TUFA VILLAGE (NEVADA): PLACING THE FORT SAGE DRIFT FENCE IN A LARGER ARCHAEOLOGICAL CONTEXT

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JAMES A. CARTER

We dedicate this work to the memory of
James A. Carter (1962–2013),
a wonderful archaeologist and dear friend.

CONTENTS

ABSTRACT

The Fort Sage Drift Fence is one of the largest pre-Contact rock features known in the Great Basin, and appears to date between 3700 and 1000 cal B.P. When Pendleton and Thomas (1983) first recorded the 2 km long complex, they were impressed by its sheer size and the amount of labor required to build it. This led them to hypothesize that it must have been constructed, maintained, and used by specialized groups associated with a centralized, village-based settlement system—a system that was not recognized in the archaeological record at that time. Their hypothesis turned out to be quite insightful, as subsequent analyses of faunal remains and settlement pattern data have documented the rise of logistical hunting organization linked to higher levels of settlement stability between about 4500 and 1000 cal B.P. throughout much of the Great Basin. Although Pendleton and Thomas' (1983) proposal has been borne out on a general, interregional level, it has never been evaluated with local archaeological data. This monograph remedies this situation through reporting the excavation findings from a nearby, contemporaneous house-pit village site. These findings allow us to place the drift fence within its larger settlement context, and provide additional archaeological support for the original Pendleton-Thomas hypothesis.

INTRODUCTION

The Fort Sage Drift Fence is one of the largest prehistoric rock features known in the Great Basin. First documented by Pendleton and Thomas (1983), it is composed of multiple rock alignments spanning, with purposeful gaps, a linear distance of more than 2 km (fig. 1). Most of the feature was originally mapped by Pendleton and Thomas (1983), but the easternmost segment was discovered via aerial imagery and ground-truthing by the lead author and colleagues in 2010. The substantial walls commonly approach a meter in height and width (fig. 2), with rock sizes varying from small cobbles to large boulders, many of which would have required several people to move and place. Bedrock and naturally occurring boulders are also incorporated into the structure's alignment. The western and central portions of the fence are well designed and constructed, using mainly flattish rocks for the external structure, and rubble fill for the interior (fig. 3). Elsewhere, especially along the eastern portion of the fence, construction techniques are less formal, consisting of stacked rocks using more-rounded boulders. Whether the two techniques represent different phases of construction, or simply differences in available parent rock along the alignment, is unknown at this time. There is no doubt, however, that Pendleton and Thomas (1983: 30) are correct in stating that construction of the feature was a labor-intensive activity, a conclusion more recently supported by an experimental reconstruction of a portion of the fence showing that it would have required roughly 210 person-days to build the entire facility (Hockett et al., 2013).

Upon arriving at the Drift Fence, visitors typically think that they have come across a historic-era facility, concluding that it must have been built by an early military regiment (the "fort" of Fort Sage), with ranch labor, or by someone with similar horsepower and/or time. Because the fence was larger than any of the Native American features they had studied previously, Pendleton and Thomas had similar feelings about the feature complex. Intensive survey, however, failed to reveal any historic-era artifacts; in fact, they found that prehistoric loci were clearly clustered along the walls and at the handful of openings (Pendleton and Thomas, 1983: 20). Dating the construction and use of the Drift Fence relied on the projectile point assemblage documented within the loci along the feature. The assemblage included an equal number of Gatecliff and Elko

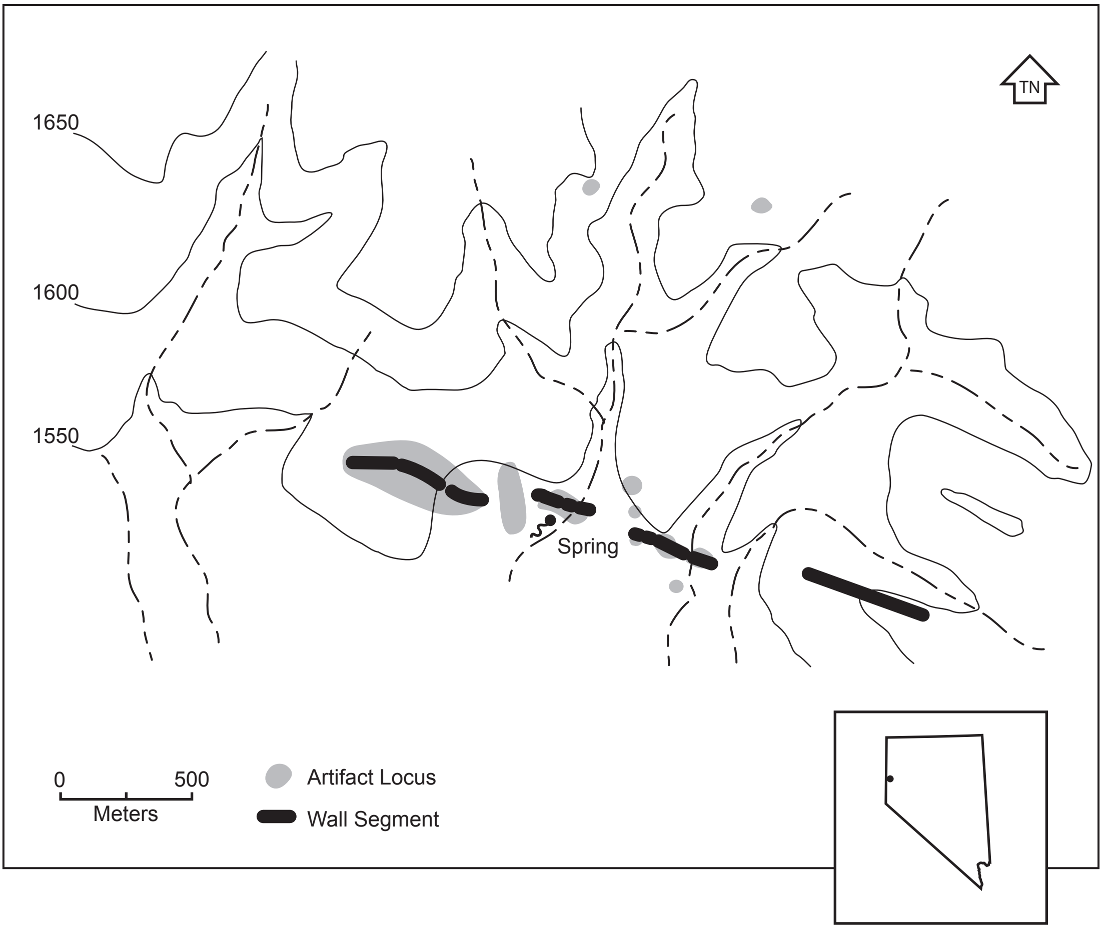

FIG. 1. Map of the Fort Sage Drift Fence.

series points (circa 5000–1300 cal B.P.), several dart-sized leaf-shaped points, and a lesser number of Rosegate forms (ca. 1300–600 cal B.P.). Later-dating Desert Side-notched and Cottonwood series points (post-600 cal B.P.) were absent. This mix of projectile points led Pendleton and Thomas (1983) to conclude that the feature was constructed and used sometime after 5000 cal B.P., and fell into disuse well before 600 cal B.P. In support of their local chronology, Pendleton and Thomas' (1983: 31–32) review of rock alignments from throughout the Great Basin showed that they, too, were dominated by a mix of Gatecliff and Elko points, followed by lesser numbers of Rosegate forms, and much lower frequencies of Desert Side-notched and Cottonwood series points.

A more recent study of stone fences, and fences and corrals made from either wood or combinations of wood and stone, produced similar results regarding the origin of these facilities (Hockett et al., 2013). Large Side-notched points (ca. 7800–5000 cal B.P.) are rarely found with them, whereas later-dating Elko, Gatecliff, and Humboldt forms are quite common. Hockett et al. (2013) also found that features made exclusively of stone were more often associated with earlier point types than with those made from wood, where Desert series points were relatively more common.

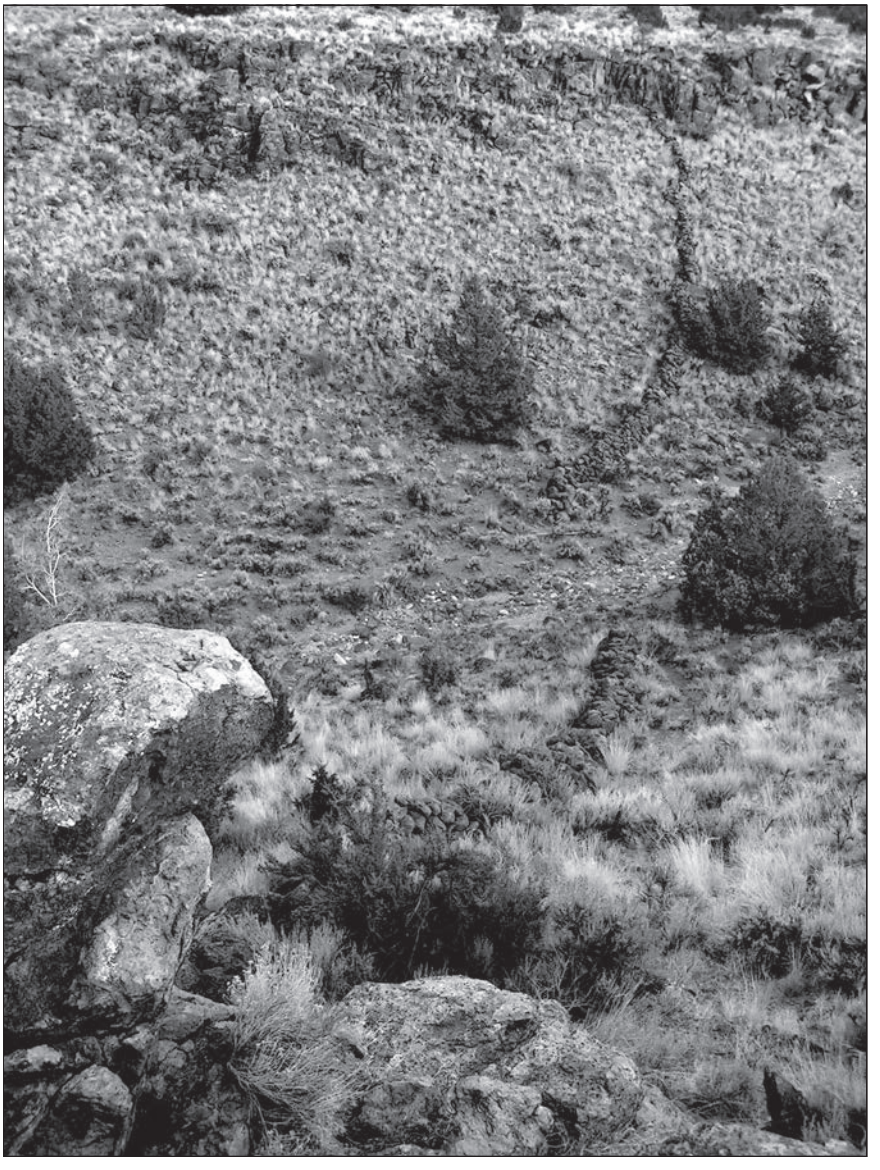

FIG. 2. Segment of the Fort Sage Drift Fence.

FIG. 3. Rubble-fill construction pattern of the Fort Sage Drift Fence.

In an attempt to explain the origin of these massive stone-made facilities, Pendleton and Thomas (1983) turned to Binford's (1980) forager-collector continuum. According to Binford (1980), *foragers* tend to deal with the spatial incongruity of resources by using relatively high levels of residential mobility. With such a strategy, "the costs of constructing expensive residential and extractive facilities are generally outweighed by the advantages of simply moving to new resource patches" (Pendleton and Thomas, 1983: 30). Although Pendleton and Thomas (1983) emphasize that Great Basin populations used adaptive strategies that encompassed much of Binford's (1980) continuum depending on a variety of environmental and social variables (Thomas, 1983), the majority of ethnohistoric data, and most interpretations of the prehistoric archaeological record at the time, indicated that people occupied the forager end of the spectrum most of the time.

These considerations led Pendleton and Thomas (1983) to reason that a significantly different adaption must have led to the construction of the Fort Sage Drift Fence. Continuing with the ideas of Binford (1980), they state that *collectors*:

> follow a strategy of minimal residential mobility, commonly transporting critical resources to consumers through a logistic network of specialized, short-term task groups. The collecting strategy in general played out on landscapes with high density, high predictability resources. For the collector, it makes good cost/benefit sense to construct relatively permanent—and archaeologically visible—facilities for residence, maintenance, extraction, and storage. (Pendleton and Thomas, 1983: 30)

Because the Fort Sage Drift Fence was a costly, labor-intensive facility, Pendleton and Thomas (1983) concluded that it was probably constructed by logistically organized hunters, and that a high-density, predictable resource base was successfully hunted there for a long period of time.

