012 data recovery. As described above, several more were identified on the site surface, but only those exposed during excavation are discussed here. Three of these are only tips, but are assumed to be from projectile points based on size and shape. One tip was recovered from an isolated test unit, and two were adjacent to Feature 4. While highly fragmented, the remaining four projectile point fragments contain diagnostic information with regard to size and possible temporal affiliation (Figure 10).

One Late Prehistoric side-notched point (Figure 10.a) was recovered from the block of four units in the center of the excavation area (see Figure 2). No dated feature is in the vicinity to provide further information regarding temporal association. The point was made from quartzite, and considering the moderate amount of debitage associated with

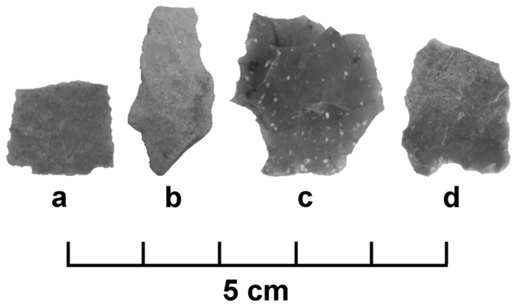


Figure 10: Diagnostic projectile points recovered from 2012 excavations.

this nodule, it may have been made on site. Lacking the base, the point cannot be reliably assigned to a particular type, but considering the right angle of the shoulders and a neck width of 7.6 mm, it appears to be associated with the latter part of the Late Prehistoric and may be a Plains Side-Notched point (Kehoe 1966).

Another Late Prehistoric side-notched arrow point (Figure 10.b) was recovered in the cultural layer immediately northwest of Feature 6. The projectile point is missing both proximal and distal ends; however, considering the overall shape, size, and the neck width of 8.2 mm, the point can be confidently assigned to the Late Prehistoric period. This is presumably related to the activities around Feature 6, which was dated to 880 ± 25 B.P. and 780 ± 30 B.P. Produced from nodule 1, this point may have been made on site. Side-notched arrow points typical of this time period include a range of side- and corner-notched projectile points generically termed Prairie Side-Notched (Kehoe 1966). These post-date corner-notched Avonlea and Avonlea-like points and pre-date Plains Side-Notched points which exhibit more square basal edges.

One projectile point was located immediately south of Feature 4 (Figure 10.c). Thermal fractures have removed most edges of this artifact, and while the general outline is recognizable as a projectile point, temporal associations are difficult to ascertain. The edges of the neck are not intact, but considering its overall size, it does seem too large to be a Late Prehistoric point, and it more closely resembles Late Archaic points. However, because of its direct association with Feature 4, which was dated to 870 ± 30 B.P. (and the errant date of 1014 ± 24 B.P. which is assumed to be from old wood), the artifact appears to be associated with the Late Prehistoric occupation. The raw material of this artifact is not associated with other lithic material in the excavations, and it may have been produced elsewhere and brought to this site as a finished tool.

Another projectile point associated with Feature 4 was recovered 2 m south of the hearth, again in the same strata as this Late Prehistoric feature (Figure 10.d). While fragmentary, the base is intact and has a neck width of 12.4 mm. The basal morphology is reminiscent of a McKean lanceolate such as some at Mummy Cave Layer 30 (Husted and Edgar 2002:Plate 24). However, given the condition of this artifact and the damaged edges, this interpretation is not definitive. The point is directly associated with additional flakes and faunal fragments typical of the Late Prehistoric cultural horizon.

**SCRAPERS**

Aside from the possible expedient scrapers classified as modified flakes, two more formal scrapers were recovered. One was from the northeast portion of the H-Block, and the second was from an isolated test unit in the center of the site. The H-Block scraper is similar to the many modified flakes associated with the dominant quartzite nodule (Figure 11.a). However, the artifact exhibits an abrupt (nearly 90-degree) angle along a consistently worked edge, which set this artifact apart from the modified flakes. This scraper is similar to the modified flakes in other attributes such as the irregular, unshaped edges and overall expedient design. The worked scraper edge exhibits minimal retouch and probable signs of use wear. Both lateral margins exhibit notches that may have either functioned as spokeshaves or supported a hafting element, but considering the irregular outline of the remainder of the margins, hafting seems unlikely.

The second scraper is fairly formal (Figure 11.b), especially considering the predominantly expedient, informal design of the remainder of the modified lithics. This scraper exhibits a uniformly worked steep edge angle with uniform lateral margins leading from the scraper edge to the platform of the original flake. The analytical nodule is represented by this and only one other artifact—an edge-damaged flake. Given the lack of associated material, it is tempting to suggest that this artifact was brought to the site as a curated tool, but considering that this scraper was excavated from an isolated test unit, it is not possible to ascertain if

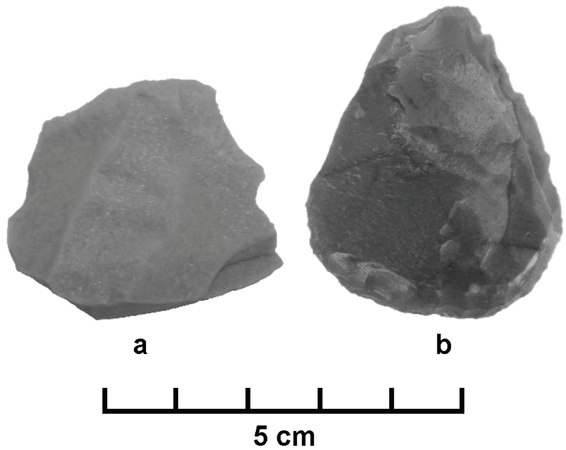


Figure 11: Scrapers recovered from 2012 excavations.

this nodule was associated with additional flaking debris. Given the overall outline and uniformity of the lateral edges, this may have been hafted to a shaft, but there is no direct evidence such as ground edges to support this interpretation.

**UNIFACES**

Two unifaces were recovered in 2012; however, these are categorized as three artifacts because one small fragment was located in an M-Block unit and is a broken refit to a larger medial fragment in an adjacent unit. These units are south and southwest of Feature 4. The toolstone is a brittle white metaquartzite with a few black inclusions. It is not as highly metamorphosed as the dominant nodule 1, but it is otherwise similar in appearance. It exhibits continuous edge working along the dorsal surface of the flake, but the edges are not extensively retouched and are somewhat irregular. This appears to be an expedient uniface broken either during manufacture or shortly thereafter.

The other is an informal uniface fragment northwest of Feature 6 in the H-Block. This uniface is made from dark purple silicified sediment, which is a raw material also represented by a mid-stage biface fragment and a flake in the same unit, another piece of debitage in the unit to the west, a flake within Feature 6 fill, and three other pieces of debitage located elsewhere in the H-Block and M-Block. While this uniface lacks cortex, a flake in the same unit and another in Feature 6 retain over 50 percent dorsal cortex, indicating that this nodule was in the early stages of reduction. Given the apparently poor quality of this stone, the uniface may have broken while being reduced.

**FIRE-DAMAGED FLAKED STONE**

Only 10 artifacts in the 2012 data recovery sample exhibit signs of thermal damage. Six are in the northern portion of the M-Block, scattered between Features 4 and 5; three are in isolated test units; and one is located in the unit northeast of Feature 6 in the H-Block. The most notable burned artifact is the aforementioned projectile point (Figure 10.c), which may have been burned within Feature 4. Experiments by Buenger (2003) indicate that sustained temperatures exceeding 350 degrees Celsius (°C) (660 degrees Fahrenheit [°F]) produce this type of fracturing in chert. The tested cobble exhibited minor signs of thermal damage, as did a projectile point tip and a small biface fragment. The remainder of the burned artifacts are debitage.

**FLAKED STONE CONCLUSIONS**

The lithic assemblage from the 2012 data recovery at the Carter site reflects a predominantly expedient technology, but a few curated items are present. Aside from the projectile points, arguably the only formal tool is a scraper (Figure 11.b). Other curated tools are evident in single- or few-item nodules represented only by flakes that do not match others in the assemblage. This includes the two pieces of obsidian debitage with geochemical signatures from Obsidian Ridge, New Mexico, and the non-volcanic glass from southern Montana. However, because the non-volcanic glass flake retains cobble cortex that is indicative of early stage reduction from a secondary cobble source, the precise provenance of this toolstone source is unclear.

Nearly all of the modified lithics are expedient modified flakes, a few of which were modified to an extent to warrant them being designated unifaces or scrapers. Considering the number of mid-stage bifaces and the near lack of amorphous cores, along with the low percentage of cortex-bearing artifacts, most of the toolstone appears to have been procured from a source that was distant enough to warrant the production of bifacial cores and “gearing up” at the source. While several sources are represented, by far the most common is the white metaquartzite represented by nodule 1. Other notable sources include the aforementioned obsidian and non-volcanic glass, and the Phosphoria from the Bighorn Mountains. Aside from the distantly sourced obsidian, the costs of transporting most of the toolstone to the site do not appear to have been significant enough to limit the production of expedient flake-based tools that were discarded after minimal modification. Several of the bifaces were broken and discarded at this site as well. Given the number of biface fragments and informal tools, it appears that the cost of replenishing toolstone was relatively low.

While there are only a small number of projectile points, a couple appear to have been made elsewhere, being brought to the site in final condition (see Figures 10.c and 10.d). Others are tied to nodules that are also represented by lithic reduction debris and may have been produced onsite (see Figures 10.a and 10.b). The broken condition of all of the points suggests they were discarded after being no longer functional, in a campsite setting where tools were being maintained. The projectile point tips may have arrived at the site in meat packages, since it is unlikely that they would have been broken during hunting episodes within the camp. While too fragmentary to conclusively determine temporal affiliation, one has a morphology similar to Late Archaic points (see Figure 10.c) and another bears a resemblance to McKean lanceolates (see Figure 10.d), yet both were located firmly within the Late Prehistoric component. It is plausible that these represent repurposed points from an earlier time period. None of the projectile points retain sufficient morphology to make more detailed assumptions regarding affiliation with groups on the Plains (i.e., Avonlea) or farther west (i.e., Rosegate).

## RED AND YELLOW OCHRE

"Ochre" refers to a group of natural iron-based pigments that range from yellow to purple. All share iron oxide as a main ingredient (Thomas 1980:9). It is commonly found in a wide variety of bedrock and soils from various geologic ages (Erlandson et al. 1999). In the Rocky Mountains, ochre is often found as concretions or pockets in limestone and sandstone (Kornfeld et al. 2010:451). The Powars II red ochre quarry in the Hartville Uplift is the most notable source of this material (Stafford et al. 2003; Tankersley et al. 1995). Erlandson et al. (1999) demonstrated that unique trace chemicals in deposits across the western United States may be amenable to geochemical provenance studies, but this research has not been developed as of yet for widespread use.

Prehistoric ochre use extends back to the earliest known occupation of the region (Stafford et al. 2003; Tankersley et al. 1995). In addition to being used as pigments (e.g., Kornfeld et al. 2010:451–452), ochre may have been used medicinally as an astringent and antiseptic, an insect repellant, a hide tanning agent, and a preservative. Hill et al. (2011) suggest that the ~9,000 small nodules of red ochre recovered from the Paleoindian O.V. Clary site in western Nebraska were used in hearth-centered hide working and preservation activities. This interpretation is supported in part by the presence of multiple end scrapers (and other tools) with substantial amounts of red ochre embedded in their working edges. Regarding the large number of small ochre fragments at O.V. Clary, Hill et al. (2011) suggest that they may be the coarse fraction that resulted from pulverizing larger chunks of material. The use of red ochre in burial procedures is noted during the Middle Archaic (Millar 1981; Metcalf and Anderson 1981).

The Carter site assemblage includes 15 samples of ochre. Three are yellow and the remaining 12 are red. Several samples were recovered in situ that were soft and pulverized upon removal. Others retain sufficient structure for preservation. The largest intact piece is 19.0 mm in maximum length, and the smallest recovered sample is 3.1 mm. Given the ¼-inch screens that were used during excavation, undoubtedly several other fragments were lost during excavation. Munsell colors of the red ochre include 10R 3/6, 10R 5/8, 10R 4/8, 2.5YR 3/4, 2.5YR 4/8, 2.5YR 6/6, 2.5YR 4/6, 2.5YR 3/6, and 2.5YR 3/2. Yellow ochre Munsell colors are 10YR 7/8 and 10YR 6/8.

Ethnographic and archaeological accounts of ochre use in North America involve mostly red varieties. Examples of yellow ochre use are less common. Yellow ochre has been reported from village sites in Arizona, where they may have been related to ceramic manufacture (Harrill 1973; Sullivan 1988). Other evidence of yellow ochre use comes from south-central Oregon, where a piece of yellow ochre was included in a tool cache (Weide and Weide 1969, in Amick 2004). In Wyoming, one yellow ochre nodule was recovered from a Late Archaic component at 48CR2200 (Creasman 1983).

The ochre fragments excavated from the Carter site were consistently located within areas of dense cultural debris near hearth features (see Figures 6 and 7). Therefore, they appear to be associated with prehistoric use. Aside from being recovered in areas of dense artifacts near features, ochre use at the Carter site is ambiguous. A similar density of ochre artifacts is noted from data recovery at 48CR4681 (Reust et al. 1993:Figure 4.31). Francis and Sanders (1999) reported an Early to Middle Archaic cluster of red ochre fragments at the Trappers Point site (48SU1006) north of Pinedale. Reust et al. (1993:Figure 5.31) also note a ground ochre nodule at the Plant site, and as a cautionary note regarding potential cultural affiliations at 48SW7085, they note natural red and yellow ochreous sandstone clasts within alluvial stratigraphy (Reust et al. 1993:462).

## CERAMIC SHERD

Unlike the 1996 excavations that uncovered a large number of ceramic sherds, only one small ceramic sherd was excavated in 2012 (Figure 12). The 1996 sample was described as different from Intermountain Tradition or Crow pottery common in the area (Martin 2000). Provisionally termed Waltman Brown ware, that assemblage includes both fingernail impressed and plain treatments, brown fabric, and grit with micaceous paste. It was viewed as comparable to Uncompaghre Brown ware (Martin 2000).

Chomko (1992) and Middleton et al. (2007) summarize the chronology of ceramics in Wyoming as beginning around 1,800 years ago, when Plains Woodland pottery was introduced. Fremont and Upper Republican vessels appeared around 1,500 years ago and persisted until around 600 years ago. Black Buttes Gray (Fremont-like) is documented in southwest Wyoming between 1,300 and 650 years ago. Intermountain Tradition, Crow, and Boar's Tusk Gray pottery appeared around 750 to 650 years ago, and is followed Waltman Brown at this site (580 ± 60 B.P.) and then by Dismal River ceramics late in the sequence.

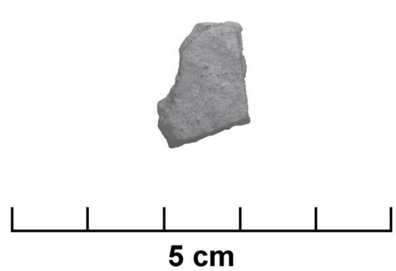


Figure 12: Ceramic sherd recovered from 2012 excavations.