These conclusions were quite insightful for their time (more than three decades ago), as subsequent analyses of faunal remains and settlement pattern data have documented the rise of logistically organized, large-game hunting in many parts of the Great Basin between about 4500 and 1000 cal B.P. (McGuire and Hildebrandt, 2005; Hockett, 2007; Broughton et al., 2008; Hockett and Murphy, 2009; McGuire et al., 2012), which matches the estimated age of the Fort Sage Drift Fence (see also Hockett, 2005). This development has also been linked to major increases in the production of hunting-related rock art and the exchange of obsidian used to manufacture implements for the hunt (Hildebrandt and McGuire, 2002). The requirement for "high density, high predictability resources" has also played out, as several researchers have argued that the rise of logistical hunting was made possible by increases in large game populations due to favorable climatic conditions that developed during the late Holocene (Byers and Broughton, 2004; Broughton et al., 2008).

Although Pendleton and Thomas (1983) presaged these archaeological findings on a general, interregional level, their hypotheses about the type of game that was hunted at the Fort Sage Drift Fence, and expectations about the "facilities of residence" associated with the fence, have never been evaluated with local archaeological data. The purpose of this monograph, then, is to present the excavation results from a Middle Archaic residential site (i.e., a "facility of residence" [Pendleton and Thomas, 1983: 30]) located not far from the Fort Sage Drift Fence (Young et al., 2009). It was occupied between about 3700 and 2800 cal B.P. and provides a clearer picture of the local settlement system that was in place while the fence was used. Piecing together this system not only realizes the original predictions of Pendleton and Thomas (1983), but also provides additional evidence for the unique, collector-based systems that emerged after 5000 cal B.P. in many parts of the western Great Basin.

FINDINGS FROM TUFA VILLAGE

Tufa Village (26WA2460) is located on the southeastern edge of Honey Lake Basin about 8 km north of the Fort Sage Drift Fence (figs. 4, 5). It lies within a sandy alluvial fan originating on the wave-cut mountain front of the Fort Sage Mountains and is associated with a series of large tufa outcrops (some 10 m in height) that provide protection from the northwest wind (fig. 6). Four loci are scattered around the tufa outcrops. Although some excavation occurred at all four loci, Locus 1 and Locus 3 are the primary residential areas at the site and the focus of this study.

The purpose of our excavations was to mitigate impacts associated with construction of a water pipe, 24 inches in diameter, across the site. The pipeline alignment crosses through Locus 1 and Locus 3 in an east-to-west orientation (fig. 6).

Field Methods

Fieldwork at 26WA2460 began with the establishment of a grid system aligned to true north. We then conducted a surface reconnaissance of the site to verify locus boundaries and collect all formed tools from the surface. Based on the findings, the excavation program was initiated, beginning with backhoe trenching and overburden removal, followed by controlled hand excavations of midden deposits and a variety of domestic features (fig. 6; table 1). Following the excavations, detailed stratigraphic profiles were drawn at all of the exposures, and flotation samples were collected from all appropriate feature locations.

Locus 1: A north-south–oriented backhoe trench (Trench 1) was excavated at Locus 1 in an area showing a relatively high surface concentration of flaked stone tools and debitage, and a few pieces of fire-affected rock and milling gear (fig. 6). The backhoe trench encountered a midden

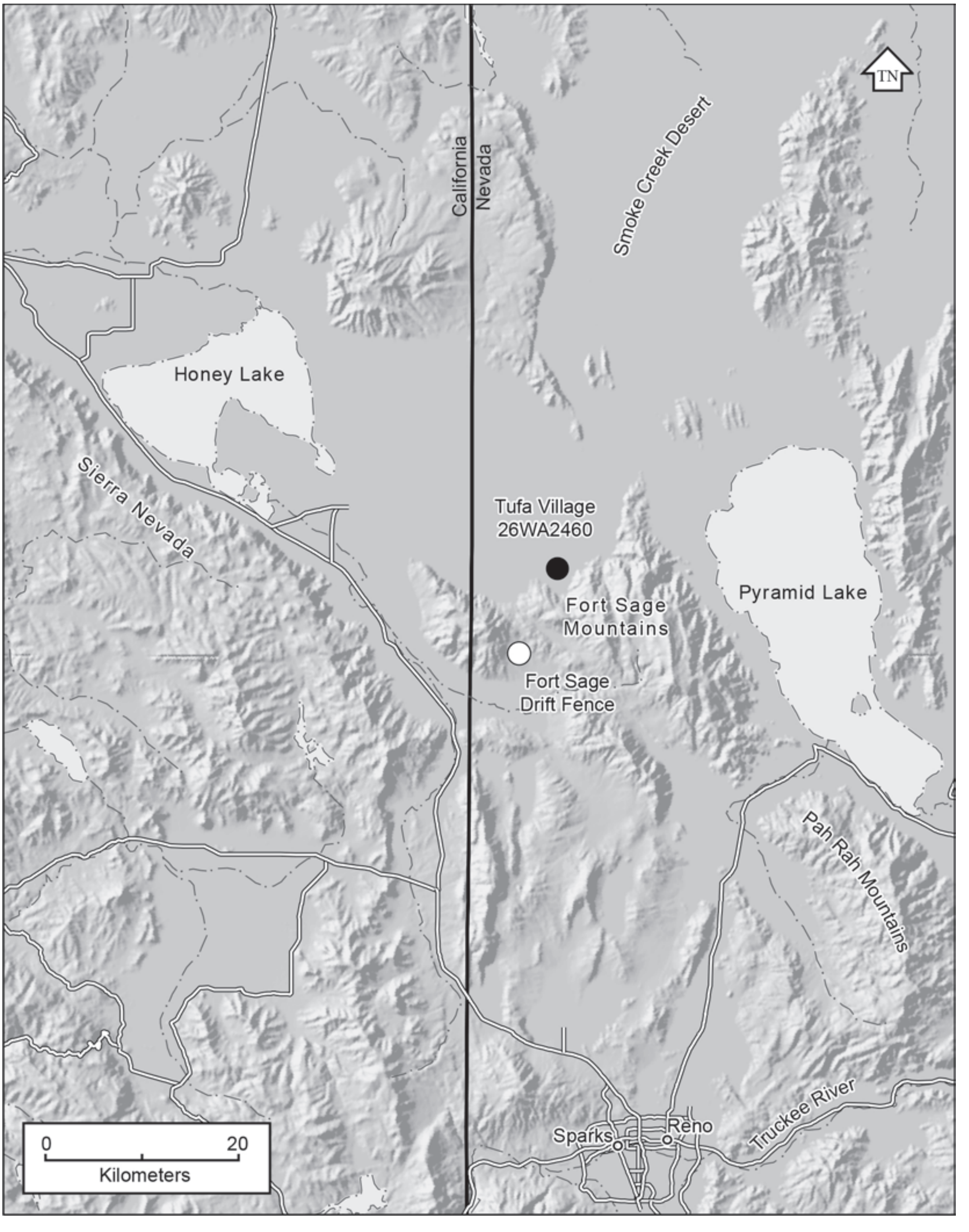

FIG. 4. Location of Tufa Village (26WA2460) and the Fort Sage Drift Fence.

FIG. 5. Overview of Tufa Village looking north toward the southeast margins of Honey Lake Basin; Skedaddle Mountains in the background.

deposit slightly below the surface, with most of the deposit concentrated at the south end of the exposure. A 10 × 10 m surface scrape was carefully excavated to a depth of 10 cm from the western edge of the trench with a 4 ft flat-bladed mechanical bucket to see if any features or concentrations of milling gear were associated with the midden. None of these materials were encountered within the scrape, so two 1 × 2 m units (N1/E54 and N3/E54) were excavated along the southern end of the trench (table 1). The southernmost unit was excavated to a depth of 80 cm below surface, well into the submidden sands. The other unit cleared the midden at 60 cm below surface.

Locus 3: Surface reconnaissance of Locus 3 found a concentration of flaked stone tools, debitage, and fire-affected rock along its northeastern margins. This area was explored with three backhoe trenches, surface scrapes, and 20 hand excavation units.

The first trench (Trench 3) was cut in an east-west orientation along the southern margin of the artifact concentration, and encountered midden soils at the west end. In addition to the midden, the outline of a possible house pit (Feature 3) was observed between 40 and 50 cm below the surface. The darkened floor zone was observed in both sidewalls, indicating that the feature was bisected by the trench. Most of the midden observed in the trench profile was located about 20 cm below an accumulation of largely sterile sediments. Using the trench profile as our guide, we carefully scraped off a 20 × 10 m area to the north of Feature 3 using the 4 ft flat-bladed bucket. This effort was quite successful, exposing a 4 × 6 m concentration of ground and battered stone tools roughly 10 m north of Trench 3 which we designated the Milling Area (fig. 6).

Based on these findings, five hand excavation units were used to expose the house floor at Feature 3, while the Milling Area was sampled with

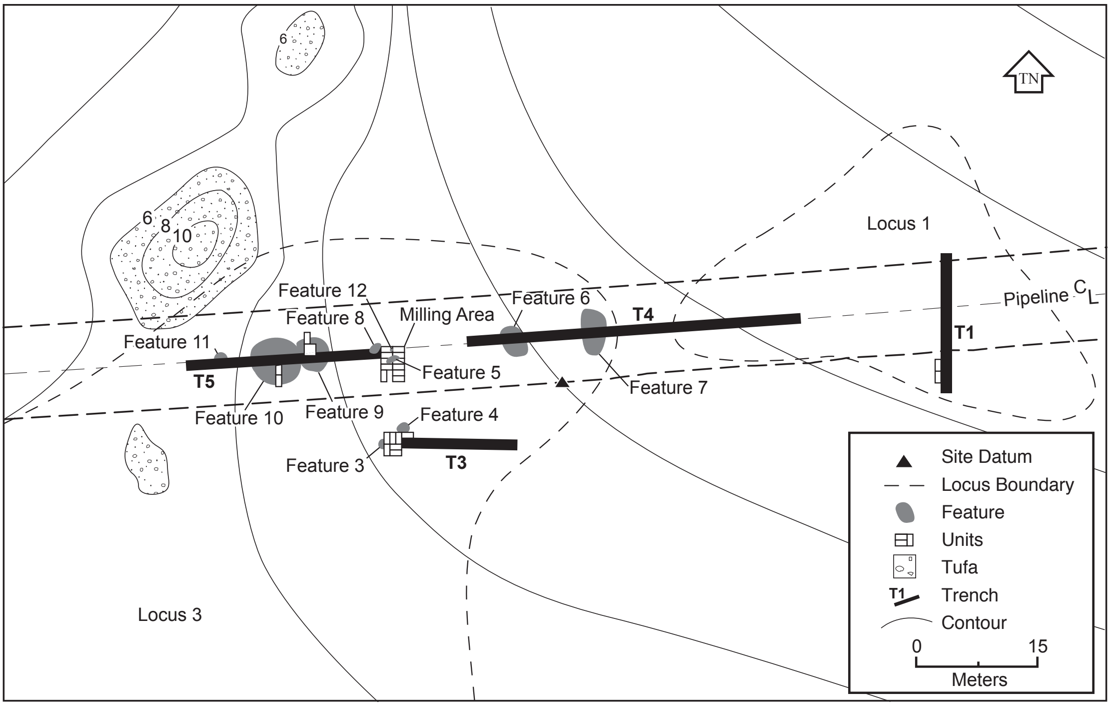

FIG. 6. Tufa Village (26WA2460) site map.

nine additional units. An additional house (Feature 4) was discovered during our work at Feature 3, so three more units were dug at this location. We also found two features within the Milling Area, a discrete group of ground stone tools and battered cobbles (Feature 5) and an ephemeral hearth (Feature 12).

Trench 4 was excavated in an east-west orientation down the construction centerline, traversing the western edge of Locus 1 and the eastern end of Locus 3 (see fig. 6). Two house floors were found in the sidewall profiles (features 6 and 7). Flotation samples were collected from both locations, but no formal excavations were attempted. Trench 5 continued down the centerline to the west of Trench 4. It encountered two small hearths (features 8 and 11), and two additional house floors (features 9 and 10). Flotation samples were collected from the two hearths, while the houses were sampled by four hand-excavated units.

Site Structure

We now provide descriptions of the multiple features discovered at the site (table 2), as well as the stratigraphic relationships encountered within the other, nonfeature portions of the deposit. The features and their associated artifacts and subsistence remains, as well as the nonfeature findings, will then be dated using radiocarbon assay, time-sensitive projectile points, and source-specific obsidian hydration readings, and placed within the chronological sequence established for the local area (table 3).

Locus 1: The Locus 1 profile exposed by Trench 1 and excavation units N1/E54 and N3/E54 begins with an upper A horizon of dark yellowish-brown (10YR 3/4) silty sand (fig. 7). Although a few artifacts exist in these upper sediments, the main cultural deposit is a buried midden (Stratum II) that extends about 9 m

TABLE 1
Excavation Summary from the Middle Archaic Component at 26WA2460
All feature depths are approximate because they were excavated stratigraphically and not in 10 cm levels.

Unit	Size (m)	Depth (cm)	Cubic Meters
LOCUS 1			
N1/E54	2 × 1	0–80	1.6
N3/E54	2 × 1	0–60	1.2
LOCUS 3			
Feature 3			
S10/W24.5	1 × 2	0–60	1.2
S11/W24.5	1 × 2	0–60	1.2
S11/W25.5	2 × 1	0–60	1.2
S9/W25.5	2 × 1	0–60	1.2
S9/W24.5	2 × 1	0–60	0.7[a]
Feature 4			
S9/W23.5	2 × 1	0–40	0.4[a]
S8/W22.5	1 × 2	0–40	0.8
Milling Area			
S2/W23	1 × 2	10–80	1.3[b]
S2/W25	2 × 1	10–40	0.6
N1/W25	1 × 2	10–40	0.6
N1/W23	1 × 2	20–40	0.4
S1/W23	1 × 2	20–40	0.4
N0/W25	1 × 2	10–40	0.6
N0/W23	1 × 2	20–40	0.4
N2/W25	2 × 2	20–40	0.8
N2/W23	2 × 2	20–40	0.8
Feature 9			
N3/W37	2 × 2	30–100	2.8
N5/W37	2 × 1	30–50	0.4
Feature 10			
S2/W41	2 × 1	0–70	1.4
N0/W41	2 × 1	30–90	1.2
Total	–	–	21.2

[a] Backhoe trench is subtracted from excavation volume.
[b] The 60 to 80 cm level was excavated as a 1 × 1 m unit.

TABLE 2
Features from the Middle Archaic Component at 26WA2460

Locus 3	Diameter (m)	Depth (cm)
Houses		
Feature 3	3.0	30–45
Feature 4	2.5	20–50
Feature 6	3.0	10–45
Feature 7	3.0[a]	20–50
Feature 9	2.5[a]	25–60
Feature 10	4.0	30–65
Hearths		
Feature 8	0.4	20–40
Feature 11	0.4	40–60
Milling Area		
Feature 5		
Artifact concentration	1.0 × 3.0	25–35
Feature 12		
Hearth	0.6 × 0.8	25–35

[a] Estimated size.

along the southern end of the trench. A sterile package of Lake Lahontan sands underlies the midden. A single median probability radiocarbon date of 3774 cal B.P. was obtained from a flotation sample collected from the Stratum II midden (table 4).

LOCUS 3 HOUSE FLOORS: **Feature 3.** After discovering the Feature 3 house floor in Trench 3, a 1 × 2 m unit (S10/W24.5) was placed over the feature on the south side of the trench (fig. 8). The unit was excavated in stratigraphic levels based on the profile exposed in the trench and included feature fill, the floor zone, and subfloor deposits. A second 1 × 2 m unit (S11/W24.5) was excavated to the south to enlarge the sample from the feature. Ultimately, three additional 1 × 2 m units were required to expose the entire house floor (S11/W25.5, S9/W24.5, and S9/W25.5).

The house has a maximum diameter of about 3 m, and is dish-shaped in profile (figs. 9, 10). The actual floor zone extends from about 30 to 45 cm below surface, and is composed of charcoal-darkened sediment that was probably created when the structure was burned. Due to the sandy nature of the local sediments, no hard-packed floor could be found during the excavations; postholes and foundation stones were also absent. A pocket of very dark sediment was found at the north end of the floor and could represent an informal hearth. A wide range of flaked, ground, battered, and bone tools was recovered from the house, as well as a robust sample of faunal remains. A flotation sample collected from the floor zone produced a radiocarbon date of 3490 cal B.P. (table 4).

Feature 4. Feature 4 was discovered in both the north and south walls of Trench 3 (figs. 8, 11), and appears to be about 2.5 m in diameter. Two 1 × 2 m units were used to sample the northern extent of the feature (S9/W23.5 and S8/

TABLE 3
Chronological Sequence for the Northwestern Great Basin with Concordance between Calibrated and Conventional Radiocarbon Ages

Time Period	Radiocarbon Years (B.P.)	Calibrated Date (cal B.P.)
Terminal Prehistoric	650–Contact	600–Contact
Late Archaic	1350–650	1300–600
Middle Archaic	3500–1350	3800–1300
Early Archaic	5000–3500	5700–3800
Post-Mazama	7000–5000	7800–5700
Paleoarchaic	10,900–7000	12,800–7800
Paleoindian	12,400–10,900	14,500–12,800
Clovis	11,500–10,900	13,400–12,800
Pre-Clovis	12,400–12,000	14,500–13,400

W22.5). Similar to Feature 3, it lacks a hard-packed floor, postholes, and foundation stones. Artifacts and faunal remains were present, but in much lower frequencies than at Feature 3. Because its north, south, and eastern margins were intact but its western edge appeared to have been truncated, we originally thought that it may have been disturbed by the construction of the Feature 3 house. A flotation sample collected from its floor zone, however, produced a radiocarbon date of 3050 cal B.P. (see table 4), indicating that Feature 4 slightly postdates the construction of Feature 3.

Feature 6. Feature 6 is an ephemeral house floor exposed in Trench 4 about 10 cm below the surface. The trench bisected the feature, leaving a 3.3 m section in the north wall and a 4.0 m section in the south wall (fig. 12). The feature is about 35 cm thick and composed of very dark grayish brown sediments, and covered by an upper zone of dark yellowish-brown loose silty sand. It lies on top of the yellowish-brown sterile sands found throughout the site. No artifacts were observed in the profile, and no hand excavations took place at this location.

Feature 7. Feature 7 is also an ephemeral house floor exposed in Trench 4 about 20 cm below the surface (fig. 13). The trench appears to have clipped its northern margins, as it is only exposed in the south wall of the exposure. It is roughly three m long and 30 cm thick, and composed of very dark grayish brown silty sand with charcoal mottling. The floor is covered by an upper zone of brown loose silty sand, and lies on top of the yellowish-brown sterile sand and a deeper very pale brown sand. No artifacts were observed in the profile, and no hand excavations were attempted at the feature.

Feature 9. Feature 9 is a house floor bisected by Trench 5 at a maximum depth of about 60 cm below surface (figs. 14, 15). It was excavated using the same stratigraphic methods applied to Features 3 and 4. It was sampled with a 2 × 2 m unit (N3/W37) and an additional 1 × 2 m exposure (N5/W37). Although the entire house was not exposed, these two units produced a robust assemblage of cultural material.

It is difficult to determine the full size of the floor due to the block excavation strategy applied to the feature, but it seems to be quite similar to others found at the site. The floor is dish shaped in profile, and extends from about 30 to 60 cm below surface. Part of a bighorn sheep skull was found on the floor (Feature 9/14); the skull fragment included both horns. A piece of the horn yielded a radiocarbon date of 2805 cal B.P. (see table 4).

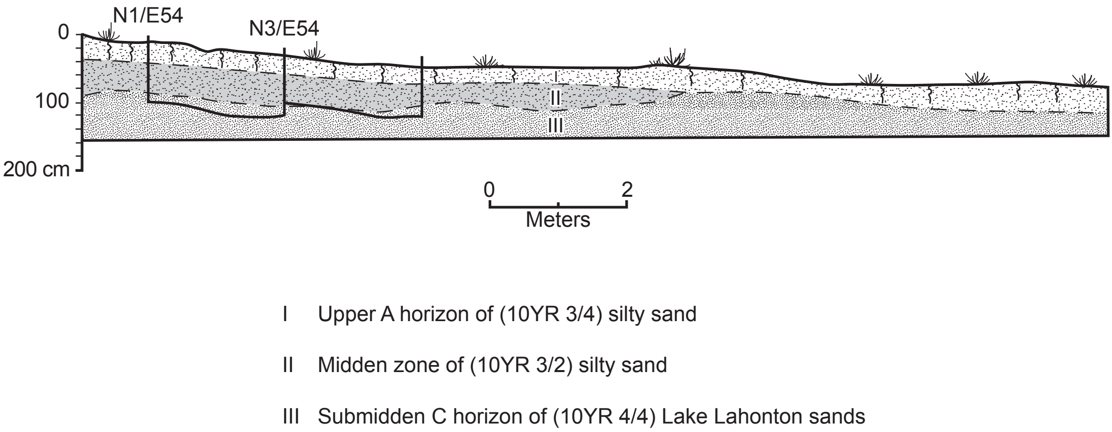

FIG. 7. West wall profile of Trench 1 and Units N1/E54 and N3/E54, Locus 1, 26WA2460.

A wide range of flaked, ground, battered, and bone tools was recovered from the house. Faunal remains were also quite plentiful within the feature.

Feature 10. Feature 10 was an intact house floor bisected by Trench 5, about 3 m to the west of Feature 9 (see fig. 14). It was excavated stratigraphically with two 1 × 2 m units (S2/W41 and N0/W41). The two north-south oriented units were excavated from Trench 5 to the southern lip of the house floor, resulting in a 1 m wide trench across the center of the house.

Trench 5 appears to have clipped the north edge of the house, indicating that it was probably about 4 m in diameter. The dish-shaped floor is about 15–20 cm thick and extends from 30 to 60 cm in depth (fig. 16). It has two hearths, one (Feature 10/13) composed of a concentration of charcoal, fire-affected rock, and artiodactyl bone surrounded by a few tufa cobbles, and the other (Feature 10/15) consisting of a simple concentration of charcoal (fig. 17). A radiocarbon sample obtained from the Feature 10/15 hearth yielded a date of 3685 cal B.P., while an additional sample from the Feature 10 floor produced a slightly later date of 3397 B.P., perhaps indicating that the location experienced episodes of reuse over time (see table 4). Similar to Feature 9, artifacts and faunal remains were abundant within this house feature.

LOCUS 3 HEARTHS: **Feature 8.** This feature is a small hearth exposed in the north wall of Trench 5 between 20 and 40 cm below the surface (fig. 18). It is a very dark brown concentration of charcoal-rich sediment, but it lacks hearth stones or associated artifacts. A radiocarbon sample collected from the feature produced a date of 858 cal B.P. (see table 4).

Feature 11. Feature 11 is a small hearth exposed in the south wall of Trench 5 between 40 and 60 cm below the surface (fig. 19). It is a black concentration of charcoal-rich sediment, but it lacks hearth stones or any other associated artifacts. No samples were collected from this location.

MILLING AREA: The scraped Milling Area was sampled with nine units, each excavated in unison (i.e., the first 10 cm level was completed in all units before the 20–30 cm level was excavated). The purpose of this strategy was to pedestal all the tools within this portion of the site so we could accurately document their relationship to one another. Nine units were used for this purpose, including seven 1 × 2 m exposures and two units measuring 2 × 2 m (fig. 20).

TABLE 4
Radiocarbon Dates from the Middle Archaic Component at 26WA2460

Provenience	Lab Number (Beta-)	Conventional Radiocarbon Age (B.P.)	Calibrated Results (cal B.P.)	
			2 Sigma	Median Probablity
Locus 1				
N1/E54	230707	3503 ± 40	3910–3700	3774
Locus 3				
Feature 3 floor	230702	3260 ± 40	3570–3390	3490
Feature 4 floor	230703	2910 ± 40	3210–2940	3050
Feature 9 horn on floor (Feature 9/14)	236439	2700 ± 40	2870–2750	2805
Feature 10/15 hearth	230705	3430 ± 40	3830–3580	3685
Feature 10 floor	230706	3170 ± 40	3460–3340	3397
Feature 8 hearth	230704	960 ± 40	940–780	858

This approach allowed us to identify and document a segregated pattern of ground and battered stone tools (fig. 21), including several in situ, stacked or cached handstone and millingstone pairs (fig. 22), and other artifact concentrations (fig. 23). The pattern of the milling gear and battered tools defines a processing space that is central to the house and hearth features that surround it. While several house floors also contained milling gear, the Milling Area retained a relatively dense concentration of ground and battered stone tools, all resting on a well-defined buried surface, and apparently cached for future use. The tools are typically made from basalt, cobble- to boulder-sized stones that are not part of the sedimentary texture or structure of the local landform. Breakage, where present, appears to be a byproduct of tool use, and many of the broken items seem to retain a high degree of utility. Feature 5, located near the center of the Milling Area, consists of several ground and battered stone tools within an elliptical area about 1 × 3 m. Feature 12 is an 80 × 60 cm concentration of charcoal and probably represents an informal hearth. Unfortunately, we did not collect a flotation sample from the hearth, so a radiocarbon date is not available from this feature.