The 2012 vessel sherd measures 14.6 by 11.2 by 5.1 mm. Vessel portion is unknown. It has a plain, slightly convex tan exterior surface that has been smoothed, giving the appearance of a thin slip, yet the temper remains exposed. The sherd fabric is very dark gray, with coarse rounded quartz sand tempered paste. The slightly concave interior surface has slight carbon residue or staining. Faint scraping is visible on the interior surface.

As this is the only sherd recovered in 2012, assigning this to a ceramic tradition cannot be confidently achieved. The M-Block contains two features dating to 900 to 700 B.P., which predates the 580 ± 60 B.P. occupation excavated in 1996. Chomko (1992) and Middleton et al. (2007) provide examples of Plains Woodland, Upper Republican, Fremont (Uinta Gray), Intermountain, and Black Buttes gray ceramics in Wyoming that date to the 900 to 700 B.P. time period, but this is on the early side of the Intermountain tradition. This period also pre-dates Crow pottery (Chomko 1992; Martin 2000). While the specific tradition remains unclear, the fabric of the 2012 sherd is inconsistent with Waltman Brown ware, in that it is very dark gray and lacks micaceous paste. In this way it is more similar to Black Buttes Gray, but again, affinity cannot be confidently understood with this single sherd.

## FAUNAL REMAINS

Analysis of faunal remains involved recording 33 attributes for each individual specimen or group of specimens (i.e., multiple items grouped from the same level or location). These 33 attributes include 13 curatorial and provenience descriptors; two taxonomic descriptors; nine anatomic, ontogenetic, and metric descriptors; eight taphonomic and human modification descriptors; and one comments field incorporating both field and laboratory observations.

Taxonomic identification of specimens is conducted using modern comparative skeletons and skeletal identification literature (Gilbert 1993; Gilbert et al. 1985; Hillson 1993; Olsen 1968, 1979). Size Class categories are assigned following Brain (1981) as adapted for North American fauna. It should be noted that some flexibility is allowed for certain species with regard to size class assignments to highlight noteworthy size differences between similar taxa. For instance, the weight of jackrabbits (*Lepus* sp.) might technically place them in the Size Class I category, yet they are coded as Size Class II to make a clear distinction between them and the smaller cottontails (*Sylvilagus* sp.). Assignment of taxonomically unidentifiable specimens to a given Size Class category is based on cortical thickness, internal and external structure, character of muscle attachments, foramina, and other markers, as well as circumference estimates (in the case of long bones). Anatomic and ontogenetic coding follows Todd (1987) and weathering stages were documented following Behrensmeyer (1978, as adapted by Todd 1987). Additional measurements are recorded as needed to aid in species and/or sex identification following standards established in Burnett et al. (2008), Hill (1996), Morlan (1991), and Speth (1983).

SWCA excavations at the Carter site recovered 1,800 faunal remains representing minimally 14 animals based solely on skeletal element frequencies. Eight different taxonomic categories are represented, including one mollusc, one avian, one cottontail, five small rodents, one jackrabbit, one canid, four pronghorn or pronghorn-sized artiodactyls, and one bison (Table 4). The pronghorn and bison are interpreted as animals harvested in small-scale, encounter hunting events in support of the residential camp. The bird, small rodents, and lagomorphs lack definitive evidence of human modification and it is unclear if they are part of the prehistoric subsistence record or naturally occurring background fauna. Data recovery excavations conducted in 1996 recovered 2,258 faunal remains reflecting a similar taxonomic roster including small mammals, one canid, two pronghorn, and one bison (Martin 1999a, 1999b, 2000). It should also be noted that three small, discrete concentrations of modern sheep bone were exposed during monitoring and reported on in 2013 (Burnett et al. 2013). The 2012 assemblage is described below as follows: recovery methods, attritional taphonomic agents, human modification, size class descriptions, spatial analysis, and summary.

## RECOVERY METHODS

Point provenience mapping accounted for 322 items (18 percent), 54 of which were mapped within Feature 6. Standard ¼-inch dry screening produced 806 items, (45 percent), ⅛-inch dry screening of feature fill recovered 131 items (7 percent), and flotation of select feature fill samples recovered 541

Table 4: Faunal Remains Summary from 2012 Excavations

| SIZE CLASS | TAXONOMIC CLASS | NOS | %NOS[A] | NISP | % NISP[A] | MNI |
|---|---|---|---|---|---|---|
| I | Gastropod | 2 | 0.2 | - | - | 1 |
| | Unspecified avian (grouse-size) | 1 | 0.1 | 1 | 0.5 | 1 |
| | Cottontail (*Sylvilagus* sp.) | 1 | 0.1 | 1 | 0.5 | 1 |
| | Small lagomorph or rodent, unspecified | 12 | 1.0 | 6 | 3.2 | (1) |
| | Small rodent, unspecified | 75 | 6.0 | 27 | 14.6 | 5 |
| | *Size Class I Totals:* | *91* | *7.2* | *35* | *18.9* | *8* |
| II | Jackrabbit (*Lepus* sp.) | 2 | 0.2 | 2 | 1.1 | 1 |
| | Large lagomorph or rodent, unspecified | 1 | 0.1 | 1 | 0.5 | (1) |
| | *Size Class II Totals:* | *3* | *0.2* | *3* | *1.6* | *1* |
| III | Canid | 1 | 0.1 | 1 | 0.5 | 1 |
| | Pronghorn | 49 | 3.9 | 49 | 26.5 | 3 |
| | Medium artiodactyl, unspecified | 249 | 19.8 | 61 | 33.0 | (2) |
| | *Size Class III Totals:* | *299* | *23.7* | *111* | *60.0* | *4* |
| IV | Bison | 2 | 0.2 | 2 | 1.1 | 1 |
| | Unspecified large artiodactyl | 110 | 8.7 | 34 | 18.4 | (1) |
| | *Size Class IV Totals:* | *112* | *8.9* | *36* | *19.5* | *1* |
| - | Unspecified | 754 | 59.9 | - | - | - |
| - | Heavy and light fraction | 541 | - | - | - | - |
| **Total:** | | **1,800** | **-** | **185** | - | **14** |

[a] percentages do not include heavy and light fraction items
MNI = minimum number of individuals
NISP = number of identified specimens where identified refers to skeletal element
NOS = number of specimens

items (30 percent). On average, there are 17 faunal specimens per square meter. However, this belies the higher density of bone around hearth features, especially Features 5 and 6. Methods of analysis for the flotation sample, described below, are different than the other items. Therefore, the numbers presented in the following discussion exclude the 5410item flotation sample unless otherwise noted.

## ATTRITIONAL TAPHONOMIC PROCESSES

Post-occupation taphonomic processes such as bone surface weathering, root etching, carnivore and rodent gnawing, and aeolian abrasion can sort faunal assemblages, remove or degrade certain items, and obliterate evidence of human modification. Beyond assessing these factors and their effect on the record of human involvement, these variables also provide information on both past and present ecological, environmental, and depositional influences. Weathering, root etching, carnivore and/or rodent modification, breakage and fragmentation, burning, and fluvial transport are discussed in turn below. Other taphonomic agents such as insect boring and aeolian abrasion, among others, were considered during analysis, but were not present.

*Weathering.* Overall, the Carter site faunal assemblage is in fairly good condition with regard to bone surface weathering. Weathering stages (after Behrensmeyer 1978 as adapted by Todd 1987) frequencies are as follows: Stage 1 (unweathered, dry) 3 percent (n = 39); Stage 2 (minor longitudinal cracking) 77 percent (n = 968); Stage 3 (minor exfoliation, more cracking) 20 percent (n = 251); and Stage 4 (moderate exfoliation/cracking and fibrous bone exposure) <1 percent (n = 1). Stages 4 and above generally represent the level at which the visibility of human modification is obliterated; weathering does not appear to affect the butchering record inherent in the assemblage. Of note is the friable nature of much of the assemblage, despite it having fairly well-preserved exterior surfaces. This condition is especially prevalent in the artiodactyl sample, specifically long bones, which show a propensity for separation of the cortical lamellar bone. One explanation for this pattern is that, given proximity to a spring-fed drainage, the site underwent intermittent, yet potentially significant periods of saturation from overbank flooding and/or rising of the ground water levels. This exposure to water would also introduce the activity of freezing while bone is saturated, submerged, or simply wet. Such influences from water have been shown to cause this type of damage to archaeological bone in both aerial and subaerial settings (Baxter 2004; Fisher 1995; Hedges and Millard 1995; Karr and Outram 2012; Karr 2014; Manifold 2012). Lastly, differential or flip-side weathering was not observed, nor was any significant difference in weathering stages noted as related to fragment relief height.

### ROOT ETCHING

Furrowing and grooving of bone surfaces by the acids excreted by living plant roots, decaying plant matter (Behrensmeyer 1978:154), or fungus (Grayson 1988:30; Morlan 1980:56–57) is present on only eight specimens (<1 percent). The degree of etching on these items was fairly minimal and expressed as shallow, dendritic channels on the cortical surfaces. It is not extensive enough to impede observation of butchering marks. All root-etched items are larger fragments of artiodactyl bone evenly split between pronghorn-sized and bison-sized remains and include five portions of long bone, an innominate fragment, and a rib fragment. The average length of these items is 60 mm, suggesting the possibility that these larger items created a microenvironment more susceptible to vegetation growth and associated root etching. This small sample was equally distributed between the H-Block and M-Block.

### CARNIVORE/RODENT MODIFICATION

Evidence of gnawing by carnivores is surprisingly low in the assemblage, with only one item showing modification. It is a 43-mm green broken large mammal long bone fragment that has minor striae and minor crenellation. It was recovered in the H-Block, 39 cm above Feature 6. The extreme rarity of carnivore-modified specimens suggests carnivores had little if any impact on skeletal element frequencies. That said, it is possible that carnivores removed select elements or portions of elements from the occupation locale. It is also possible some evidence of carnivore modification was lost because of the frequency of lamellar bone degeneration as described above, yet one would think that at least some evidence would remain. No specimens retained evidence of rodent gnawing.

**BREAKAGE AND FRAGMENTATION**

The assemblage is highly fragmented. Maximum lengths range from 3.3 to 149.0 mm, averaging 21.2 mm. Items measuring less than 2 mm, i.e., bone crumbs, were not included in this average. Only 49 items (4 percent) are unbroken. Thirty-five of these are small rodent bones, and the remaining 14 all are small elements from medium and large artiodactyls including pronghorn incisors, pronghorn and/or medium artiodactyl unfused epiphyses, a pronghorn astragalus, large artiodactyl sesamoids, and medium and large artiodactyl third phalanges. The remaining breakage types are distributed as follows: dry breakage, 72 percent (n = 910); green breakage, 16 percent (n = 202), indeterminate, 7 percent (n = 91), and transverse, <1 percent (n = 7). One of the green broken fragments also exhibits a transverse fracture. All transverse fractures co-occurred with thermal alteration.

The large amount of dry breakage correlates with the description of weathering presented above and, with the exceptions noted above, occurs across body size classes, taxonomic classes, skeletal elements, and specimen size, with no one category more susceptible to this type of breakage than another. As described, it seems likely that chemical leaching from intermittent saturation, coupled with possible intermittent surface exposure made the faunal remains extremely friable, despite the overall good condition of the bone surfaces.

Green, helical breaks are indicative of items broken while still fresh, and while green breaks can originate from several causes, the green broken specimens in this sample are interpreted as resulting from butchering. The low incidence of carnivore modification supports this interpretation. Of the 202 green broken specimens in the assemblage, 81 percent (n = 163) are medium or large artiodactyl remains, and the remainder are unspecified fragments. Of the 163 medium or large artiodactyl green broken specimens, 88 percent (n = 144) are long bone fragments, and the remainder are rib fragments, innominate fragments, and phalanx fragments. These items are discussed in more detail below. The highest density of green broken elements occurred around Feature 6 in the H-Block, with less, yet still notable amounts around Features 4 and 5 in the M-Block.

Indeterminate breakage represents specimens that were difficult to visually sort between dry and green, although the former is most likely. Break edges were not smooth and helical-shaped, as is diagnostic for green breaks, yet they lacked the jagged stepped or "sawtoothed" edges typical of dry breaks. The indeterminate category likely reflects in situ separation of bone along existing fractures related to the normal process of weathering. Indeterminate breakages occur across body size classes, taxonomic classes, skeletal elements, and specimen size, and there is no distinct spatial patterning to these items.

Transverse breaks are generally associated with dry snap breaks or heating (Thurman and Willmore 1981). The small sample of eight transversely broken items in the assemblage all co-occur with exposure to heat as four are burned and four are calcined. Four are long bone fragments, and the remainder is unspecified pieces.

**BURNING**

Although evidence of burning on faunal remains does not unquestionably reflect human behavior (Lyman 1994:384), spatial association between the burned sample and thermal features strongly suggests direct anthropogenic involvement. The low number of crazed and/or pot-lidded lithic artifacts further supports this notion and suggests that natural fires did not influenced the site materials. That said, the sample of items exposed to heat is low at only 11 percent (n = 133). Of this sample, 35 percent (n = 47) are carbonized (blackened/charred), and the remaining 65 percent (n = 86) are calcined (burned/heated to the point of mineral recrystallization). Medium artiodactyl long bones account for 11 percent (n = 15) of the heat-altered sample, while the remaining 89 percent (n = 118) are unspecified fragments.

David (1990), in a controlled bone burning experiment, exposed bone to three types of fire: a brush fire, a cooking hearth with active flames for 25 minutes, and a cooking hearth with active flames for 65 minutes followed by 5 hours of exposure to smoldering coals. Fragments were 98 percent burned from the brush fire with no calcined specimens. The cooking hearth with active flames burned 76 percent and calcined the remaining 24 percent. And the long-duration fire/coals event calcined 95 percent of fragments. David's (1990) research suggests that high percentages of calcined bone, specifically greater than 90 percent, are primarily the result of food waste disposal. In this context, the Carter site carbonized and calcined sample appears to reflect items that experienced only short duration exposure to fire or heat. As noted, the highest density of bone came within and around thermal features, yet most show no evidence of exposure to heat or fire, thus significant camp cleanup within hearths seems unlikely (Black and Thoms 2014:209–210).

The flotation sample from hearth fill shows a slightly higher percentage of heat alteration with nearly half (47 percent, n = 253) of the 541 fragments burned or calcined. The number of calcined is just slightly more represented. Inclusion of the flotation sample brings the frequency of burning for the entire assemblage up to 21 percent (n = 386 of 1,800).

## FLUVIAL TRANSPORT

Given that the site is situated on the banks of Keg Spring Draw, one of the more significant spring-fed drainages in the vicinity, consideration was given to the potential for fluvial energy having moved and/or removed faunal remains before recovery (Voorhies 1969). In short, no patterning in long-axis orientation was noted, no patterning in fragment inclinations was noted, no clusters of bones (such as might be caused by large elements catching smaller elements) were observed, nor is there clear evidence of density mediated attrition which would suggest certain elements were washed from the site before burial or during fluvial depositional events. While it is assumed that occasional over-bank flooding likely occurred, no evidence was recorded during excavation nor observed during analysis that would suggest the remains were subjected to high-energy flow.