Chronology and Component Definition

As outlined by table 4, all but one radiocarbon date fall within 3800 and 2800 cal B.P. Using the chronological sequence developed for the northwestern Great Basin by Hildebrandt et al. (2016; see table 3), occupations dating to this interval correspond to the early end of the Middle Archaic Period (3800–1300 cal B.P.). They are found in the buried midden at Locus 1 (3774 cal B.P.), and at all the dated house floors within Locus 3: Feature 3 (3490 cal B.P.), Feature 4 (3050 cal B.P.), Feature 9 (2805 cal B.P.), and Feature 10 (3685 and 3397 cal B.P.). A different period of site use is reflected by the small isolated hearth (Feature 8) found along Trench 5 (858 cal B.P.). This latter date corresponds to the Late Archaic Period, and probably reflects a more ephemeral use of the site.

We will now supplement these radiocarbon dates with other chronological indicators obtained from the site. We begin with time-sensitive projectile points, followed by obsidian hydration data.

Projectile points: Several diagnostic projectile points were recovered from the two primary loci at the site (tables 5, 6; fig. 24). Most of the collection is composed of dart-sized forms (*n*

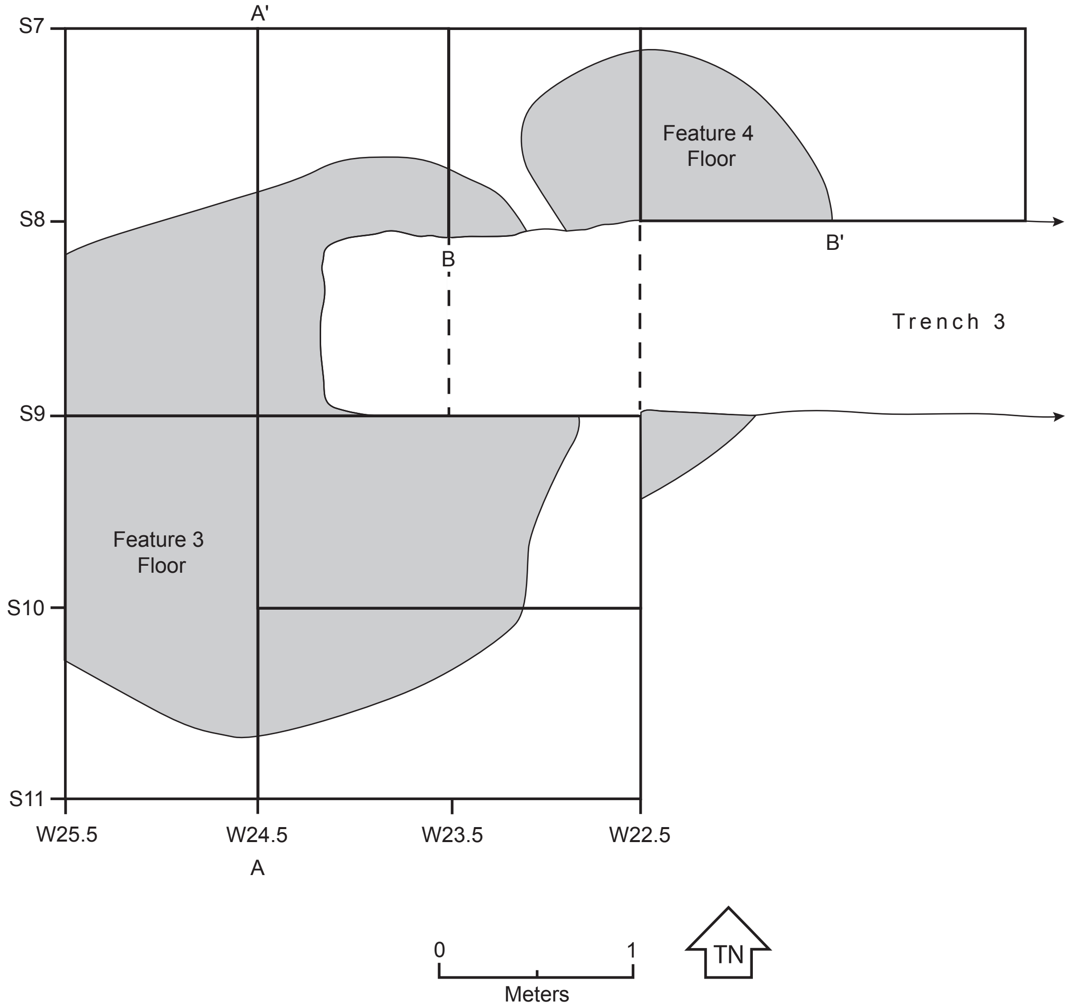

FIG. 8. Plan view of Feature 3 and Feature 4 house floors at 26WA2460.

= 22), but there are a few arrow-sized items as well (*n* = 3). The four house features at Locus 3 (features 3, 4, 9, and 10), which produced radiocarbon dates ranging from 3685 to 2805 cal B.P., produced 14 dart-sized point and only one arrow point, including seven Elko (46.7%), four Gatecliff (26.7%), two undifferentiated darts (13.3%), one Great Basin Stemmed (6.7%), and a single Rose Spring (6.7%) point.

The co-occurrence of Gatecliff and Elko points within the houses is noteworthy, as Gatecliff forms tend to correspond to the Early Archaic and are largely replaced by Elko in the Middle Archaic Period, especially after 3200 cal BP (Ames et al., 2010: 290). The data presented here indicate that this transition was not abrupt, with both point types co-occurring for a limited period of time. This finding is not unique to the current study, as they co-occur within Stratum 8 at Gatecliff Shelter between about 3530 and 3475 cal B.P. (Thomas, 1981: 13). This age range is quite similar to that exhibited by our houses, and consistent with the overlap found at a variety of other places as well (Bennyhoff and Hughes,

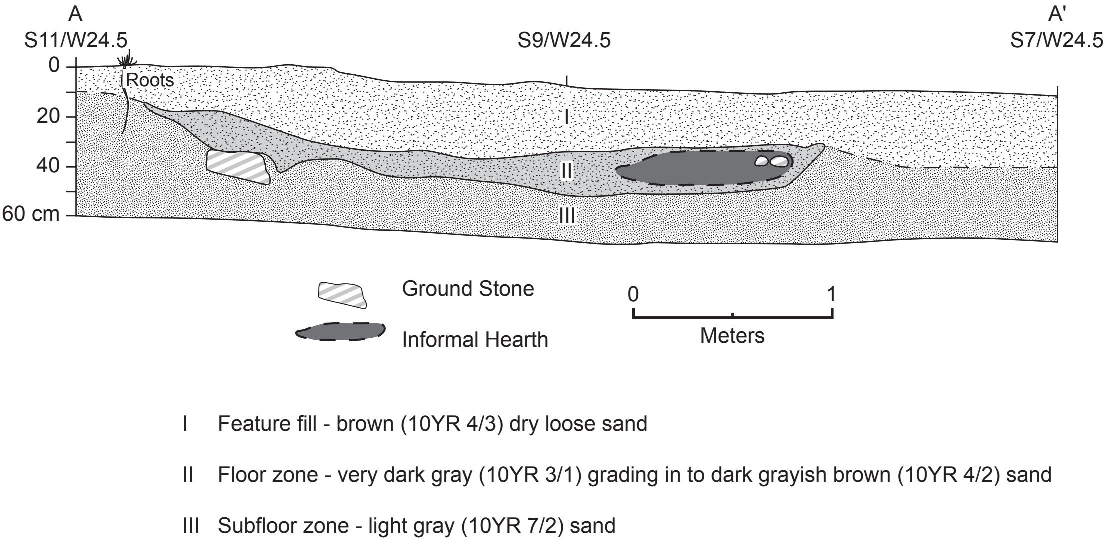

FIG. 9. West wall of Feature 3 house floor at 26WA2460.

1987: 163; O'Connell and Inoway, 1994; McGuire, 1997: 171–172).

The Milling Area, which lacks radiocarbon dates, is a little less compelling, as it yielded two Gatecliff (33.3%), one Humboldt (16.7%), one dart-sized (16.7%), and two Rose Spring points (33.3%). The relative early radiocarbon date from Locus 1 (3774 cal B.P.), however, matches up rather well with the projectile points from that portion of the site. The assemblage includes two leaf-shaped darts (50.0%), one Martis Contracting Stem (25.0%), and one Gatecliff point (25.0%), and none of the later dating Elko points.

Obsidian hydration data: Buffalo Hills (near Gerlach, Nevada) is the main source of obsidian found at the site, followed by lower frequencies of South Warners (Warner Mountains), and Bordwell Springs/Pinto Peak/Fox Mountain (BS/PP/FM; east of the Warner Mountains). Although multiple hydration-radiocarbon pairs do not exist for Buffalo Hills obsidian, data from time-sensitive projectile points indicate that it hydrates at a slower rate than the other obsidians in the assemblage (McGuire, 2002a). This relationship is at least partially confirmed by the data from 26WA2640 (table 7), as the mean hydration value for Elko points made from Buffalo Hills is 3.4 μm, while the mean from Elko points assigned to South Warners is 4.0 μm. Although the samples are much smaller for other point types, Buffalo Hills hydration readings for Gatecliff (mean of 3.6 μm) and Humboldt (3.9 μm) are largely consistent with the relative ages of these forms.

A single Rosegate point from South Warners produced a surprisingly thick reading of 4.0 μm. This is also the case for the other two Rosegate points made from BS/PP/FM obsidian, which had values of 5.4 and 4.3 μm, respectively (table 7).

Obsidian hydration data from the four houses, the Milling Area, and Locus 1 produced results that are consistent with the projectile points and associated radiocarbon dates (table 8). Buffalo Hills hydration means from the four houses range from 3.5 to 3.9 μm. These correspond quite well with the radiocarbon dates (2780–3830 cal B.P.) and with the projectile points, which are dominated by Gatecliff and Elko types. The Locus 1 mean of 3.9 μm corresponds to the larger rim readings from the

FIG. 10. West wall of Feature 3 house floor with two nearby millingstones. The northern lip of Feature 4 house floor can be seen in the foreground.

houses, and is associated with the oldest radiocarbon date of 3774 cal B.P.

As mentioned above, no radiocarbon dates were available from the Milling Area, so the dating of this area is largely reliant on obsidian hydration. Debitage samples collected from across the area (i.e., from three different excavation units) produced a tight cluster of Buffalo Hills readings with a mean value of 3.6 μm, which is essentially identical to the adjacent house structures. These findings indicate that all these features date to the same time period, and that Locus 1 may be slightly older, although the radiocarbon date does overlap at two sigma with the date of 3685 cal B.P. from the Feature 10 hearth (Feature 10/15).

Sample sizes from South Warners and BS/PP/FM obsidian sources are significantly smaller than Buffalo Hills, so not all of the above contexts can be evaluated with hydration data from these sources. Overall, the temporal consistency of the houses, Milling Area, and Locus 1 is maintained, as are the thicker readings from these faster-hydrating geochemical source groups.

Discussion: The vast majority of radiocarbon dates, projectile points, and obsidian hydration readings correspond to the earliest end of the Middle Archaic Period, ranging between about 3800 and 2800 cal B.P. As a result, all materials from Locus 1, the houses, and the Milling Area are assigned to this generalized temporal interval. We do, however, acknowledge that there are chronological differences among some of these areas, and all the data presentations below are segregated according to these spatial units so that their chronological integrity is maintained.

Artifact Inventory

A great deal of functional variability is exhibited across the site (table 9). At Locus 1, for example, flaked stone tools account for almost

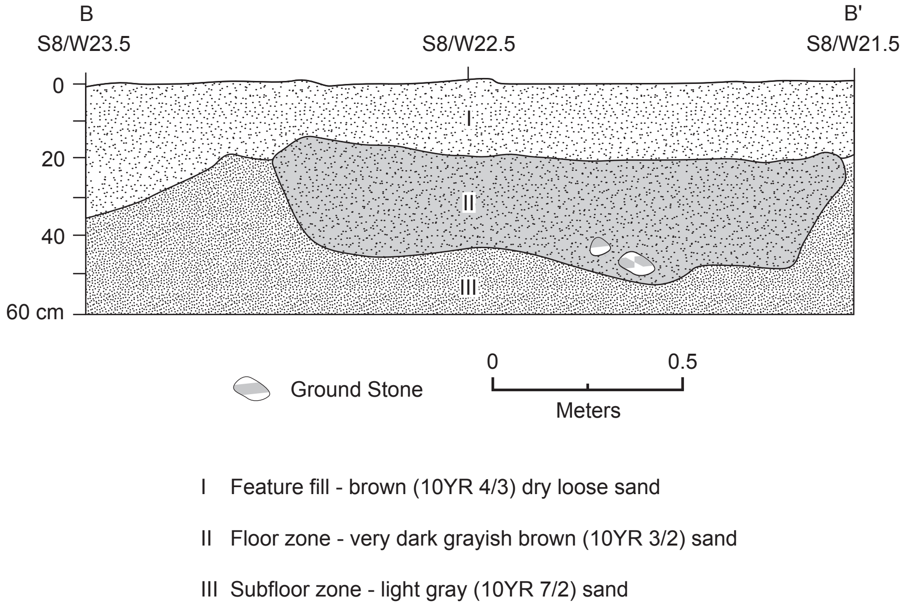

FIG. 11. North wall profile of Feature 4 house floor at 26WA2460.

70% of the assemblage while ground/battered stone makes up only 30%. A reciprocal relationship exists in the Milling Area, where ground/battered stone tools are dominant (63.6%), and flaked stone tools are found in much lower frequencies (36.4%). Artifact assemblages from the four house structures range between these two extremes. Features 9 and 10 look similar to Locus 1, except for the addition of several bone tools. A relatively even mix of flaked stone ground/battered stone, and bone tools were found at Feature 3, while Feature 4 produced a mix of tools almost identical to the Milling Area (fig. 25).

Flaked stone tools: Most of the flaked stone tools from the combined Middle Archaic component are composed of bifaces (40.5%), followed by flake tools (38.4%), and projectile points (17.3%). The relative percentage of flake tools (casual, multipurpose implements) versus bifaces and projectile points (more hunting-related tools) follow patterns that are largely consistent with the flaked stone to ground/battered stone dichotomy outlined in table 9. Locus 1 has a high frequency of bifaces and projectile points (71.8%) relative to flake tools (28.3%), while the opposite is the case in the Milling Area where bifaces and projectile points account for only 40.0% and flake tools increase to 60.0% of the assemblage. The Feature 9 house again produces a mix of tools similar to Locus 1, while a more even proportion of tools is found in the other houses; for example, bifaces/points are found in equal frequencies to flake tools at Feature 4 (fig. 26).

Bifaces. Bifaces are composed of relatively equal frequencies of obsidian (44.0%) and CCS (36.0%), with a lesser amount (20.0%) of items made from basalt (table 10). Most (76.0%) of the obsidian bifaces are Stage-5 fragments, while the remainder comprises an assortment from all other stages but the earliest, Stage-1 category. A lower, but significant number of Stage-5 bifaces are present in the CCS assemblage (38.1%), followed by equal frequencies of Stage-4 (19.0%) and Stage-3 (19.0%) forms, and slightly lower amounts of Stage-2 (9.5%) and Stage-1 (14.3%) specimens. The basalt assemblage, by contrast, is dominated by Stage-3 bifaces (78.6%), followed by a few Stage-5 (14.3%), and Stage-1 (7.1%) specimens. These data indicate that obsidian

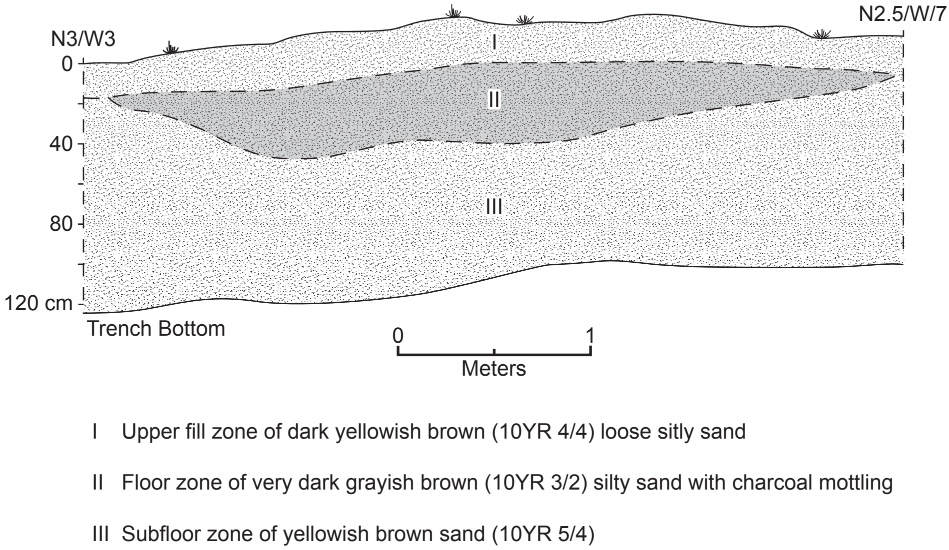

FIG. 12. South wall profile of Feature 6 exposed in Trench 4 at 26WA2460.

bifaces usually came to the site in near-finished condition, whereas the CCS and basalt tools arrived in more variable stages of completion, and were further reduced at the site.

The relative percentage of these material types also varies considerably across the three activity areas. Obsidian bifaces are quite prevalent in the houses (64.1%), while CCS specimens tend to be more abundant in Locus 1 (67.9%). The small sample of material from the Milling Area has equal numbers of obsidian and basalt specimens, but lacks CCS bifaces altogether. These distributions may indicate that flaked stone manufacturing occurred more frequently in Locus 1, and tool finishing and refurbishing was more common in the houses.

Simple and formed flake tools. Most of the combined assemblage of simple and formed flake tools are made of obsidian (51.5%), followed by lesser amounts of CCS (32.4%), and basalt (16.2%; table 11). When limiting the analysis to diagnostic flake types, all the basalt assemblage is made from cortical and interior flakes, while the obsidian collection is equally split between cortical/interior (50.0%) and biface-thinning flakes (50.0%). The CCS flake tools are farther down the reduction continuum, with biface-thinning flakes accounting for 75.0% and cortical/interior making up only 25.0% of the assemblage. Similar to the bifaces, CCS flake tools are dominant in Locus 1 (76.9%), while obsidian is more common in the houses (58.8%) and the Milling Area (57.1%), followed by lesser but significant frequencies of CCS and basalt.

A majority of the obsidian flake tools (54.0%) have straight edges on their primary and secondary working edges, and 70.6% of these have wear in the form of microchipping (table 12). The remaining obsidian flake tools have convex, concave, and a variety of other edge shapes (e.g., irregular, notched, sinuous), and microchipping accounts for only 41.4% of edge wear, as stepping/crushing and edge flaking account for almost all the remaining wear types. The frequency of straight edges is significantly lower among the CCS sample (33.3%), but the co-occurrence of microchipping remains quite high (76.9%). Convex edges are actually the most common form (35.9%), followed by small num-

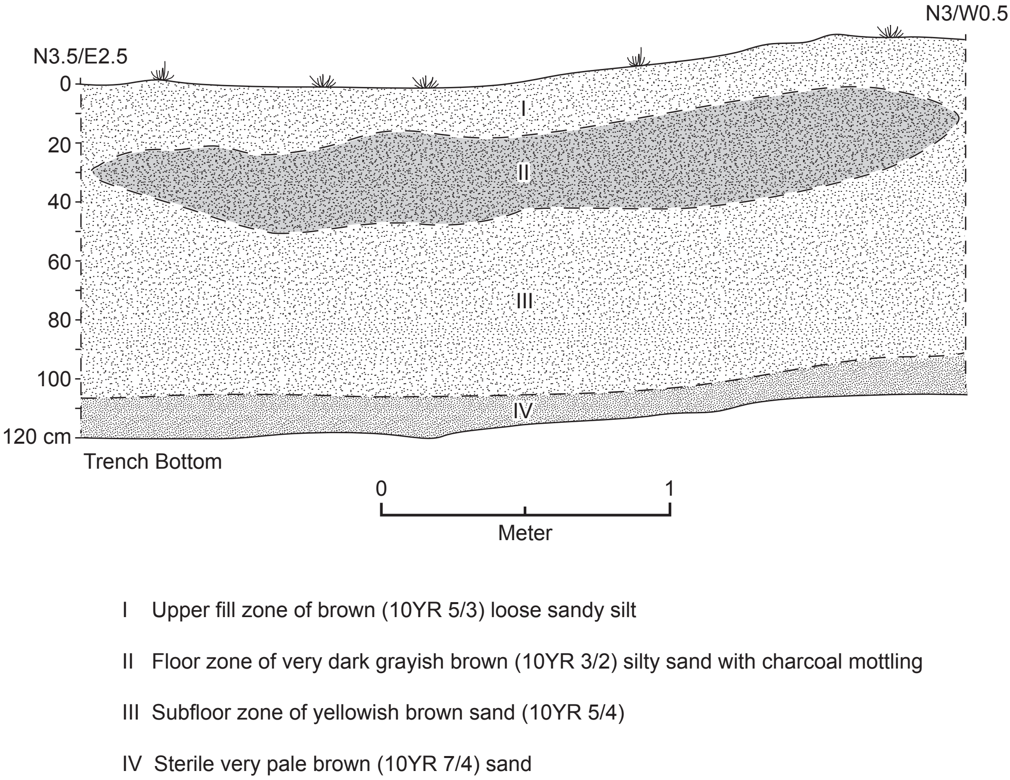

FIG. 13. South wall profile of Feature 7 exposed in Trench 4 at 26WA2460.

bers of several others. Although microchipping is less often found on these variable edge shapes than on the straight edged specimens, it does account for 57.7% of the sample.

Basalt flake tools have the lowest frequency of straight edges (28.6%), and only 50.0% of these have microchipping. These tools exhibit a wide range of edge shapes and show the highest diversity of wear—microchipping (42.9%), polish (21.4%), edge flaking (21.4%), and stepping/crushing (14.3%).

These general patterns probably indicate that obsidian tools were used for a narrow range of cutting tasks best accomplished with a straight, sharp edge. A wider range of tasks were accomplished with the CCS and basalt flake tools, including more heavy-duty work on a wider variety of materials.

Other flaked stone implements. Other flaked stone implements include two cores, two core tools, and three drills, all from Locus 1 and the Milling Area. The single core recovered from Locus 1 is a whole chunk of quartzite with multidirectional flaked removals. One of the two drills recovered from Locus 1 is a whole basalt specimen made from a biface-thinning flake. Its base has been created with bifacial flaking, and its bit is lenticular in cross section. The other drill is a whole CCS item made from an indeterminate blank. It also has bifacial flaking, and the bit is lenticular in cross section.

The remaining material comes from the Milling Area. The single core recovered from this portion of the site is a whole chunk of CCS with multidirectional flake removals. One of the core tools is a tabular basalt cobble with bifacial flake

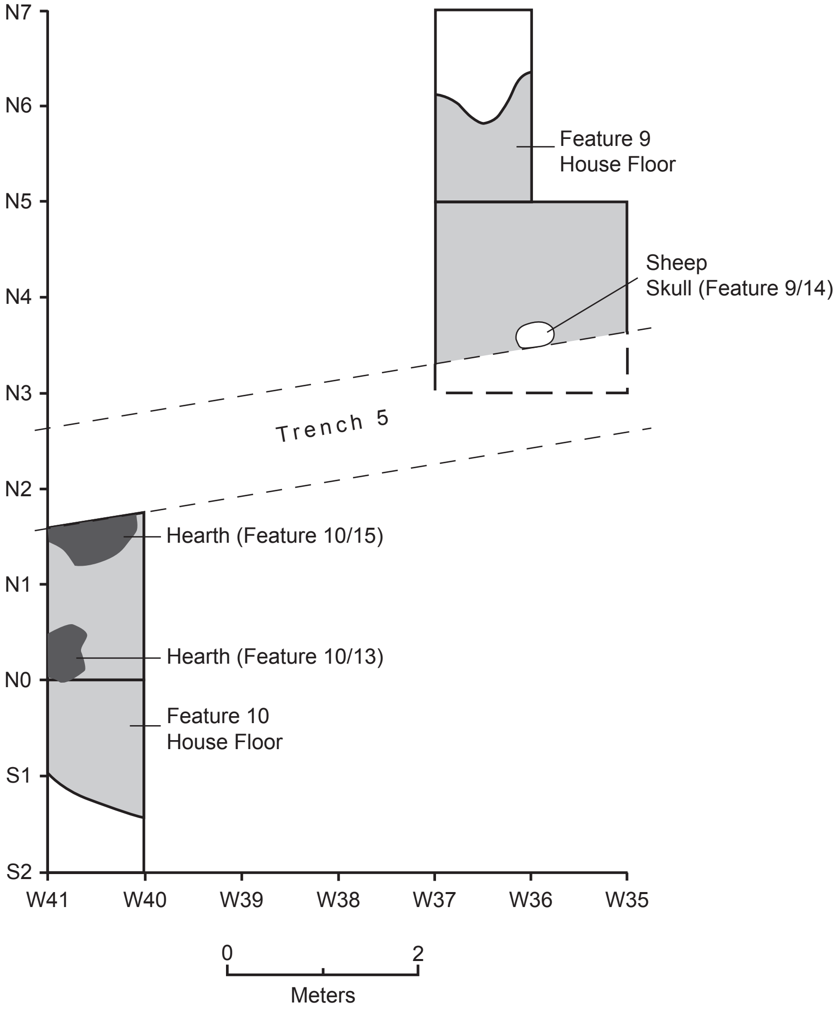

FIG. 14. Plan view of Feature 9 and Feature 10 house floors at 26WA2460.

removals and battering along its working edge, while the other is a globular basalt cobble with multidirectional flaking and wear in the form of edge grinding and polish. The Milling Area drill is made from a basalt biface-thinning flake, has a bifacially modified base, and a bit with a lenticular cross section.