## SUMMARY OF ATTRITIONAL TAPHONOMIC AGENTS

The attritional taphonomic agents of weathering, root etching, carnivore/rodent gnawing, breakage and fragmentation, burning, and fluvial transport appear to have had limited biasing influences on the faunal assemblage. A few questions do remain. Although bone surfaces generally appear to be in good condition, they are brittle and friable. The degree to which certain elements were degraded before recovery is unknown. Also, while observable presence of carnivore modification is limited, it is still possible carnivores removed certain elements before site burial. Otherwise, the remaining taphonomic agents do not appear to have greatly distorted the record of human subsistence as interpreted through the faunal remains.

## HUMAN MODIFICATION

Direct evidence of human butchering patterns in the form of cut marks and impact marks, cones, and impact flakes is surprisingly low. Only one item, a bison rib blade fragment, exhibits cut marks. Robust, deep "sawing" cuts occur on both medial and lateral surfaces oriented perpendicular to the blade long-axis. After scoring, the distal portion of the rib was then snapped off (Figure 13). It was recovered from the group of six units near the center of the 2012 excavation area. A second item, recovered in the H-Block adjacent to Feature 6, is a medium artiodactyl long bone flake with possible cut marks. This item is green broken, has an impact cone, and the possible cut marks are extremely faint, parallel striae. It is difficult to confidently assert these are unquestionably cut marks, as cortical exfoliation partially extends through the striae.

Although green breakage only accounts for 16

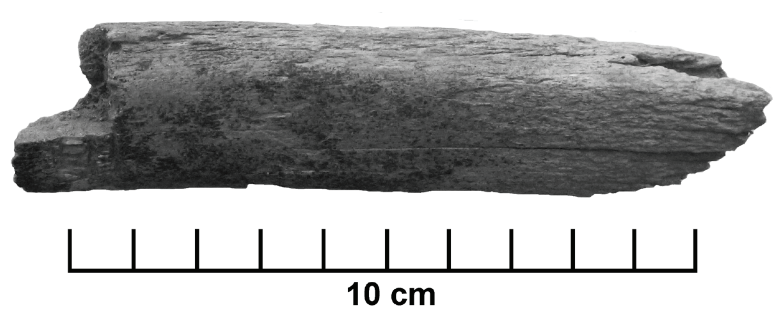


Figure 13: Cut and snapped bison rib blade fragment (lateral view top, medial view bottom).

percent of the items, the lack of evidence of artiodactyl long bone butchery is somewhat surprising. Only two items, both medium artiodactyl green broken long bone flakes, retain evidence of impact cones. One of these is the item with possible cut marks described above. Both were recovered in the H-Block adjacent to Feature 6.

Also expected to reflect long bone reduction in concert with green breakage were the presence of bone impact flakes. However, while more were present than cut marked or impacted specimens, the overall number of bone impact flakes is still lower than expected (n = 25). One is a large artiodactyl long bone flake, and the remaining items are all medium artiodactyl long bone flakes. Two of the medium artiodactyl sample were identified as pronghorn and include a humerus mid-shaft fragment and a radius distal shaft fragment. These bone impact flakes range in size from 9.5 to 61.8 mm with an average size of 35.2 mm. Twenty of the bone impact flakes came from within or adjacent to Feature 6. Interestingly, none were recovered around Features 4 or 5.

As described above, of the 202 specimens that were green broken, 81 percent (n = 163) are medium or large artiodactyl remains, and the remainder are unspecified fragments. Of the 163 medium or large artiodactyl green broken specimens, 88 percent (n = 144) are long bone fragments; the remainder are rib fragments, innominate fragments, and phalanx fragments. The highest density of green broken elements occurred around the Feature 6 area in the H-Block, with less, yet still notable amounts in the Feature 4 and Feature 5 areas in the M-Block. Despite the low numbers of cut marked or impacted bone fragments, and the fairly low number of bone impact flakes, this frequency of green broken long bones provides the best evidence of butchering practices at the site and supports the assumption that marrow extraction was a targeted undertaking. Of interest to this discussion is the presence of two medium artiodactyl phalanges that were green broken. Phalanges are elements of low return rates and are considered "stop elements," elements where effort at nutrient extraction outweighs the gain (Burger et al. 2005:1150). The presence of butchered and/or reduced low utility elements may indicate a population that was experiencing nutritional stress. Alternatively, it could also simply be a reflection of snacking behavior.

## TAXONOMIC INVENTORY

As noted, faunal remains recovered during the 2012 excavations represent eightdifferent taxonomic categories, including mollusc, avian, cottontail, small rodents, jackrabbit, pronghorn, canid, and bison (Table 4).

### SIZE CLASS I

**Gastropod.** Two gastropod shell fragments were recovered, both from the H-Block. They are fragments of the body whorl and both are missing the apertures. The fragments measure 4.2 and 6.5 mm, and they were not identifiable to the species level.

**Avian.** One fragment of unspecified avian was recovered from the H-Block. It is a grouse-sized ilium fragment measuring 64.9 mm. It is weathering stage 1, indeterminately broken, and unburned. Based on its vertical location, it is unlikely to reflect a subsistence item, although artiodactyl remains were present in the same level.

**Cottontail.** One item was identified as either desert or mountain cottontail. It is a left scapula glenoid and blade fragment measuring 20.4 mm. It is weathering stage 2, dry broken, and unburned. It shows no clear signs of human modification, although small mammal consumption does not always leave such evidence.

**Unspecified Small Lagomorph or Rodent.** Twelve remains are assigned to the unspecified small lagomorph or rodent category. These items lack distinct markers or characteristics to allow speciation, yet are clearly within the size range of cottontails, ground squirrels, and gophers. Most of these specimens are cranial fragments, with others including both axial and appendicular fragments. All but two of these were recovered in H-Block at various levels. In general, they are minimally weathered, show some dry breakage, and lack the cortical exfoliation common to other specimens in the assemblage described above.

**Unspecified Small Rodent.** As noted (Table 4), five small rodents were recovered. These represent mice- or vole-sized remains. These individuals were identified as complete or mostly complete animals during excavation and therefore interpreted as burrow deaths. Because of this, they did not undergo full analysis. The completeness of these skeletons removes any doubt these are naturally occurring intrusive background fauna unrelated to prehistoric subsistence behavior.

## SIZE CLASS II

***Jackrabbit.*** Two jackrabbit items, both femur fragments, were recovered from the 2012 excavations. One is an unsided femur condyle fragment from the H-Block, one level above Feature 6. The other is a left femur distal epiphysis fragment from the M-Block. Both measure less than 18 mm and are weathering stage 2. One is dry broken, while the other is indeterminately fractured, and neither are heat altered.

***Unspecified Large Lagomorph or Rodent.*** A third item in the Size Class II inventory is a proximal left calcaneus fragment. It was recovered from the H-Block, measures 20.7 mm, is weathering stage 2, is dry broken, and unburned. It could not be identified to the species level.

As with Size Class I items, none of the Size Class II elements retain definitive evidence of butchery or human consumption. The dearth of jackrabbit elements is notable, given that Lubinski (2003) demonstrates that rabbit bone dominates identified fauna at more sites in the Wyoming Basin than any other taxon, regardless of unquestionable use as a food source.

## SIZE CLASS III

**Canid.** A robust, mostly complete left canid mandible was recovered in the H-Block about four m east of and just slightly above Feature 6 (Figure 14). It is weathering stage 2, has a vertical dry break through the dentary ramus, and is unburned. Wear on the teeth indicates the animal was fully mature, although no further precise age estimate was obtained during analysis. It was compared to wolf and large domestic dogs available in the literature, which led to interpretive ambiguity as to the species of this individual. Dr. Danny Walker, who is an expert in wolf, dog, and wolf-dog hybrid identification (Walker 2000; Walker and Frison 1982) confirmed this specimen is indeed a domestic canid based on the distance (crowding) between the carnivore and the premolar (personal communication to John Kennedy, 2014).

**Pronghorn and Unspecified Medium Artiodactyl.** As shown (Table 4), 298 items are coded as pronghorn or pronghorn-sized. Forty-nine (16 percent) of the elements are identified specifically as pronghorn. The remainder lacked identifying characters to confidently assign species. While there is a chance some of the unspecified medium artiodactyls may be deer, given the context of their discovery and consistent patterns of weathering and breakage, these are assumed to also be pronghorn. Whether pronghorn or deer, these Size Class III elements are interpreted as individuals killed during encounter hunting and transported to the camp site. A brief summary of the identified pronghorn remains is provided, but for the reasons described, the Size Class III artiodactyls are treated here as one analytic unit.

Identified pronghorn remains include fragments of two cranial elements, 11 isolated mandibular teeth, six mandibles, four humerii, seven radius-ulnae, six metacarpals, one acetabulum and pubis, two tibiae, one lateral malleolus, one astragalus, three metatarsals, one metapodial, two first phalanges, one second phalanx, and one third phalanx. All but one metatarsal and the second phalanx were excavated from the H-Block, within or adjacent to Feature 6. The two outliers were excavated from the M-Block, near Feature 5. Three groups of conjoined pronghorn elements were identified during excavation: a distal tibia, lateral malleolus, and astragalus in Feature 6; a radius distal diaphysis, distal epiphysis, and ulna shaft adjacent to Feature 6; and two unfused metapodial condyles, also within Feature 6. Of the 23 long bones identified as pronghorn, 65 percent (n = 15) are green broken, 22 percent (n = 5) are indeterminately fractured, one is dry broken, and two are unbroken, unfused epiphyses. Two of the bone impact flakes are identified as pronghorn. Based solely on skeletal element frequency, the minimum number of pronghorn is two (Table 5). Five elements meet this criteria: mandibles, radius-ulnae, metacarpals, os coxae, and tibiae.

Comparison of different fusion rates indicates a third individual is present as there are two radius-ulnae with clear fusion of the two elements and one radius distal diaphysis and unfused epiphysis. Additionally, a probable fetal or neonatal long bone fragment is in the assemblage. Following the assumption this is likely a pronghorn, this item represents a fourth individual. Lastly, a conjecture regarding

Figure 14: Canid mandible and first molar.

space, time, and minimum number of pronghorns may indicate another individual. All elements used to tabulate the minimum number of individuals were recovered in the H-Block in or around Feature 6. Two pronghorn elements are present in the M-Block near Feature 5. Following the assumption that the occupations may have been separated in time, this would indicate the remains are not associated with those in the H-Block and could possibly represent a fifth individual.

The 249 unspecified Size Class III artiodactyl items include fragmentary remains of crania, mandibles, scapulae, humerii, radii, tibiae, metatarsals, metapodials, unspecified long bones, phalanges, ribs, lumbar vertebrae, os coxae, a sesamoid, and unspecified flat bones. By far the most voluminous items are unspecified long bones, which account for almost half (49 percent) of the category. A high percentage (72 percent) are green broken. As mentioned, it is highly likely these items are from pronghorn, yet even if there are deer in the mix, they appear to have been handled similarly with regard to transport, preparation, and consumption. Following this assumption, it is informative to look at the Size Class III artiodactyls as a single analytic unit.

Table 5 summarizes all Size Class III artiodactyl remains and provides precise detail on elements and portions identified, as well as tabulations of minimum number of individuals (after White 1953), minimum number of elements, minimum animal units, and standardized minimum animal units (Binford 1984). These data are graphically represented (Figure 15).

Long bones (excluding unfused epiphyses and condyles) comprise over half of the medium artiodactyl sample (54 percent, n = 162). Of these, 74 percent (n = 120) are green broken, while the remainder or dry or indeterminately broken, with a small number (n = 5) that are transversely broken as related to heat alteration. Twenty percent (n = 24) of this sample are impact flakes. Despite that 55 were within Feature 6, only 12 percent (n = 14) are heat altered. Sizes of the long bone sample range from 9.1 to 115.2 mm, with an average size of 44.6 mm. The 117 green broken long bone flakes in the sample range from 16.5 to 93.2 mm, with an average size of 45.5 mm. Finally, impact flakes range between 9.5 and 61.8 mm, with an average of 34.1 mm. As will be discussed, these size ranges are informative with regard to interpretations of subsistence behavior.

Looking at element frequencies (Figure 15), the first trait that is apparent is that limbs are highly represented, while axial elements are not, with the exception of cranial and os coxae fragments. If complete animals were introduced to the site, it would seem that at least some vertebrae and more ribs would be represented. As described above, this lack of axial elements cannot be explained by taphonomic processes. Instead, this likely reflects the selective transport of anatomic units from the

Table 5: Size Class III Medium Artiodactyl Remains Summary

| ELEMENT AXIAL | NISP | NISP% | LEFT | RIGHT | UNSIDED/ | MNI | MNE | MAU | %MAU |
|---|---|---|---|---|---|---|---|---|---|
| Cranium | 10 | 3 | 5 | - | 5 | 1 | 1 | 1.0 | 50 |
| Mandible | 12 | 4 | 1 | 3 | 4 | 2 | 2 | 1.0 | 50 |
| Incisors | 7 | 2 | 4 | 3 | - | 1 | 7 | 0.9 | 45 |
| Mandibular molars | 4 | 1 | 2 | 1 | 1 | 1 | 3 | 0.25 | 13 |
| Enamel fragment | 40 | 13 | - | - | - | - | - | - | - |
| Lumbar | 6 | 2 | 2 | 1 | 2 | 1 | 2 | 0.4 | 20 |
| Rib | 28 | 9 | 5 | 5 | 18 | 1 | 7 | 0.04 | 2 |
| Scapula | 2 | 1 | - | 1 | 1 | 1 | 1 | 0.5 | 25 |
| Humerus (proximal) | 1 | 0 | 1 | - | - | 1 | 1 | 0.5 | 25 |
| Humerus (shaft) | 5 | 2 | 2 | 2 | 1 | 1 | 2 | 0.5 | 25 |
| Humerus (distal) | 1 | 0 | 1 | - | - | 1 | 1 | 0.5 | 25 |
| Radius-Ulna (proximal) | 1 | 0 | 1 | - | - | 1 | 1 | 0.5 | 25 |
| Radius (shaft) | 2 | 1 | - | - | 2 | 1 | 1 | 0.5 | 25 |
| Ulna (shaft) | 1 | 0 | - | 1 | - | 1 | 1 | 0.5 | 25 |
| Radius-Ulna (distal) | 4 | 1 | 2 | 2 | - | 2 | 4 | 2.0 | 100 |
| Metacarpal (proximal) | 3 | 1 | 2 | 1 | - | 2 | 3 | 1.5 | 75 |
| Metacarpal (distal) | 3 | 1 | 1 | 2 | - | 2 | 3 | 1.5 | 75 |
| Os coxa | 4 | 1 | - | 2 | 2 | 2 | 2 | 1.0 | 50 |
| Femur (shaft) | 1 | 0 | - | 1 | - | 1 | 1 | 0.5 | 25 |
| Tibia (proximal) | 1 | 0 | 1 | - | - | 1 | 1 | 0.5 | 25 |
| Tibia (shaft) | 9 | 3 | 2 | 4 | 3 | 2 | 3 | 1.5 | 75 |
| Lateral malleolus | 1 | 0 | 1 | - | - | 1 | 1 | 0.5 | 25 |
| Astragalus | 1 | 0 | 1 | - | - | 1 | 1 | 0.5 | 25 |
| Metatarsal (proximal) | 1 | 0 | 1 | - | - | 1 | 1 | 0.5 | 25 |
| Metatarsal (shaft) | 1 | 0 | - | - | 1 | 1 | 1 | 0.5 | 25 |
| Metatarsal (distal) | 2 | 1 | 1 | 1 | - | 1 | 2 | 1.0 | 50 |
| 1st phalanx | 4 | 1 | - | - | 4 | 1 | 3 | 0.4 | 20 |
| 2nd phalanx | 4 | 1 | - | - | 4 | 1 | 3 | 0.4 | 20 |
| 3rd phalanx | 1 | 0 | - | - | 1 | 1 | 1 | 0.1 | 5 |
| Proximal sesamoid | 1 | 0 | - | - | 1 | 1 | 1 | 0.1 | 5 |
| Flat bone fragment | 4 | 1 | - | - | - | - | - | - | - |
| Long bone fragment | 123 | 41 | - | - | - | - | - | - | - |
| Metapodial (shaft) | 3 | 1 | - | - | 3 | 1 | 1 | 0.25 | 13 |
| Metapodial (distal) | 7 | 2 | 1 | 2 | 4 | 1 | 5 | 1.25 | 63 |