Debitage. Technological analysis of debitage focused on Locus 1, two of the house features (Features 3 and 9), and the Milling Area. The relative proportion of material types varies across these four locations (table 13). Debitage from Locus 1 is dominated by CCS (77.9%), followed by lesser amounts of obsidian (12.4%) and basalt (9.7%). Obsidian replaces CCS as the dominant material in Feature 9 (65.7%) and to a lesser extent at Feature 3 (47.8%), while basalt (21.3 and 35.6%, respectively) is somewhat more abundant than CCS (13.0 and 16.6%, respectively) in both of these locations. The most even mix of material is found in the Milling Area, with obsidian

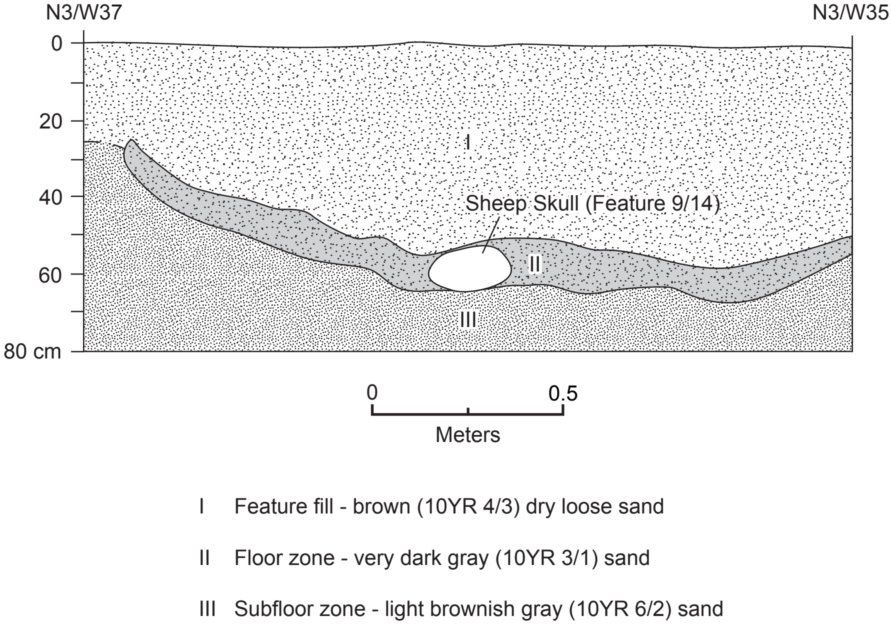

FIG. 15. North wall profile of Feature 9 house floor at 26WA2460.

remaining abundant (47.1%), followed by basalt (30.6%), and CCS (22.3%).

Due to the abundance of debitage at the site, a subsample of each material type was selected for analysis. All obsidian and basalt debitage from both excavation units within Locus 1 was analyzed, while the CCS sample was limited to Unit N1/E54 between 10 and 60 cm below surface. All debitage from the floor zone of Features 3 and 9 make up the house sample, while the Milling Area includes obsidian and basalt from units N2/W25 and N2/W23, and CCS from N2/W25, N2/W23, N1/W25, and N1/W23.

The technological profiles for obsidian and CCS debitage are almost identical to one another and stay consistent across the site (table 14; fig. 27). Both assemblages are dominated by pressure flakes (roughly 80%), and have low and nearly equal frequencies of late biface-thinning, early biface-thinning, and core-reduction debris. Basalt is only slightly different, with a lower frequency of pressure flakes (roughly 60%), and near-equal frequencies of the other technological classes. These data indicate that much of the material arrived as bifacial blanks that were later modified into finished tools. This conclusion is fully consistent with the ratio of projectile points/bifaces ($n = 107$) to cores ($n = 2$), and the relative abundance of thinned bifaces ($n = 53$) versus the earlier Stage-1 and Stage-2 forms ($n = 7$) from the same parts of the site (see table 10).

Ground and battered stone tools: The diagnostic ground and battered stone tool assemblage includes handstones (55.2%), millingstones (31.9%), and battered cobbles (12.9%). This mix of implements stays roughly the same within the houses and Milling Area, but differs in Locus 1 where millingstones are more abundant (57.9%) than handstones (15.8%) and battered cobbles (21.1%).

Many of the millingstone attributes vary significantly across the three Middle Archaic activity areas at the site (see table 15). Most of the millingstones from the houses are made from

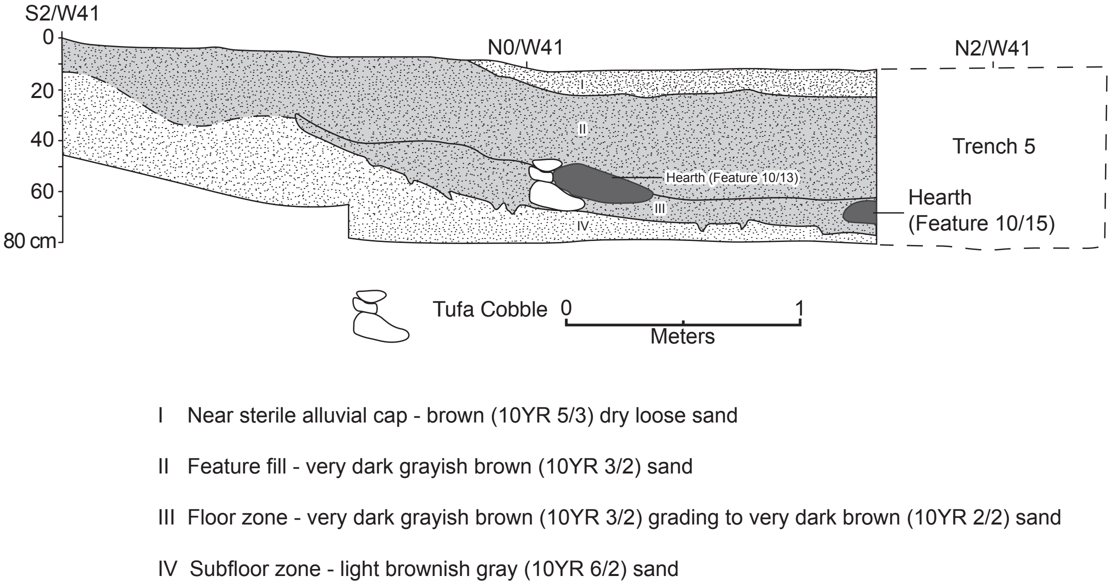

FIG. 16. West wall profile of Feature 10 house floor at 26WA2460.

basalt (71.4%), tend to be thick slabs or blocks (75.0%) with dished or basin wear (100.0%), and have a relativity high frequency of bifacial wear (33.3%). There is also a relatively high occurrence of complete items (28.6%), and they are consequently quite heavy, averaging 3050 grams. The Milling Area assemblage also has numerous basalt millingslabs (68.4%), a high frequency of thick slabs (85.7%), and relatively large specimen sizes (1277 grams), but has a lower occurrence of dished-out wear surfaces (60.0%), bifacial wear (16.7%), and complete specimens (17.6%). Greater contrast is evident in Locus 1, where basalt accounts for only 45.5% of the assemblage (granite and other materials make up the remainder), thick slabs and blocks are rare (14.3%) compared to thin slabs (85.7%), and complete tools are also comparatively rare (9.1%), resulting in an average weight of only 174.1 grams. Bifacial wear (20.0%) falls between that of the houses and the Milling Area, as does the frequency of dished-out wear surfaces (71.4%; table 15).

Almost all the handstones come from the Milling Area and the houses (table 16). Basalt is the dominant material type at both places (92.1% and 95.5%, respectively). Both areas have relatively equal frequencies of complete specimens (26.3% and 27.3%), but they differ from one another with regard to the degree of wear. The house assemblage appears to be more intensively used, as 80.0% of the handstones have bifacial wear, and the primary wear surface shows smooth polish 81.2% of the time. Only 38.7% of the Milling Area assemblage has bifacial wear, and the primary wear surfaces on these artifacts show smooth polish on only 48.6% of the specimens.

The vast majority of the battered cobbles are made from basalt (85.7%). Most of these objects show multiple kinds of heavy-duty wear, including battering, grinding, spalling/step fracturing, and flaking (table 17). Locus 1 includes all these wear types except for grinding, while the amount of grinding increases when moving in to the houses (20.0%) and reaches a maximum fre-

FIG. 17. Close-up photograph of hearths (Features 10/13 and 10/15) within house floor Feature 10.

quency in the Milling Area (33.3%). These patterns may indicate that the Locus 1 assemblage was used more for flaked stone reduction and a variety of other tasks, while these tools had expanded plant processing uses in the houses and the Milling Area.

Bone tools: Sixty-five pieces of modified bone were recovered from the Middle Archaic component (table 18). The assemblage includes utilitarian implements (needles, awls, gouges) and items falling into the more artistic realm of culture (tube beads and incised pieces).

The three utilitarian artifact types are distinguished from one another based on their size and morphology. Needles are very thin (<5 mm in diameter) and delicate from tip to base. Awls are sharply pointed at the tip, but usually widen out to greater than 10 mm in diameter and show extensive areas of unpolished splinter facets or remnant long bone trough at the proximal end. Gouges have blunt, robust tips and are variously shaped along the body. Tube beads are made from the long bones of leporids or birds, and are typically cut, snapped, and end-ground. Bead blanks, or blank fragments, often have been cut and snapped but show no grinding.

The majority of the assemblage is composed of indeterminate pieces of polished and sometimes fire-hardened bone, most of which are probably small awl fragments. Awls dominate the utilitarian assemblage (80.0%), while needles and gouges are found in limited numbers. The non-utilitarian assemblage is composed of tube beads and fragments, and one piece of incised bone. Locus 1 has only awls, needles, and gouges, while the houses and Milling Area have a mixture of these utilitarian items, the tube beads, and the single incised bone.

Baked clay: Thirty-eight pieces of baked clay were recovered from the Middle Archaic

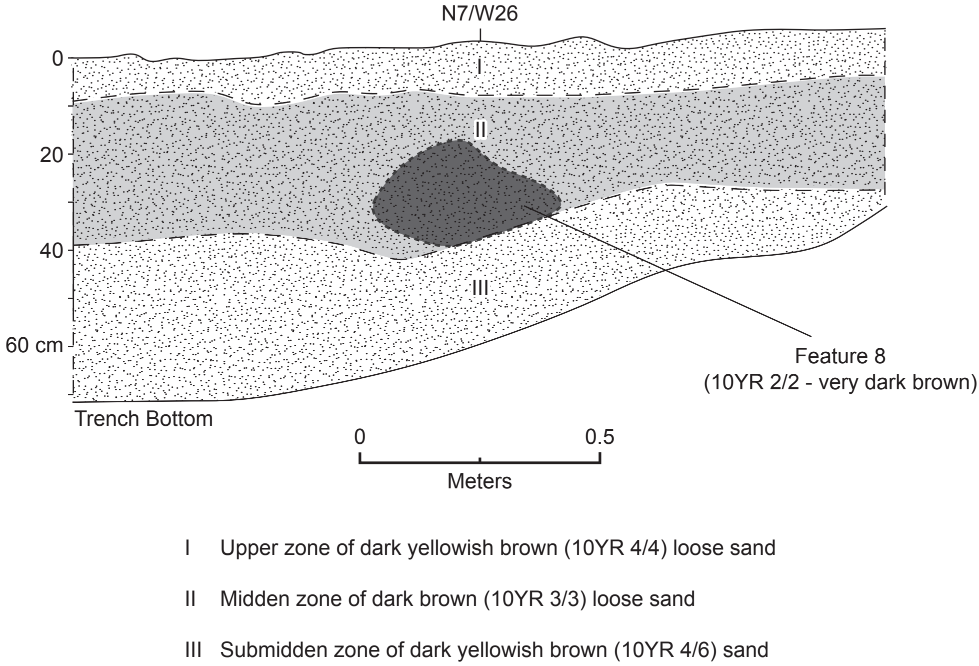

FIG. 18. North wall profile of Feature 8 exposed in Trench 5 at 26WA2460.

Component. All but one was found within the houses, with most (*n* = 31; 85.1%) from Feature 10. Given the sandy nature of the local sediment, they appear to have been purposefully brought to the site. The pieces are quite small, but some have faint impressions on them (fig. 28). The impressions vary to include single linear grooves, light parallel lines, and a pattern that may reflect coiled basketry. None of these impressions are definitive, and their function remains unknown.

Floral and Faunal Remains

Faunal remains are abundant at the site and vary significantly across the deposit. Unfortunately, floral remains are much less abundant, and have more limited interpretive value.