%MAU = percent minimum animal units
MAU = minimum animal units
MNE = minimum number of elements
MNI = minimum number of individuals
NISP = number of identified specimens

kill location to the camp. Ethnographic examples of reindeer butchering demonstrate the rapidity and ease with which an animal can be partially reduced to facilitate transport in a manner that may leave little evidence of butchering marks (Domínguez-Solera 2012). Also apparent is the complete absence of proximal femora, distal femora, and distal tibiae, despite all other limb portions being fairly well represented, with the exception of metacarpal shafts. Distal radius-ulnae, proximal metacarpals, distal metacarpals, and tibiae shafts are the most highly represented elements, all exhibiting a high incidence of green breakage. Select examples of these, along with distal humerii, are shown in Figure 16.

The pronghorn mandible sample includes four dentary rami and four isolated molars. Although coded at weathering stages 2 and 3, the condition of the molars within the dentary rami was extremely cracked and crumbled. Three of the four were mapped within Feature 6, and it is assumed that heat alteration increased their fracture rate. As a result, no age estimations or seasonality were available directly from mandible data. However, a single, isolated third molar (M3) offers some suggestion of seasonality. It shows no wear on the occlusal surface, thus was unerupted, yet appears to be mostly, if not fully formed. Following Lubinski (2001) this would suggest this juvenile animal was around one

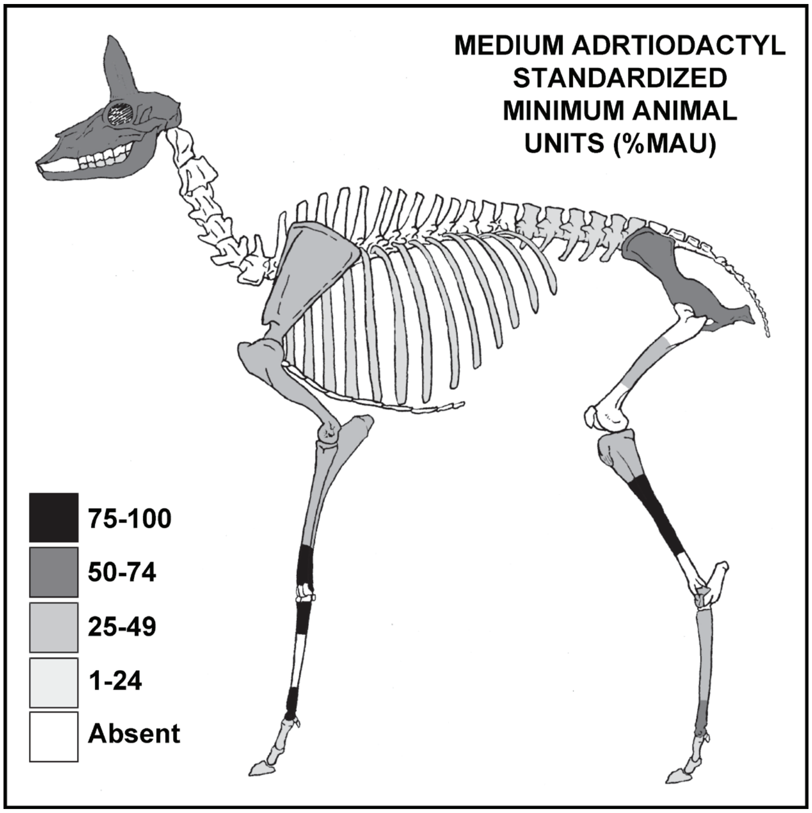


Figure 15: Medium artiodactyl standardized minimum animal units (%MAU).

year old. Based on a June 1 birthing pulse, which is a reliable average date for modern pronghorn, this would suggest this animal died in the spring to late spring. This is commensurate with the presence of a fetal or neonatal Size Class III long bone fragment, which also supports a spring seasonality.

## SIZE CLASS IV

**Bison and Unspecified Large Artiodactyl.** Four elements are identifiable as bison. One is a cranial flake of a left humerus measuring 84.5 mm. The flake is green broken and unburned, with stage 2 weathering. The second is a complete left proximal tibia (Figure 17). The fusion line between the diaphysis and the epiphysis is still visible and it measures 135.8 mm in maximum length. It is unburned and exhibits both green and dry breaks, with stage 3 weathering. The third is a left distal metatarsal measuring 135.2 mm in length. This element also lacks heat alteration, it is green broken, and has stage 2 weathering. The fourth is the aforementioned rib with cut marks (see Figure 13). It is a right rib blade fragment measuring 108.7 mm. The rib is green broken, with stage 3 weathering. It has no root etching and it not heat altered. The humerus shaft fragment, the tibia, and the cut rib were located in the M-Block around Features 4 and 5, while the metatarsal was in the H-Block near, but slightly higher than Feature 6.

Both the tibia and the metatarsal were compared metrically to a sample of bison from a Late Prehistoric kill (Speth 1983) to confirm species identification, as well as to attempt sex identification. Both are confirmed to be from bison cows. The tibia was compared to a sample of 27 bison tibiae (9 cows, 18 bulls) and falls solidly within the cluster of large cows (Figure 18). The bison metatarsal (Figure 19) is fairly diminutive and initially thought to possibly be elk. It was compared to 20 bison metatarsals (9 cows, 11 bulls) and falls among small bison cows (Figure 20). For these two items to compare so differently suggests that two bison cows are represented. This idea is also supported by their association with different features.

One other diminutive large artiodactyl element, a lateral malleolus, is also potentially elk-sized. Neither comparative specimens nor published metric data were available during analysis, thus the item

Figure 16: Select green broken pronghorn forelimb elements (top row – humerii; second row – radius-ulnae; bottom rows – metacarpals).

Figure 17: Bison proximal tibia.

remains in the general large artiodactyl category. While there is a possibility elk remains are in the sample, none could be confirmed and, as with the medium artiodactyls, the large artiodactyl sample is treated as a single analytical unit.

The large artiodactyl sample appears slightly more weathered than the medium artiodactyls. Removing the large number of tooth enamel fragments, which weather far slower and skew the sample, almost equal numbers of weathering stages 2 and 3 are present (n = 36 and 30, respectively). This could be a reflection of the difference in relief height between the smaller and larger animals. Root etching is present on three items. These include a humerus fragment, an unspecified long bone fragment, and a rib fragment. These items are fairly large, ranging from 57 to 85 mm, and occur in both blocks. Thirty items are green broken, 28 of which are long bones and two are ribs. One of the long bone fragments is a 43-mm impact flake. As noted, the rib is the only item in the entire assemblage with definitive cut marks. No large artiodactyl items were heat altered.

Table 6 summarizes all Size Class IV remains, which are graphically represented (Figure 21). The 68 axial elements are predominantly tooth enamel fragments (n = 46). The other axial items certainly do not reflect a robust sample, but do indicate the presence of ribs, a thoracic vertebra, and unspecified vertebrae. The 39 appendicular elements pose an interesting, if not unexpected pattern. The portions of long bones present are high yield locations for both marrow and oleic acid (Morin 2007) and are typically underrepresented at sites where marrow extraction was a subsistence focus. Granted, the numbers of humerii and tibiae are low overall, but one would expect more of the lower utility value elements. In addition, these portions tend to have higher density values. Despite this unexpected pattern, it is evident that marrow was extracted from the one or two bison as green breaks occur on all identifiable long bones including proximal humerii, a proximal metacarpal, and a distal metatarsal.

## UNSPECIFIED

Sixty percent of the items in the assemblage could not be assigned to a Size Class (n = 754, ex-

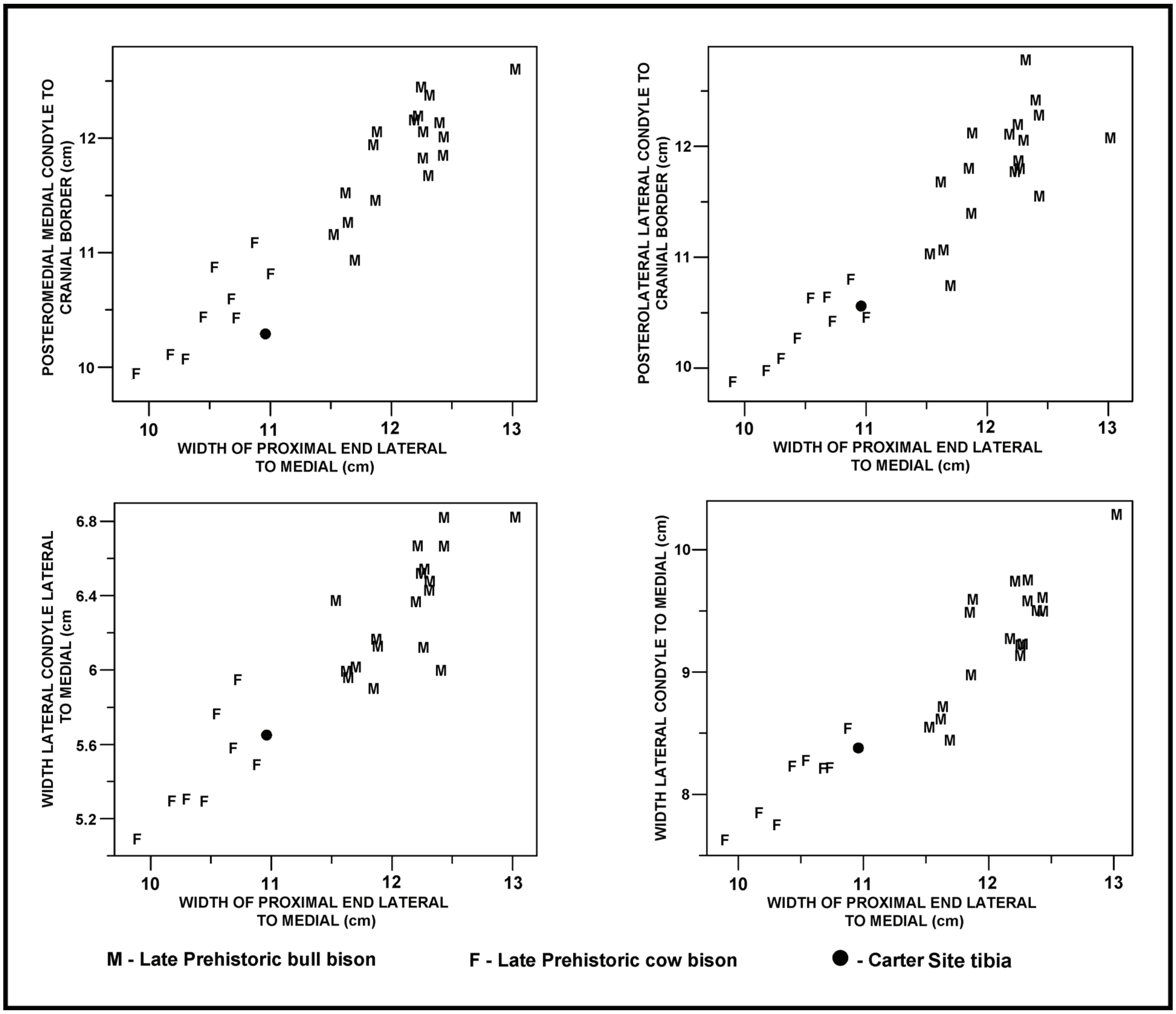


Figure 18: Bison tibia plotted against Late Prehistoric sample (Speth 1983).

Figure 19: Bison left metatarsal.

cluding the flotation sample). The items could not be confidently assigned to either a taxonomic category or to skeletal element. These pieces range from 6.3 to 58.2 mm, with an average size of 19.6 mm. This sample is represented by highly fragmented items that are predominately minimally weathered (Stage 2, 80 percent, n = 603), dry broken (70 percent, n = 527), and unburned (94 percent, n = 709). None exhibit carnivore modification, root etching, or evidence of butchering. In an effort to address the possibility for bone grease rendering, which would have resulted in long bone ends being extensively reduced, these unspecified fragments were closely inspected to identify key bone end morphologies such as articular surfaces, cancellous bone, compact pores, etc. This analysis did not identify small ungulate long bone ends among the unspecified sample, and it appears these items are the result of weather-

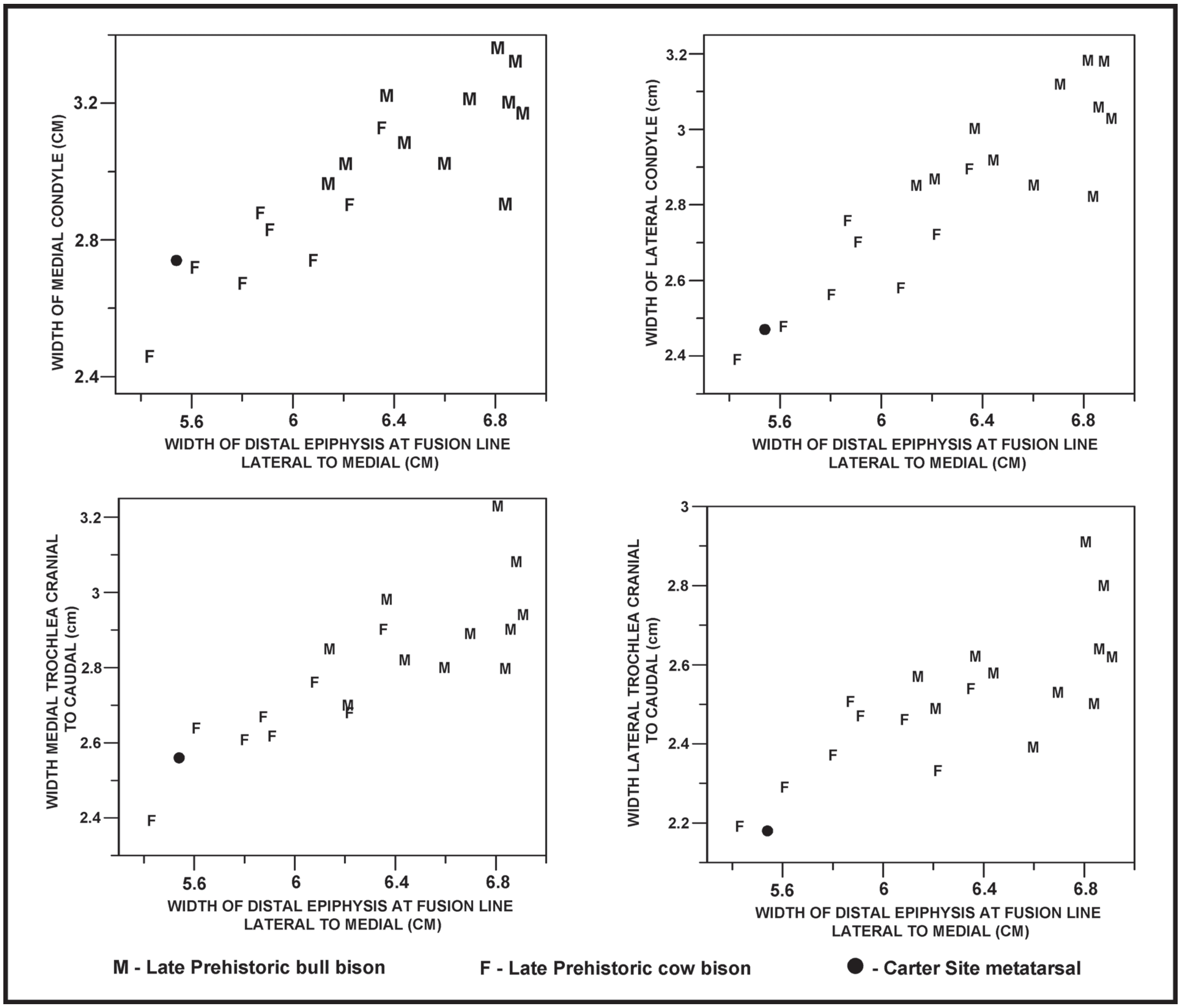


Figure 20: Bison metatarsal plotted against Late Prehistoric sample (Speth 1983).

ing rather than intensive, deliberate reduction.

## SPATIAL ANALYSIS

**Horizontal Distribution.** Not surprisingly, as was mentioned throughout the faunal description, bone occurred in proximity to features (Figures 22–27). Preparation, cooking, and consumption of pronghorn and bison was clearly a hearth-centered activity at the Carter site. Activity around the large roasting feature (Feature 6) in the H-Block produced the most stone and bone across the site. Table 7 summarizes the recovery of bone by location and demonstrates the abundance of subsistence remains in H-Block, which contained more Size Class II, Size Class III, unspecified, and flotation bone. Numbers are slightly adjusted between the three blocks when excluding the flotation sample: H-Block, 55 percent (n = 696); M-Block, 34 percent (n = 423); and non-block, 11 percent (n = 140). Of all medium artiodactyl remains, 66 percent (n = 197) are from the 12 units closest to Feature 6, and 72 percent (n = 214) are from the H-Block (Figures 23 and 26). The M-Block also demonstrates pronghorn-related subsistence activity around Features 4 and 5 (Figure 26), but not to the extent as in the Feature 6 vicinity.

The Size Class IV remains exhibit some interesting and different patterns (Figures 24 and 27; Table 7). Bison-sized remains are fairly evenly represented in both blocks, but of note is that 11 percent of large artiodactyl specimens were excavated from only six units situated between the main blocks. The pattern was not apparent during excavation, but in hindsight, it is quite likely there was either a processing area between the two blocks or perhaps another hearth

Table 6: Size Class IV Large Artiodactyl Remains Summary

| ELEMENT | NISP | NISP% | LEFT | RIGHT | UNSIDED/ AXIAL | MNE | MNI | MAU | %MAU |
|---|---|---|---|---|---|---|---|---|---|
| Enamel fragment | 46 | 41 | - | - | - | - | - | - | - |
| Thoracic | 1 | 1 | - | - | 1 | 1 | 1 | 0.07 | 14 |
| Vertebral fragment | 2 | 2 | - | - | - | - | - | - | - |
| Rib | 19 | 17 | - | 1 | 18 | 4 | 1 | 0.01 | 2 |
| Humerus (proximal) | 1 | 1 | 1 | - | - | 1 | 1 | 0.5 | 100 |
| Humerus (shaft) | 2 | 2 | 2 | - | - | 1 | 1 | 0.5 | 100 |
| Ulnar carpal | 1 | 1 | 1 | - | - | 1 | 1 | 0.5 | 100 |
| Metacarpal (proximal) | 1 | 1 | 1 | - | - | 1 | 1 | 0.5 | 100 |
| Tibia (proximal) | 1 | 1 | 1 | - | - | 1 | 1 | 0.5 | 100 |
| Tibia (shaft) | 1 | 1 | - | - | 1 | 1 | 1 | 0.5 | 100 |
| Lateral malleolus | 1 | 1 | 1 | - | - | 1 | 1 | 0.5 | 100 |
| Metatarsal (distal) | 1 | 1 | 1 | - | - | 1 | 1 | 0.5 | 100 |
| 3rd phalanx | 2 | 2 | - | - | 2 | 2 | 1 | 0.25 | 50 |
| Proximal sesamoid | 1 | 1 | - | - | 1 | 1 | 1 | 0.25 | 50 |
| Distal sesamoid | 1 | 1 | - | - | 1 | 1 | 1 | 0.25 | 50 |
| Long bone fragment | 30 | 27 | - | - | - | - | - | - | - |
| Metapodial (distal) | 1 | 1 | - | - | 1 | 1 | 1 | 0.25 | 50 |

%MAU = percent minimum animal units
MAU = minimal animal units
MNE = minimum number of elements
MNI = minimum number of individuals
NISP = number of identified specimens

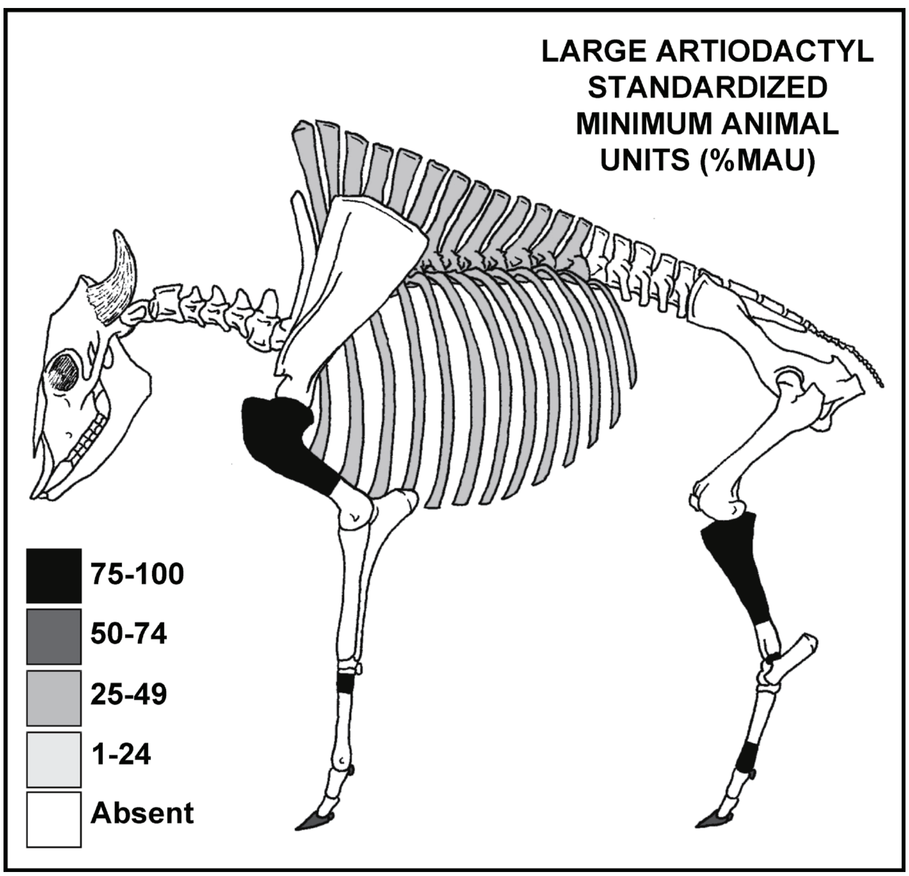


Figure 21: Large artiodactyl standardized minimum animal units (%MAU).

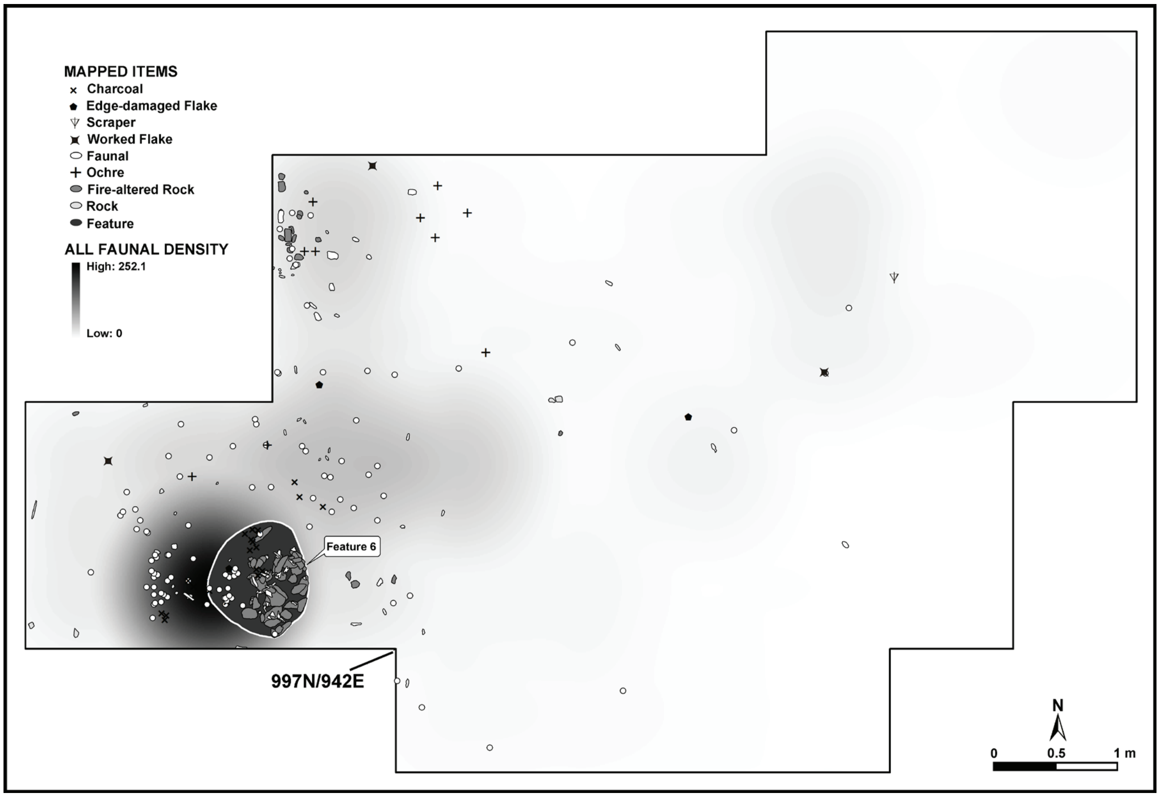


Figure 22: H-Block all faunal density.

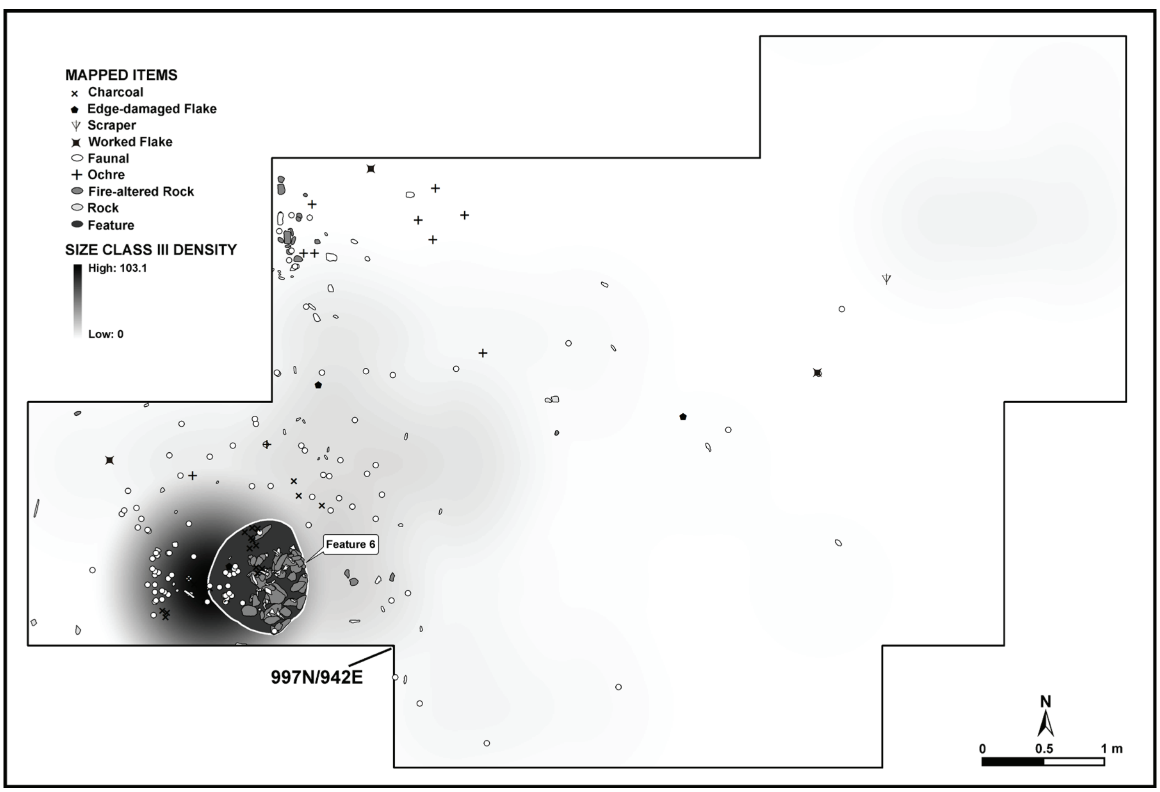


Figure 23: H-Block Size Class III faunal density.