Charred plant remains: Charred seed densities were surprisingly low at the site (table 19). They occurred sporadically in the Middle Archaic component, with the exception of two flotation samples from the floor zone of the Feature 10 house. Both of the samples were from subfeatures on the floor, a charcoal stain (Feature 10/15), and a concentration of fire-affected rock (Feature 10/13). The combined findings from the Middle Archaic component are dominated by cattail (69.6%), followed by lower frequencies of saltbush (10.9%), rush (6.5%), antelope bush (5.4%), and trace amounts of goosefoot, hairgrass, blazing star, and seepweed. This mix of taxa represents a significant use of wetland taxa (cattail, rush, hair grass, seepweed), as well as dry land plants (saltbush, antelope bush, goosefoot, and blazing star). The seeds from these plants become available during the summer in both habitats.

Faunal remains: Due to the abundance of faunal remains recovered from the site, our analysis focused on Locus 1, house Features 3 and 9, and the Milling Area. Excluding reptiles and

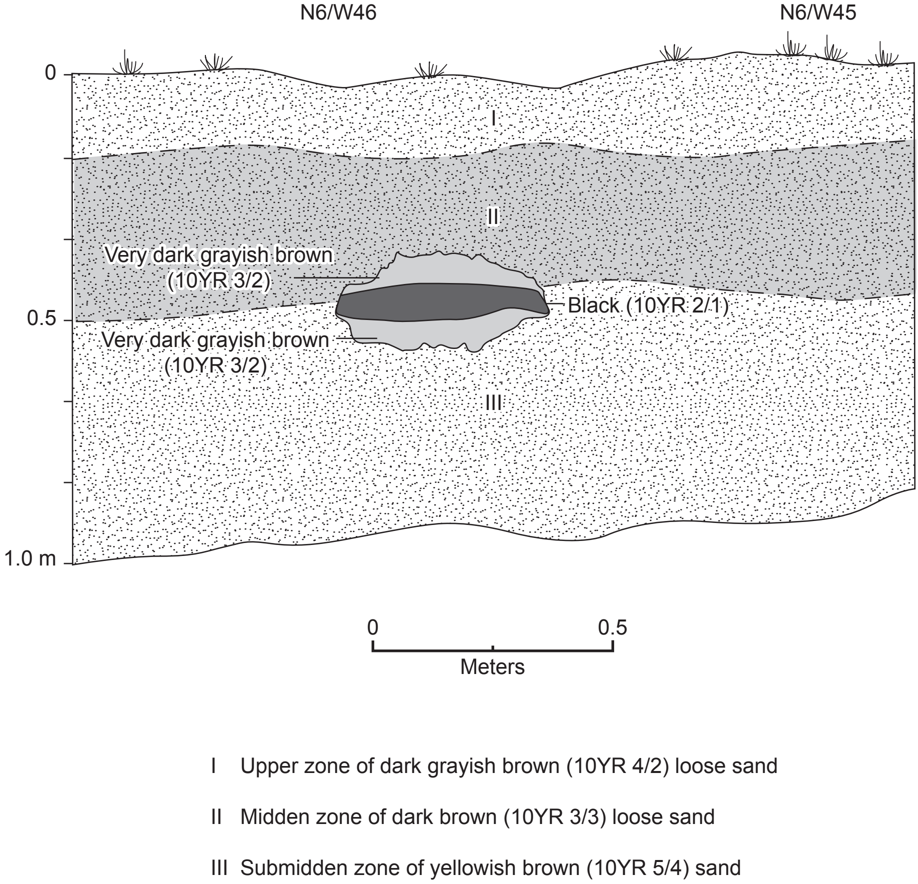

FIG. 19. South wall profile of Feature 11 exposed in Trench 5 at 26WA2460.

rodents, the faunal assemblage is dominated by leporids and artiodactyls (94.4%), followed by lesser amounts of fish (5.5%), birds (4.1%), and carnivores (0.4%; table 20). Reptiles and rodents/insectivores were also recovered, but due to their propensity to die in underground burrows, it is difficult to distinguish natural deposition from culture remains. As a result, they are excluded from the analysis. Their absence will undervalue the importance of small mammals to some degree, but the abundance of leporids provides us with plenty of evidence of how small game figured in the subsistence pursuits of the people living at the site.

Most of the bone at the site is highly fragmentary, often making species identifications very difficult. Nevertheless, the more general levels of identification produce several intriguing patterns. The relative frequency of artiodactyls versus leporids, for example, shows significant variation across the site. Artiodactyls make up 26.2% versus 73.8% leporids within the overall assemblage, reaching a high of 46.0% in Locus 1. When moving into the house features, artiodactyls remain relatively high in Feature 9 (36.7%), drop to a low of only 5.6% in Feature 3, but increase again in the Milling Area (20.2%). Of those bones that could be identified to the species level, mountain sheep

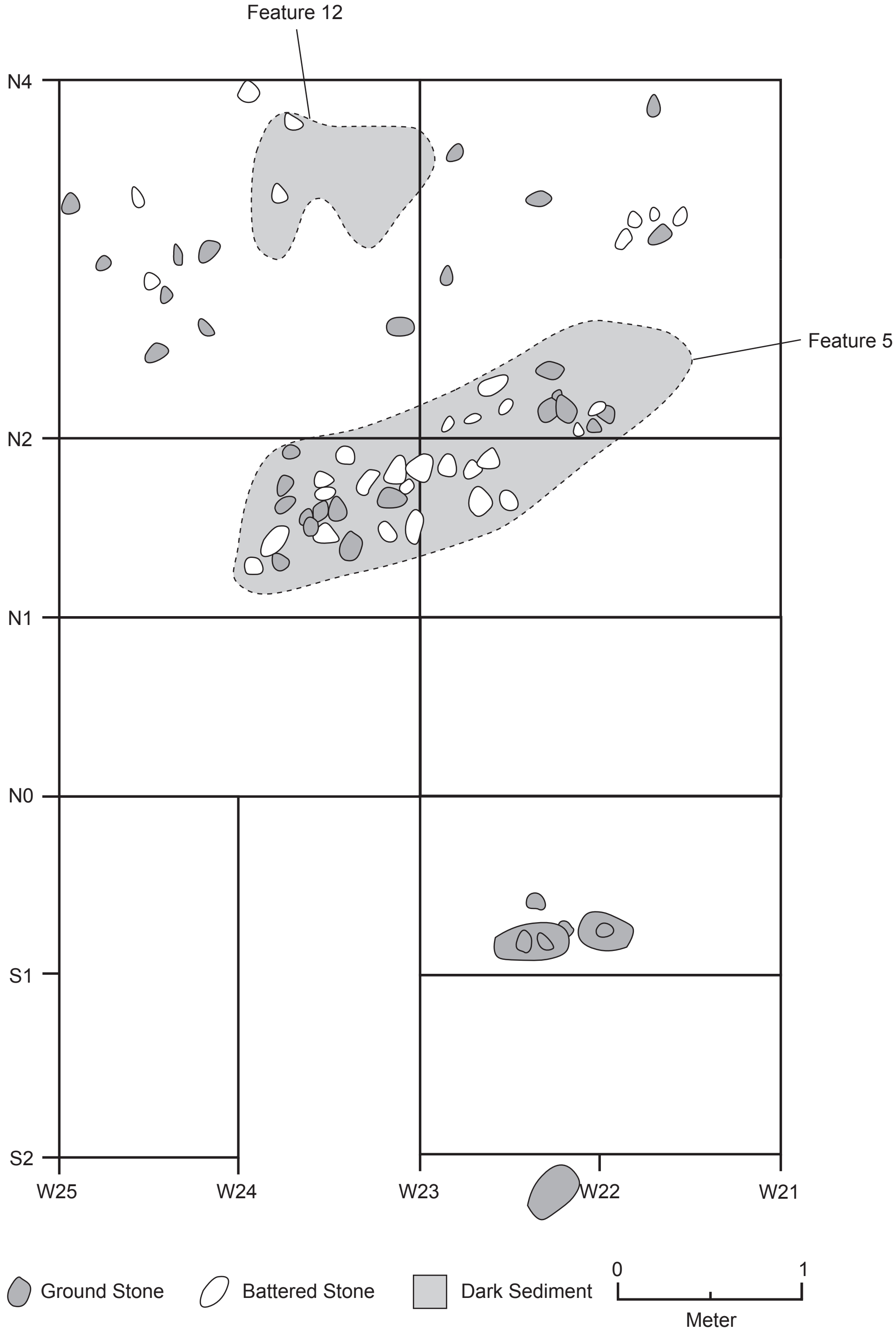

FIG. 20. Plan view of Feature 5 and Feature 12 within the Milling Area excavation zone at 26WA2460.

FIG. 21. Pedestaled ground and battered stone tools in the Milling Area of the site.

(63.2%) are more abundant than deer (36.8%), but this also changes when moving across the site. Beginning in Locus 1, deer represent 100.0% of the assemblage, whereas mountain sheep dominate the two houses and the Milling Area (78.3%).

Jackrabbits (46.0%) and cottontails (53.0%) were found in near equal proportions at the site as a whole, but the mix of these species varies with activity area. Most of these leporid remains were found in the two houses, with Feature 9 showing a more dominant presence of jackrabbit (65.2%) relative to cottontails (34.8%), while the opposite is the case at Feature 3, where cottontails (75.0%) outnumber jackrabbits (25%). This contrast in the proportion of leporid species not only reflects differential hunting techniques, as jackrabbits are best taken in communal drives and cottontails on a more individual basis, but also underlines the high degree of interhouse variability exhibited at the site.

Carnivores are limited to three dog/coyote bones from the Feature 9 house, while most of the birds are found in Locus 1, with limited numbers also found in Feature 9 and the Milling Area. Although most of the bird bone was highly fragmented with few diagnostic attributes, the two identifiable fragments are both duck, reflecting use of the nearby wetland habitats of the Honey Lake Basin.

Fish are found in all four of the sampled contexts, with most coming from the Feature 3 house. They include cutthroat trout/trout, minnows/suckers, and Tui chub. These three taxonomic groups reflect a significant range of microenvironments, including cool, clear stream or lake habitats (trout), slow brackish waters (Tui chub), and intermediate or slow water areas (minnows/suckers). It seems likely that the Tui chub could have extended down into the delta of Long Valley Creek 15 km to the west, and per-

FIG. 22. Close-up photograph of a millingstone and associated handstones found within the Milling Area of the site.

haps into Honey Lake less than 25 km northwest, and even closer if waters were higher during occupation of the site. The minnows/suckers would have been captured in the deltas and slightly upstream, while the trout must have been farther away from the lake basin where the water quality was improved.

Fragmentary, unidentifiable bone makes up almost 90% of the assemblage, averaging only 0.1 grams per specimen. When categorized by estimated animal size rather than taxonomic group, however, it follows the above patterns rather closely (table 21). When comparing deer-sized to rabbit-sized bone fragments, the deer-sized specimens make up 28.8% of the overall Middle Archaic assemblage, with the highest percentage coming from Locus 1 (49.0%). These frequencies progressively drop when moving to Feature 9 (21.1%) and Feature 3 (18.7%), but increase again in the Milling Area (28.8%).

Body part frequencies among the artiodactyls show significant frequencies of cranial and teeth fragments (especially teeth), followed by long bone fragments (mostly femurs, humeri, and tibias), metapodials, and foot bones (table 22). Vertebrae and ribs are represented by a single specimen, and parts of the pelvis and scapula are completely missing. These relationships change among the medium-to-large mammal bone, as undifferentiated long bone fragments are dominant, followed by cranial fragments and very little else. The high frequency of long bone fragments probably reflects heavy processing for marrow, while the near absence of the vertebrae/

FIG. 23. Close-up photograph of a concentration of ground and battered stone tools found within the Milling Area at the site.

rib and scapula/pelvis groups can probably be attributed to their low mineral densities, as it is not uncommon to see these elements underrepresented in other zooarchaeological assemblages (see Lyman 1994: 246–249).

Leporid body parts also have high frequencies of cranial and teeth fragments, but more even contributions of long bones and foot bones, lesser numbers of metapodials and scapula/ribs, and no vertebrae/ribs (table 23). Vertebrae/ribs, however, show up among the small-to-medium mammal where they outnumber all other body parts except long bones, with the latter surpassing 3200 specimens. Like the larger animals, this finding demonstrates that leporid long bones were intensively processed for marrow within all portions of the site.