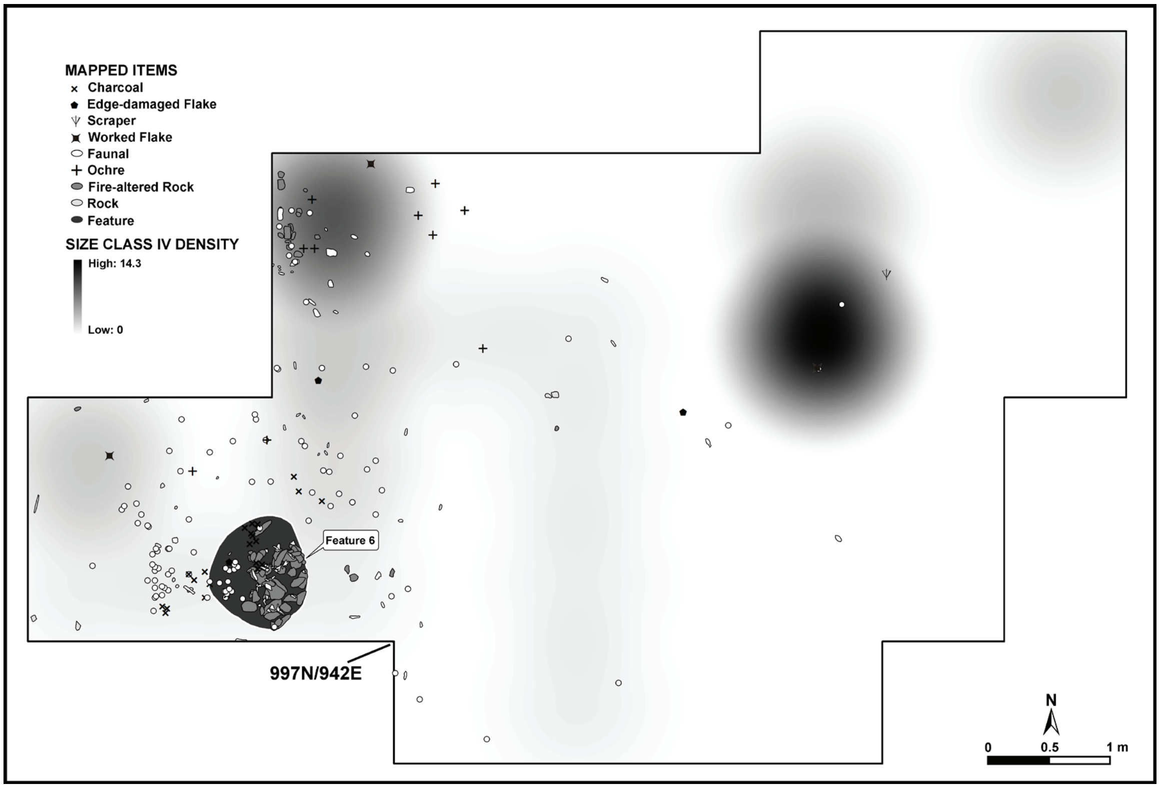


Figure 24: H-Block Size Class IV faunal density.

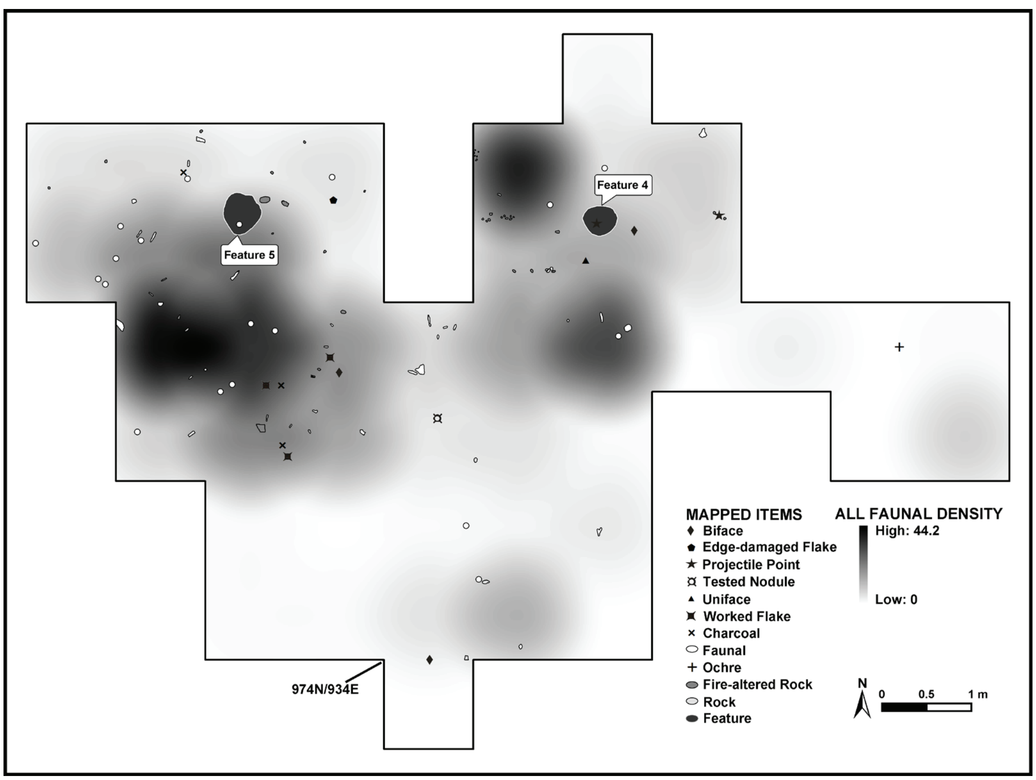


Figure 25: M-Block all faunal density.

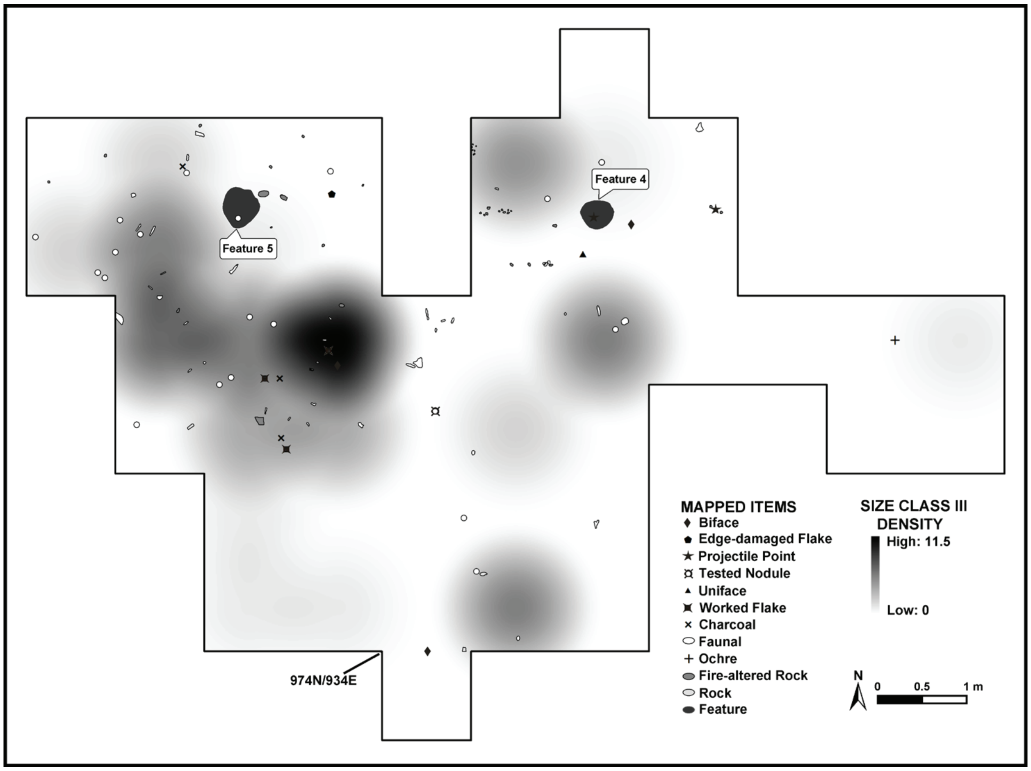


Figure 26: M-Block Size Class III faunal density.

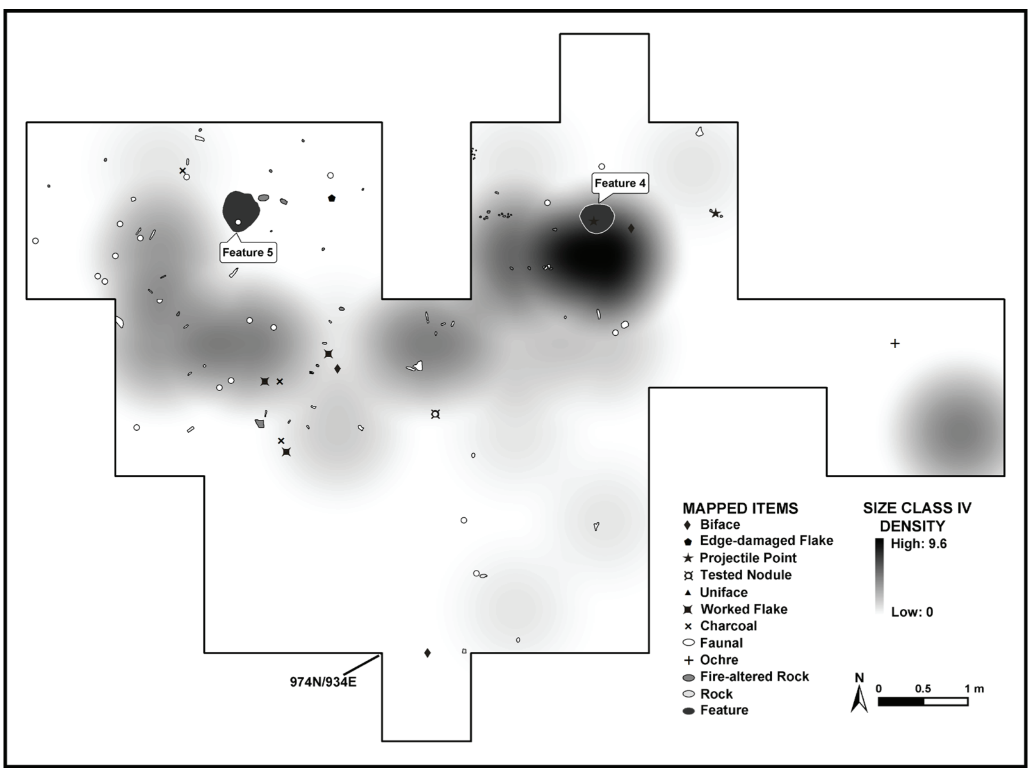


Figure 27: M-Block Size Class IV faunal density.

Table 7: Summary of Faunal Remains by Location

| SIZE CLASS | H-BLOCK n / Row % | M-BLOCK n / Row % | NON-BLOCK n / Row % |
|---|---|---|---|
| I | 35 / 38.5 | 18 / 19.8 | 38 / 41.8 |
| II | 2 / 66.7 | 1 / 33.3 | 0 / 0 |
| III | 214 / 71.6 | 68 / 22.7 | 17 / 5.7 |
| IV | 48 / 42.9 | 52 / 46.4 | 12 / 10.7 |
| Unspecified | 397 / 52.7 | 284 / 37.7 | 73 / 9.7 |
| Flotation | 447 / 82.6 | 94 / 17.4 | 0 / 0 |
| **Total** | **1,143 / 63.5** | **517 / 28.7** | **140 / 7.8** |

with activity areas. Another notable trait of the H-Block bison-sized remains is that all but 12 occur above the level containing Feature 6 and none are in direct association with the feature. This hints at a possible later occupation associated with the Size Class IV remains.

**Vertical Distribution.** As shown in Figure 28, the faunal remains in H- and M-Blocks peak at slightly different levels. Multiple radiocarbon dates were obtained for each feature, as mentioned previously, yet all reliable dates cluster between 900 and 700 B.P. Features 4 and 5 appeared heavily deflated and the higher peak for the M-Block bone may be a reflection of past and/or more recent deflation. The data on all-site faunal and lithic artifact vertical distribution also behave somewhat differently, with the faunal showing a slightly lower peak, with more items at slightly deeper depths than the lithics. Reasons for this variation are not immediately apparent.

## SUMMARY

The bird and rabbits in the 2012 faunal assemblage cannot be unquestionably interpreted as food remains. They lack direct evidence of cut marks, burning, tooth marks, or green breaks. Given the low number of these items (n = 4) there is little in the way of a pattern of element frequency to suggest preparation or consumption practices. Similarly, the small rodents are interpreted as naturally occurring intrusive background fauna based on their near completeness and a lack of the same traits. The canid is interpreted as a domestic dog associated with the prehistoric occupation.

The presence of a fetal pronghorn-sized element raises the minimum number of medium artiodactyls to four, and based on remains at features of differing ages, at least five are likely present. Based on the recovery of bison elements at features of differing ages, coupled with the metric comparison to other Late Prehistoric bison, it is likely that at least two bison are present. Despite minimal direct evidence of butchering, the items are clearly subsistence remains based on breakage patterns and spatial association with hearths. These remains are interpreted as animals harvested in individual or small group encounter hunting events in support of a residential camp that was based at the site. Given the presence of a single fetal bone and an unerupted pronghorn third molar, the Feature 6 area appears to have been occupied during the early to late spring.

Size Class III proximal femora, distal femora, and distal tibiae are absent from the assemblage. One possible cause of this is that they were comminuted for the purpose of bone grease rendering. Martin (2000) suggested that this occurred at the activity area exposed during the 1996 excavations. While this is a possibility, supporting evidence is lacking. As demonstrated above, the size of long bone fragments is not extremely small. Using data from experiments, the ethnographic record, and the archaeological record, it appears that bone grease rendering is associated with small bone fragments and high amount of FAR (Binford 1978; Janzen et al. 2014; Leechman 1951; Outram 2001; Vehik 1977). While there are several accounts of pulverized bones being used for grease rendering, experiments by Church and Lyman (2003) demonstrate that the amount of grease produced increases only slightly with increased bone fragmentation. Furthermore, they note that only a small amount of grease is produced by any of the elements, and that bones may have been boiled not only to yield lipids, but also for trace vitamins, minerals, and fatty acids.

The Carter site lacks many signatures of grease rendering. There is no ground stone, hammerstones, or anvils; there is not a large amount of FAR; and the green broken long bone fragments and impact flakes, as described above, were not broken into small fragments. It is clear that pronghorn processed in and around Feature 6 were roasted. For these reasons, bone grease does not seem a viable explanation for the lack of certain portions of long bones. The presence of the bison upper limb bones with high marrow and oleic fat contents further supports this notion. While it could be suggested that marrow extraction of phalanges is an indicator of nutritional stress, it could also simply reflect casual snacking behavior. The content of oleic fat increases

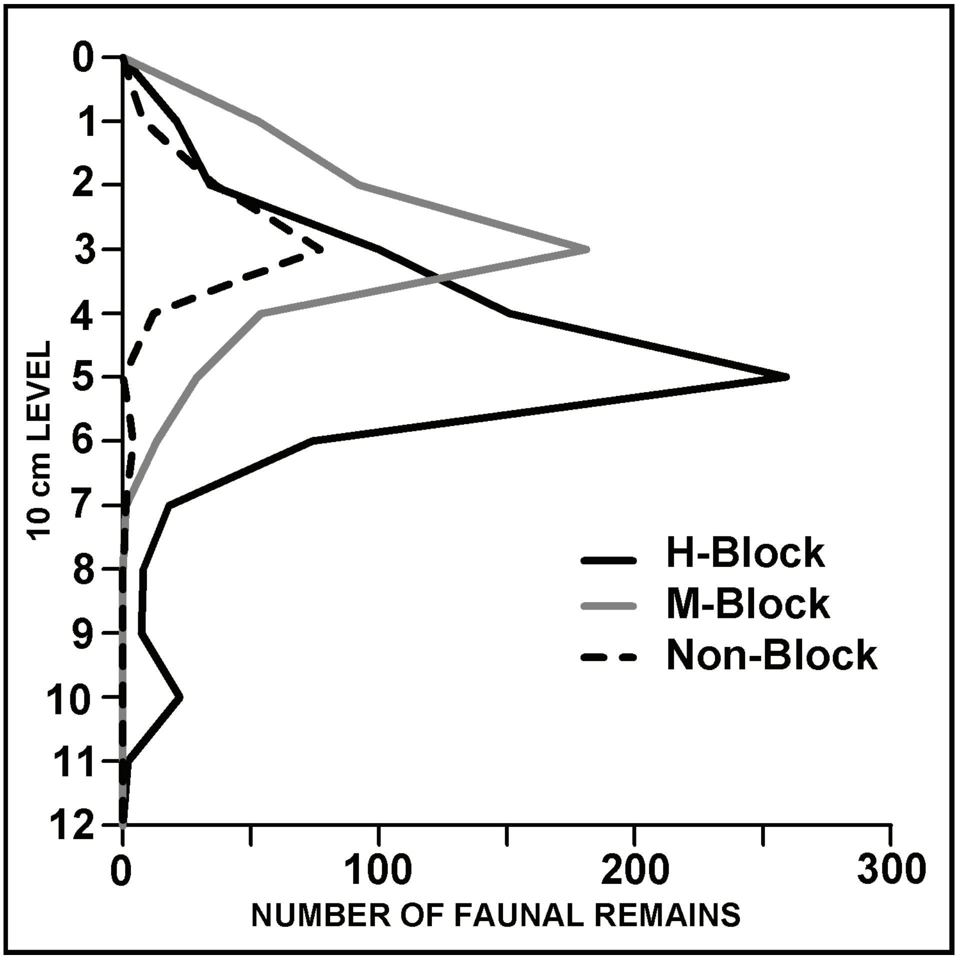


Figure 28: Vertical distribution of faunal remains by excavation location.

moving down the limb (Morin 2007), which would provide a fatty morsel attained by fairly little effort. For these reasons, it appears most likely that meat cooking and casual marrow procurement explains the skeletal element frequencies and associated breakage patterns.

Returning to the pronghorn processed in and around Feature 6, a fairly articulate record of the process was identified during excavation. The large feature is clearly a roasting pit or earth oven, and was used to roast articulated units with the soft tissue remaining on the elements. This left a record of unburned, minimally butchered remains with no disarticulation or defleshing cut marks. This pattern has been observed ethnographically with small and medium mammals (Martínez 2009). After marrow removal, bone ends and articulated joints were disposed of back in the hearth. The much smaller hearths in the M-Block appear to be simple fire features rather than roasting pits intended for extended cooking episodes. These M-Block features were constructed with far less effort and, regardless of meat or marrow cooking methods, lacked the more complex roasting method evident at Feature 6.

## SPATIAL PATTERNS

Given the setting adjacent to Keg Spring Draw and the evidence of at least two Late Prehistoric occupations from the 1996 and 2012 excavations, it would not be surprising if there were multiple occupations reflected in the 2012 block excavations. The distribution of flaked stone and bone does appear to be over-thickened beyond what would be expected by minimal bioturbation and trampling (Figure 29). As described above, Eckerle et al. (2011) suggest that substrates such as the clayey fine sand should have a vertical trampling churn zone of 3 to 8 cm. Rodents can displace artifacts significantly farther, and krotovina were documented during excavations, but these were not sufficiently abundant to explain

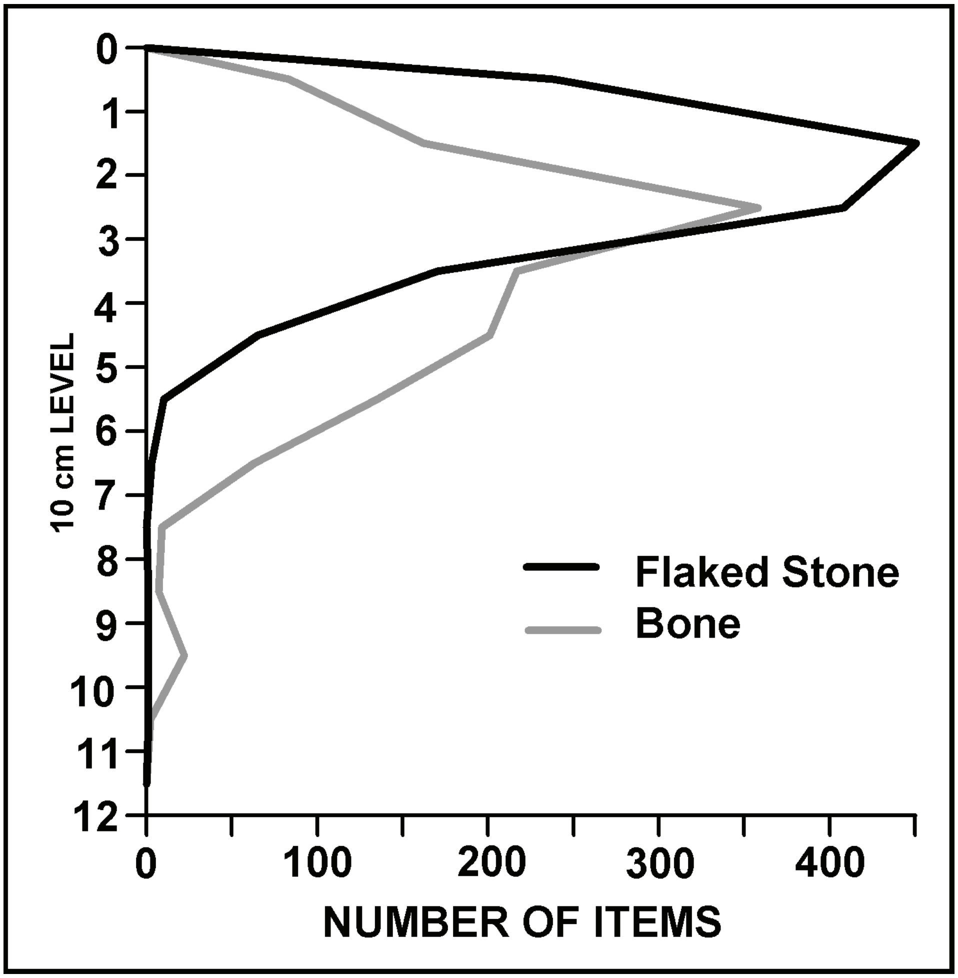


Figure 29: Vertical distribution of flaked stone and bone.

the vertical distribution that was observed. Horizontal scuffing is high in these substrates (Eckerle et al. 2011), and this, combined with slope wash, may account for some of this distribution.

There are no stark differences in the characteristics of the lithic concentrations excavated in 2012. All concentrations are dominated by white metaquartzite (nodule 1) with relatively minor amounts of other material types by comparison. All lithic reduction activities appear to be similar across the excavation areas, with a focus on biface reduction and expedient tool production. If there were significant differences in the vertical distribution of material types or reduction activities, this would support the interpretation of multiple occupations within the excavation blocks. Vertically discrete faunal concentrations would also lend support to this interpretation. Some faunal remains were identified in lower levels within krotovina that had obviously displaced the bones, but this occurred only in a few instances. Nothing in the lithic or faunal assemblages is particularly indicative of multiple occupations. The 900 to 700 B.P. cultural layer, while over-thickened, is represented by a unimodal distribution of artifacts overlying the dark to black Stratum III (see Figure 29). Given these considerations, while the vertical distribution of the cultural layer is not fully understood, the operating interpretation is that the cultural material in the excavation blocks represents horizontally discrete occupations rather than a vertical palimpsest of multiple Late Prehistoric deposits.

**FEATURE 4 AREA**

There are 58 pieces of flaked stone in the 10 units around Feature 4. These include projectile points, modified flakes, one biface, one uniface, and debitage. The four projectile points include the severely burned Late Archaic sized point (see Figure 10.c), the ambiguous but possible McKean lanceolate (see Figure 10.d), and two tips. A large mid-stage biface fragment from nodule 1 is included, along with the refitting nodule 1 uniface. Additionally, three small tan and orange metaquartzite worked flake fragments that appear to have come from the same tool are associated.

The 48 pieces of debitage include 12 different nodules. Most are represented by 1 to 2 flakes, but 15 flakes are from nodule 1, 12 are from nodule 18, and 5 are from nodule 34. These three nodules are all metaquartzite. Comparing the debitage lengths from the Feature 4 area to the remainder of the site using the Mann-Whitney U test, no significant difference is present in the size distribution within this cluster compared to the remainder of the site (p[same] = 0.8678). Water-screened feature fill samples were excluded to ensure comparable sample size distributions. Overall, the lithic assemblage around Feature 4 represents tool maintenance and discard, as well as mid-stage biface reduction.

Faunal remains associated with Feature 4 include 138 specimens. Most (n = 104) are too small to be identified to body size, but of the identifiable specimens, six are pronghorn-sized and 22 are bison-sized. The area directly south of Feature 4 contains the most bison-sized elements in the M-Block. Several fragments exhibit green bone breakage (n = 21), suggestive of butchery. This Feature 4 area contains the most burned faunal elements in the M-Block (n = 22), but it is unclear whether these fragments were burned during cooking or were incidentally burned by being located adjacent to the hearth. Regardless of the source of the burned bone, the number of faunal elements associated with this feature does suggest that meat processing and cooking was a function of Feature 4. The minimal FAR and shallow nature of this feature suggests that whatever processing took place likely did not involve prolonged roasting.

### FEATURE 5 AREA

There is a large concentration of flaked stone south of Feature 5 (see Figure 6). As a result, 24 units spanning the western and central portions of the M-Block are included in the analysis of the Feature 5 activity area. This concentration includes 477 pieces of flaked stone, including mid- and late stage bifaces, modified flakes, debitage, and a tested cobble that may have also functioned as a chopper. Notably, unlike the much smaller concentration around Feature 4, this concentration includes no projectile points.

The mid- and late stage biface fragments are both the common white metaquartzite (nodule 1). Of the nine modified flakes in this concentration, three are edge-damaged and six are worked. Two are from the multicolored chert nodule 2, and the others are from nodule 1. The tested cobble/chopper was excavated in the eastern portion of this concentration. This expedient, minimally modified cobble is the only artifact excavated in 2012 that has been identified as a possible tool used to break long bones for marrow extraction.

The 465 pieces of debitage in this activity area include 13 different nodules, but by far most are represented by nodule 1 (n = 402, 86 percent). Nodule 2 is represented by 26 flakes, and the remainder is represented by five or fewer pieces of debitage. The two flakes from Obsidian Ridge, New Mexico, were excavated on the eastern side of this concentration. Interestingly, the one small ceramic sherd excavated in 2012 was present in the same unit as one of these obsidian artifacts.

Comparing the debitage lengths from the Feature 5 area to the remainder of the site using the Mann-Whitney U test, some differences are present in the size distribution within this cluster compared to the remainder of the site, although these differences are not statistically significant (p[same] = 0.1457). Taken as a whole, the Feature 5 activity area debitage assemblage is somewhat smaller than the remainder of the debitage. The size distribution in the flakes around Feature 5 is more tightly clustered than that from the remainder of the site.

Faunal remains associated with this activity area include 262 specimens, and like Feature 4, most are unidentifiable to body size (n = 168). Two are specifically identifiable to pronghorn, 52 are pronghorn-sized, and 23 are bison-sized. This area contains the highest concentration of Size Classes III and IV long bones in the M-Block, as well as those elements exhibiting green bone breakage (n = 36). A few are burned (n = 4). Given this assemblage, bison and pronghorn butchery, including marrow extraction, was a focus of activities in this area. This assemblage also includes 17 rodent-sized elements that lack evidence of cultural modification and are assumed to be intrusive.

**FEATURE 6 AREA**

The Feature 6 activity area encompasses six units. Including the 51 pieces of debitage in the Feature 6 floatation sample, this area contains 112 pieces of flaked stone. The floatation sample is included in the general summary of this area, but because of the large number and the small screen size used to recover these microflakes, they are excluded in the comparisons of flake sizes between this area and the remainder of the site. This concentration includes mid- to late stage bifaces, modified flakes, one uniface, and one projectile point. The medial fragment of a Late Prehistoric side-notched point (see Figure 10.b) was recovered northeast of Feature 6. Two mid-stage biface fragments were in this area. One is silicified sediment and the other is metaquartzite. The one late stage biface fragment is metaquartzite. All of these fragments are small (less than 25 mm in length). Of the six modified flakes, three are edge-damaged and three are worked. Edge-damaged flakes include a Morrison quartzite flake fragment, a white metaquartzite fragment, and a tan chert fragment. The one small uniface fragment (discussed above) is purple silicified sediment that is associated with a mid-stage biface fragment and three flakes, suggesting it may have been manufactured during the use of Feature 6.

The 100 flakes in this area include 17 nodules, which is a fairly high number of nodules considering the relatively low amount of debitage. Most of the nodules are represented by five or fewer items. Nodule 18 is a gray metaquartzite that is represented by 19 pieces of microdebitage recovered from feature fill waterscreening, along with two flakes in adjacent units. Nodule 1 is represented by 18 flakes, including three from feature fill. Morrison quartzite (nodule 6) is represented by 12 flakes, 9 of which were in feature fill. Lastly, nodule 38 is a tan metaquartzite that is represented by 8 flakes, none of which were feature fill. Comparing the debitage lengths from the Feature 6 area to the remainder of the site using the Mann-Whitney U test, no significant difference is present in the size distribution within this cluster compared to the remainder of the site (p[same] = 0.159), but as was the case with the Feature 5 area, the size distribution of debitage in this cluster is somewhat smaller than the remainder of the site. Water-screened feature fill samples were excluded to ensure comparable sample size distributions. Overall, the lithic assemblage around Feature 6 represents mid-stage to late stage biface reduction. Large flakes are absent from this activity area.

The Feature 6 area contains most of the faunal assemblage in the H-Block. This area includes 430 faunal elements, and as is the case with the other feature concentrations, most are unidentifiable to body size class (n = 273). Six are bison-sized, and 42 are identified specifically as pronghorn. Another 109 could not be speciated but are pronghorn-sized and assumed to be pronghorn. Most of these elements are located within Feature 6, and many of these lack burning. As mentioned above, this suggests the elements roasted in the feature were still encased in soft tissue. That being the case, 95 elements in this concentration are burned, and all are within or directly adjacent to Feature 6. Marrow extraction is demonstrated by the concentration of green-broken elements (n = 82) and impact flakes (n = 22).

**NORTHWEST H-BLOCK AREA**

A small concentration of lithic and faunal remains is present in the northwest corner of the H-Block (see Figures 7, 22, and 24). This includes three units. This area contains 70 pieces of flaked stone, including three modified flakes and debitage. Nine nodules are represented by the debitage, and most are represented by four or fewer items. A gray metaquartzite nodule is represented by 32 flakes (48 percent), and nodule 1 is represented by 17 flakes. The brown and tan chert assumed to be Green River or Bridger chert (Miller 2010) is represented by eight flakes. A Mann-Whitney U test indicates the size distribution of debitage from this concentration is essentially the same as that of the remainder of the site (p[same] = 0.8028). The lithic assemblage appears to represent mid- to late stage biface reduction. Four chert artifacts retain cortex, and one of these retains attributes of biface thinning.

Faunal remains associated with this activity area include 73 elements, most of which are unidentifiable to body size (n = 38). Two are specifically identifiable to pronghorn, and another 19 are pronghorn-sized. Bison-sized elements include 13 specimens, most of which are rib fragments. Several elements are green broken (n = 23), and a few are burned (n = 7). FAR is located in this concentration, and considering this, the burned elements, and the number of artifacts in this area, it is likely that a feature was present to the west or northwest of this area outside of the excavation block, and that this concentration represents the outer margins of another hearth-centered activity area.

**CENTER H-BLOCK AREA**

A notable concentration of lithic material is present in the center of the H-Block (see Figure 7). This includes seven units. This area contains 358 pieces of flaked stone, including one mid-stage biface, modified flakes, and debitage. The mid-stage biface fragment is from nodule 1. The 15 modified flakes are predominantly from nodule 1 as well, and include 10 edge-damaged flakes and five worked flakes. Two of the modified flakes are from Green River/Bridger chert, one is a brown metaquartzite, and another is a large complete Morrison quartzite edge-damaged flake.

The 342 flakes in this area include seven nodules, which is a low number considering the number of flakes present in other concentrations. Most of the nodules are represented by one or two items. Nodule 1 is represented by 330 flakes (96 percent). Comparing the debitage lengths from this concentration to the remainder of the site using the Mann-Whitney U test, a significant difference is present in the size distribution within this cluster compared to the remainder of the site (p[same] = 0.02616). Taken as a whole, the central H-Block concentration contains significantly fewer small flakes than the remainder of the assemblage excavated in 2012. By far, the dominant activity in this area was the reduction of mid-stage nodule 1 bifaces. Modified flakes removed during this reduction appear to have been put to use for some type of activity in this area. The lack of features, rock, or significant amounts of faunal remains in this area suggests this concentration is defined primarily by lithic reduction and the production of modified flakes.

Faunal remains overlapping with this lithic concentration include 49 elements, 24 of which are unidentifiable to body size. One is identifiable specifically to pronghorn, and two others are pronghorn-sized. There are several bison-sized elements (n = 17), but most are tooth enamel fragments. Three of the bison-sized elements are green broken, including a humerus, a metatarsal, and a long bone flake. Six other elements are green broken as well. Five rodent-sized elements are in this concentration and are not assumed to be related to the cultural occupation. While most of the cultural material in this concentration is lithic material, the faunal remains indicate that some bison and pronghorn elements were butchered in this area.

## CONCLUSIONS

Going into the 2012 fieldwork, the expectations were that a cultural deposit similar to the 1996 excavations would be encountered. While the 2012 assemblage dates to a similar time within the Late Prehistoric period, there are several notable differences from the 1996 sample. First, the three features in the 2012 sample date to 900 to 700 B.P., in contrast to the 1996 sample dated to 580 ± 60 B.P. Second, the Waltman Brown ware that was one of the most notable discoveries from the 1996 excavations was not encountered. The single ceramic sherd in the 2012 sample may be an entirely different ware. Third, the artifact density in the 1996 block is much higher than what was encountered in 2012. While the density is strikingly different, certain aspects of the lithic assemblage are comparable, notably the gray to white quartzite dominating both samples. The faunal assemblages are also generally comparable, with both showing a focus on secondary pronghorn and bison processing. Notably, both contain the remains of possible domesticated dogs.

**PALEOENVIRONMENT AND STRATIGRAPHY**

Excavations focused on the western terrace of Keg Spring Draw, south of 1996 block excavations conducted by Mariah. The southwest-trending intermittent draw is flanked by floodplain riparian grasses and sedges, with sagebrush dominating the upper terrace slopes. Charcoal samples from Features 4 and 6 were speciated to whitebark or limber pine. The nearest mapped evergreen forest is currently 1.15 miles northeast of the site, on sheltered upland north-facing slopes in the Powder River Draw watershed. In contrast, charcoal from Feature 5 was speciated to big sagebrush. Given the abundance of sagebrush in the immediate vicinity, it seems unlikely that the pine fuels would have been transported over 1 mile to this site. Rather, we suggest that this pine charcoal reflects fuels that were available onsite or near the site at the time of occupation. Otherwise, the high cost of transporting pine logs over 1 mile would have likely led to locally available sagebrush being used instead.

If pine trees were present in the vicinity at the time of the Late Prehistoric occupations, they were likely supported by a higher water table and increased output from Keg Spring Draw, as water is a primary limiting factor in tree growth in this region. These trees may have died from water stress during the Medieval Warm Period, which occurred around 1,000 to 700 years ago (Graumlich 1993; Mason et al. 2004). Mason et al. (2004) documented a hydrological drought tied to a reduction in the water table during this period in the Nebraska Sand Hill in response to regional drying, and they demonstrate several examples across the Great Plains and adjacent areas. Across the region, this drying allowed dune fields to be reactivated. At the Carter site, this dryness and lowering water table may have caused tree stands to be reduced to the more sheltered settings receiving more effective precipitation through reduced evapotranspiration rates.

The stratigraphy at the Carter site is consistent with this response to the Medieval Warm Period. The very dark to black Stratum III underlying the cultural deposit contains organic-rich humus and may reflect a higher water table during the Late Neoglacial (1800 to 900 B.P.) preceding the Medieval Warm Period (Laws and Eckerle 1998). Laws and Eckerle (1998) interpret this to be a slope wash deposit, and a significant amount of water must have been available for the rich plant growth that formed this humus. Drying, likely from the Medieval Warm Period, is evident in the deposits overlying Stratum III, which are much lighter and contain more aeolian loess. This shift appears to have been rapid, as the contact between Strata III and IV is abrupt. The changes to the depositional regime may also be related to the down-cutting of Keg Spring Draw. As the draw cut into deeper strata, the ground water likely lowered and reduced the amount of organic growth that led to the formation of the Stratum III humus. Subsequent drying may have activated aeolian deposition and slope wash, which was occurring during site occupation and would eventually bury the cultural layer.

## FEATURES AND FIRE-ALTERED ROCK

The feature excavated in 1996 (Feature 1) was dated to 580 ± 60 B.P., while multiple dates on the features excavated in 2012 are indicative of occupations from 900 to 700 B.P. (excluding the one errant date of 1014 ± 24 from Feature 4). The single occupation excavated in 1996 therefore appears to have occurred at least 100 years after the occupations sampled in 2012, and possibly 200 to 300 years later given the uncertainty in the radiocarbon assays.

Feature 4 is a shallow feature associated with bison and pronghorn processing. Several pieces of burned bone are associated, but the origin of this burning is unclear and the bone may have become burned incidentally by proximity to the hearth. Few pieces of FAR are associated, and it does not appear to have been used for roasting with sustained low heat.

Feature 5 also has only a few pieces of associated FAR, but a concentration of butchered pronghorn-sized elements and fewer bison-sized elements is directly south of the feature. Most of these elements were long bones, and given the number of green broken elements in this concentration, marrow extraction appears to have been one of the activities associated with Feature 5. The tested cobble with a possible chopper edge that was excavated in this area may have been used for this marrow extraction. Similar to Feature 4, the shallow feature depth and minimal FAR suggests that Feature 5 was not used for sustained roasting.

Most of the FAR is associated with Feature 6, which primarily appeared to function as a pronghorn roasting pit. This feature is much larger and deeper than Features 4 and 5. The large amount of FAR in this feature is indicative of a heating element that was used to sustain temperatures during roasting. The lack of FAR outside of this feature suggests that the hearth likely was not reused, because if the feature (and rock heating elements) had been cleaned out for refueling, there would likely be a scatter of FAR adjacent to the feature.

A concentration of FAR in the northwest corner of the H-Block, along with associated bone and flaked stone in this area, suggests a hearth may have been present to the northwest of this block.

## LITHIC TECHNOLOGY

Comparing the 2012 lithic assemblage to the

1996 assemblage highlights many differences and a few similarities. The 5,307 pieces of flaked stone from the 1996 assemblage came from 94 units, averaging 56.5 artifacts per unit. In contrast, the 1,417 pieces of flaked stone from the 2012 assemblage were excavated from 107 units, averaging only 13.2 artifacts per unit.

Martin (2000) describes the abundant flaked stone in the 1996 sample as gray quartzite likely procured from the Madison formation on Sioux or Cottonwood passes, 20 to 25 miles to the northwest. Alternatively, the source may have been from secondary deposits along Badwater Creek. While we cannot be certain, this gray quartzite may be the same material as nodule 1 in the 2012 sample, which we describe as more white in color. This quartzite comprises 74 percent of the 2012 sample. The organization of technology as described by Martin (2000) is similar to the interpretations of the 2012 sample, in that bifaces were produced at the source and were brought to the site and used to produce expedient flake tools.

The 2012 surface sample included obsidian from Malad, Idaho, and Obsidian Cliff in Yellowstone. The two pieces from the excavations were from Obsidian Ridge, New Mexico (Hughes 2014). A piece of non-volcanic glass consistent with the Powder River source area in southern Montana was also recovered in 2012. The 1996 obsidian sample was derived entirely from Obsidian Cliff in Yellowstone. Yellowstone and Malad obsidian is not entirely atypical on sites in central Wyoming, but material from Obsidian Ridge, New Mexico, is not at all common. While it is tempting to suggest that these artifacts are indicative of a seasonal round traveled by mobile foragers, such a conclusion would be more founded if drawn from a large-scale inter-site analysis. Alternatively, the artifacts could have been traded and/or represent highly curated "heirloom" nodules that are not reflective of seasonal movements.

## FAUNAL REMAINS

Based solely on skeletal element representation, the faunal remains recovered in 2012 represent minimally 14 animals in seven different taxonomic categories, including one gastropod, one grouse-sized bird, one cottontail, five small rodents, one jackrabbit, one canid, three pronghorn, and one bison. The bird and small mammals cannot be unquestionably interpreted as food remains. The canid is interpreted to be a domestic dog associated with the prehistoric occupation.

The presence of a fetal pronghorn-sized element raises the number of medium artiodactyls to four, and based on the range in radiocarbon dates from the features associated with the remains, there is a possibility that five are present. Based on the recovery of bison elements at these differently aged features, coupled with the metric comparison to other Late Prehistoric bison, at least two bison are likely present. Despite minimal direct evidence of butchering, the pronghorn and bison elements are clearly subsistence remains based on breakage patterns and spatial association with hearths. These remains are interpreted as animals harvested in individual or small group encounter hunting events in support of a residential camp. Based on the presence of a single fetal bone and a pronghorn unerupted third molar, the occupation associated with Feature 6 is estimated to have been in the early to late spring.

Martin (2000) suggested that bone grease rendering occurred at the activity area north of the current investigations. Supportive lines of evidence for this type of activity are lacking at these newly excavated activity areas. The size of long bone fragments is not extremely small; there is no ground stone, hammerstones, or anvils; and with the exception of Feature 6, there is not a large amount of FAR. It is clear that pronghorn processed in and around Feature 6 were roasted. For these reasons, bone grease rendering does not appear to have taken place at the newly excavated portions of the site. Rather, it appears long bone reduction was focused on marrow extraction.

## THE CARTER SITE IN CONTEXT

The Carter site has been mainly known for the Late Prehistoric occupation that produced the Waltman Brown ware in 1996; however, the Late Paleoindian to Late Prehistoric projectile points documented on the surface demonstrate that the site was a favorable setting for prehistoric occupations over thousands of years. The 2012 excavations revealed additional Late Prehistoric hearth-centered activity areas, primarily representing lithic reduction in support of bison and pronghorn butchery. The single ceramic sherd excavated in 2012 is associated with an earlier deposit than was excavated in 1996, and while inconclusive because of being a single artifact, its matrix is very dark gray, not micaceous, and does not appear to represent Waltman Brown ware.

Both the 1996 and 2012 excavations revealed a lithic assemblage indicative of primarily expedient technologies but with some curated implements. Early to mid-stage bifaces appear to have been prepared at the toolstone source areas and brought to the Carter site for the production of predominantly expedient tools. That this occurred during all of the excavated Late Prehistoric occupations points to a repeated pattern of tool procurement and subsequent reduction. The focus on expedient flake tools and a veritable lack of formal tools in all excavated samples speaks to the consistent organization of technology during the Late Prehistoric between 900 and 500 B.P. Large-scale inter-site studies into the changes in this organization as it relates to toolstone source distance and raw material availability would lend much needed insight regarding how this organization changed in response to resource availability during this time period.

Opportunistic pronghorn and bison hunting appears to have been a focus of activities in this area during the Late Prehistoric period. All hearths at the Carter site are adjacent to butchered remains of one to a few animals. Smith and McNees (2000) note that large pronghorn bonebeds in the Wyoming Basin garner much attention, and notions of large-scale communal hunting, sometimes involving structures, are commonly attributed to Late Prehistoric hunters of the region. However, they go on to note that given the rarity of such sites and the inflated attention they receive, this leads to an unbalanced synthesis of the period. Rather, they assert that the more accurate scenario is one of the pursuit of individual pronghorn, and bison when available, by individuals or small groups, not in a large, communal effort (Smith and McNees 2000). In support of this concept, they demonstrate most sites typically contain just a few large mammals. That is precisely the pattern at the Carter site: individual or small group encounter hunting of pronghorn and bison in support of a residential base.

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**Data Availability Statement.** Artifacts, photographs, and field notes from the 2012 excavations are located at the University of Wyoming Archaeological Repository. The original excavation report is on file at the Wyoming State Historic Preservation Office. Additional data and photographs are on file at the SWCA Environmental Consultants Fort Collins office.

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