SUMMARY

Tufa Village was primarily occupied between about 3800 and 2800 cal B.P. Three main activity areas were identified during this phase of occupation, including Locus 1, a series of houses (Locus 3), and a Milling Area. Locus 1 appears to be slightly older than the other two areas, dating to around 3775 cal B.P. It was dominated by flaked stone tools and debitage, but also had a moderate-sized assemblage of ground and battered stone implements, and a few bone tools. The faunal assemblage included roughly equal amounts of artiodactyl and leporid bones, and much lower frequencies of bird and fish. Although much of the mammal bone was highly fragmented, the identifiable artiodactyl

TABLE 5

Spatial Distribution of Projectile Points from the Middle Archaic Component at 26WA2460

	Locus 1	Locus 3					Total
		Feature 3/4	Feature 10	Feature 9	Milling Area	Subtotal	
Great Basin Stemmed	–	–	1	–	–	1	1
Martis Contracting Stem	1	–	–	–	–	–	1
Leaf-Shaped	2	–	–	–	–	–	2
Humboldt	–	–	–	–	1	1	1
Gatecliff	1	1	2	1	2	6	7
Elko	–	–	3	4	–	7	7
Dart-Sized	–	–	2	–	1	3	3
Rose Spring	–	–	–	1	2	3	3
Indeterminate	1	2	1	3	–	6	7
Total	5	3	9	9	6	27	32
Radiocarbon calibrated	3774	3490	3397	2805	–	–	–
Median probability (cal B.P.)	–	3050	3685	–	–	–	–

TABLE 6

Metric Data for the Diagnostic Projectile Points from the Middle Archaic Component at 26WA2640

COLUMN HEADINGS: CND = condition; MTL = material; ML = maximum length; AL = axial length; MW = maximum width; MTH = maximum thickness; WT = teight (in grams); BW = basal width; NW = neck width; PSA = proximal shoulder angle (degrees); DSA = distal shoulder angle (degrees); NOA = notch opening angle (degrees); MxWP = maximum width position (percentage); STL = stem length.
WHL = whole; PRX = proximal; NCO = nearly complete; BAS = basalt; CCS = cryptocrystalline silicate; OBS = obsidian; DAC = dacite; 888 = not applicable; 999 = indeterminate.

Catalog	Locus	Provenience	Feature	Type	CND	MTL	ML	AL	MW	MTH	WT	BW	NW	PSA	DSA	NOA	MxWP	STL
17	1	Surface Artifact	–	Gatecliff	WHL	BAS	34.8	32.7	19.2	7.5	4.3	14.7	13.7	108	207	99	888	9.0
18	1	Surface Artifact	–	Leaf Shaped	WHL	CCS	37.4	37.4	15.6	7.3	4.0	10.3	888	888	888	888	37	888
50	1	Unit N1/E54	–	Leaf Shaped	WHL	CCS	37.7	37.7	18.4	6.8	4.5	7.9	888	888	888	888	43	888
60	1	Unit N1/E54	–	Martis Contracting Stem	WHL	BAS	-48.0	-45.7	15.9	5.3	-4.4	-9.0	-10.5	999	200	999	888	-8.8
173	3	Unit S2/W23	Milling Area	Humboldt	PRX	OBS	-9.4	-9.4	-13.9	2.7	-0.3	10.2	5.7	151	160	9	888	7.3
231	3	Unit N1/W25	Milling Area	Gatecliff	PRX	DAC	-12.1	-8.8	-12.7	4.4	-0.6	12.7	10.9	108	999	999	888	-12.1
301	3	Unit N2/W25	Milling Area	Gatecliff	WHL	OBS	29.8	27.3	-18.2	4.1	1.5	8.6	8.5	100	159	59	888	6.1
317	3	Unit N2/W23	Milling Area	Humboldt	WHL	OBS	31.3	29.5	17.6	4.4	2.3	14.9	999	999	999	999	888	999
325	3	Unit N2/W23	Milling Area	Rose Spring	PRX	OBS	-6.6	-6.6	-8.7	3.4	-6.6	-7.4	888	888	888	888	888	6.6
419	3	Unit S10/W24.5	3	Gatecliff	WHL	BAS	49.9	47.1	25.5	6.2	4.8	11.0	11.9	92	134	42	888	7.6
529	3	Unit N0/W41	10	Gatecliff	WHL	BAS	51.1	48.7	19.5	4.8	3.3	9.5	9.2	85	126	41	888	7.4
638	3	Unit S2/W41	10	Elko	WHL	OBS	29.1	28.8	24.9	4.4	1.7	12.3	9.1	113	120	7	888	7.1
639	3	Unit S2/W41	10	Gatecliff	PRX	OBS	-11.1	-7.3	-13.6	3.3	-0.4	13.6	8.7	112	999	999	888	8.2
640	3	Unit S2/W41	10	Elko	NCO	OBS	25.1	24.4	-18.6	3.8	-1.0	10.3	6.8	120	135	15	888	6.9
658	3	Unit S2/W41	10	Elko	WHL	OBS	28.7	28.7	-18.5	3.5	-1.4	11.7	8.3	145	140	-5	888	6.0
659	3	Unit S2/W41	10	Western Stemmed	NCO	BAS	-58.0	-56.4	-29.4	-7.3	-11.8	17.8	17.9	91	178	87	888	14.0
696	3	Unit N3/W37	9	Elko	PRX	BAS	-19.6	-18.0	-20.1	3.6	-1.2	10.4	7.7	114	148	34	888	6.3
697	3	Unit N3/W37	9	Elko	NCO	OBS	37.6	37.6	-19.8	3.8	-1.7	-10.4	9.5	116	999	999	888	7.8
699	3	Unit N3/W37	9	Gatecliff	WHL	CCS	46.2	44.5	18.4	6.2	2.3	8.7	7.1	112	149	37	888	5.9
701	3	Unit N3/W37	9	Rose Spring	PRX	OBS	-11.3	-10.2	13.4	3.3	-0.4	8.2	6.0	119	154	35	888	5.7
702	3	Unit N3/W37	9	Elko	PRX	OBS	-7.9	-6.4	-13.9	2.8	-0.3	13.9	-9.8	113	999	999	888	-7.9
744	3	Unit N3/W37	9	Elko	PRX	OBS	-26.8	-22.7	-13.8	-4.6	-1.5	13.8	8.3	122	999	999	888	7.1

FIG. 24. Projectile points (above and on opposite page).


-638
Elko
-640
Elko
-658
Elko
-696
Elko
-697
Elko
-702
Elko
-744
Elko
-173
Rose Spring
-325
Rose Spring
-701
Rose Spring
0
5 cm

TABLE 7
Source-specific Obsidian Hydration Data (in microns) on Projectile Points from the Middle Archaic Component at 26WA2460
BS/PP/FM = Bordwell Springs/Pinto Peak/Fox Mountain obsidian source group.

Artifact Number	Buffalo Hills	South Warners	BS/PP/ FM
Humboldt			
-317	3.9	–	–
Gatecliff			
-639	4.0	–	–
-301	3.3/4.2	–	–
Elko			
-638	3.5	–	–
-702	3.2	–	–
-744	3.5	–	–
-640	–	4.0	–
-658	–	4.0	–
-697	–	4.0/5.0	–
Dart-sized			
-528	3.4	–	–
Rose Spring			
-325	–	4.0	–
-173	–	–	5.4
-701	–	–	4.3

sample was represented by deer, while the leporids were exclusively cottontail rabbit. Plant macrofossils from Locus 1 were limited to a single cattail seed.

Six buried house structures were discovered within Locus 3, many of which included small hearths and discrete concentrations of artifacts and faunal remains. Although there is minimal overlap among their radiocarbon dates (they range from 3685 to 2805 cal B.P.), more houses probably lie buried within the locus, given the rather thin, linear sampling strategy we used to mitigate impacts associated with pipeline construction. It seems likely, therefore, that a higher degree of contemporaneity among the multiple dwellings would emerge with a larger sample.

One of the houses (Feature 9) had a sheep cranium (with horns) placed on the floor. This finding could represent a headdress used in dance ceremonies, or a decoy used during the hunt itself. The house structures produced a more even mix of flaked stone, ground/battered stone, and bone implements than was found in Locus 1. They also contained all but one of the baked clay items. Although some of these artifacts have impressions that look something like matting or basketry, all are quite faint and could not be definitively identified.

The faunal assemblage had slightly higher frequencies of leporids versus artiodactyls than was the case in Locus 1. Also in contrast to Locus 1, mountain sheep were much more

TABLE 8
Source-specific Hydration Data from 26WA2460
Column Headings: No. = number; SD = standard deviation; CV = coefficient of variation.
Ages: Feature 3 = 3490 cal B.P.; Feature 4 = 3050 cal B.P.; Feature 9 = 2805 cal B.P.;
Feature 10 = 3685 and 3397 cal B.P.

	Buffalo Hills				South Warners				Bordwell Springs/Pinto Peak/Fox Mountain				Associated Radiocarbon Dates (cal B.P.)
	No.	Mean	SD	CV	No.	Mean	SD	CV	No.	Mean	SD	CV	
Feature 3 House	5	3.7	0.7	0.18	2	4.4	–	–	3	4.9	0.9	0.19	3470
Feature 4 House	7	3.9	0.6	0.15	2	4.7	–	–	1	4.4	–	–	3060
Feature 9 House[a]	7	3.5	0.6	0.18	4	4.2	0.4	0.11	2	4.3	–	–	2780
Feature 10 House	4	3.6	0.3	0.08	2	4.0	–	–	9	4.8	0.4	0.09	3470; 3170
Milling Area	18	3.6	0.4	0.12	8	3.9	0.5	0.13	6	4.8	0.3	0.07	–
Locus 1	8	3.9	0.5	0.13	1	4.3	–	–	–	–	–	–	3774

[a]Excludes high and low readings of 7.4 and 2.2 μm.

abundant than deer, and jack rabbits were found in roughly equal proportions to cottontails. It should be noted, however, that a great deal of variability existed in the mix of species among the houses, especially with regard to jackrabbits and cottontails which were found in reciprocal abundances from one house to the next. In contrast to this variability, all the faunal remains were highly fragmented, showing ample evidence for the extraction of marrow from both artiodactyls and leporids. Finally, plant remains were quite rare except in Feature 10, where the small assemblage was dominated by cattail seeds, followed by lesser amounts of goosefoot, saltbush, and trace amounts of several other taxa. These findings indicate the use of both wetland and dryland habitats.

Obsidian hydration data indicate that the Milling Area was contemporaneous with the houses. Ground and battered stone implements were abundant in this portion of the site, but significant amounts of flaked stone tools were also present. Faunal remains were not abundant and had more leporids than artiodactyl remains. Unfortunately, flotation samples were not collected from this portion of the site, so we know little about the plant macrofossils associated with this assemblage.

DISCUSSION

Findings from Tufa Village provide strong support for Pendleton and Thomas' (1983) prediction that archaeologically visible "facilities of residence" should emerge at about the same time as the development of large-scale hunting complexes like the Fort Sage Drift Fence. The direct linkage between Tufa Village and the drift fence, however, is less certain, especially with regard to the small sample of faunal remains that could be identified to the species level. Findings from Locus 1, which predate the establishment of the houses and probably the fence, are dominated by deer—a species not captured with the use of fences. After about 3500 cal BP, our findings

TABLE 9
Middle Archaic Artifact Assemblage from 26WA2460
AGES: Locus 1 = 3774 cal B.P.; Feature 3 = 3490 cal B.P.; Feature 4 = 3050 cal B.P.; Feature 9 = 2805 cal B.P.; Feature 10 = 3685 and 3397 cal B.P.

	Locus 1		Locus 3 Residential Area					Total
	Surface	Subsurface	Feature 3	Feature 4	Feature 9	Feature 10	Milling Area	
Flaked Stone								
Projectile point	2	3	3	–	9	9	6	32
Drill	1	1	–	–	–	–	1	3
Biface	10	18	6	1	14	18	8	75
Formed Flake tool	–	1	–	–	–	3	1	5
Flake tool	–	12	5	1	8	20	20	66
Core	–	1	–	–	–	–	1	2
Core tool	–	–	–	–	–	–	2	2
Debitage	2	2,439	1,600	175	1,936	3,388	2,267	11,807
Ground and battered stone								
Battered cobble	–	4	–	–	3	1	7	15
Handstone	–	3	6	4	3	9	39	64
Millingstone	1	11	3	1	1	2	18	37
Pestle	–	–	–	–	–	–	–	–
Miscellaneous ground stone	–	4	2	–	3	2	4	15
Miscellaneous								
Baked clay	–	1	1	–	5	31	–	38
Modified bone	–	5	16	–	8	20	4	53
Ochre	–	1	6	–	–	2	–	9
Total	16	2,504	1,648	182	1,990	3,505	2,378	12,223

TABLE 10
Middle Archaic Bifaces from 26WA2460

Stage	Locus 1	Houses	Milling Area	Total
Obsidian				
1	–	–	–	–
2	–	1	–	1
3	–	2	1	3
4	–	2	–	2
5	3	15	1	19
Indeterminate	1	5	2	8
Subtotal	4	25	4	33
Cryptocrystalline silicate				
1	3	–	–	3
2	1	1	–	2
3	2	2	–	4
4	4	–	–	4
5	7	1	–	8
Indeterminate	2	4	–	6
Subtotal	19	8	–	27
Basalt				
1	–	–	1	1
2	–	–	–	–
3	3	5	3	11
4	–	–	–	–
5	2	–	–	2
Indeterminate	–	1	–	1
Subtotal	5	6	4	15
Total	28	39	8	75

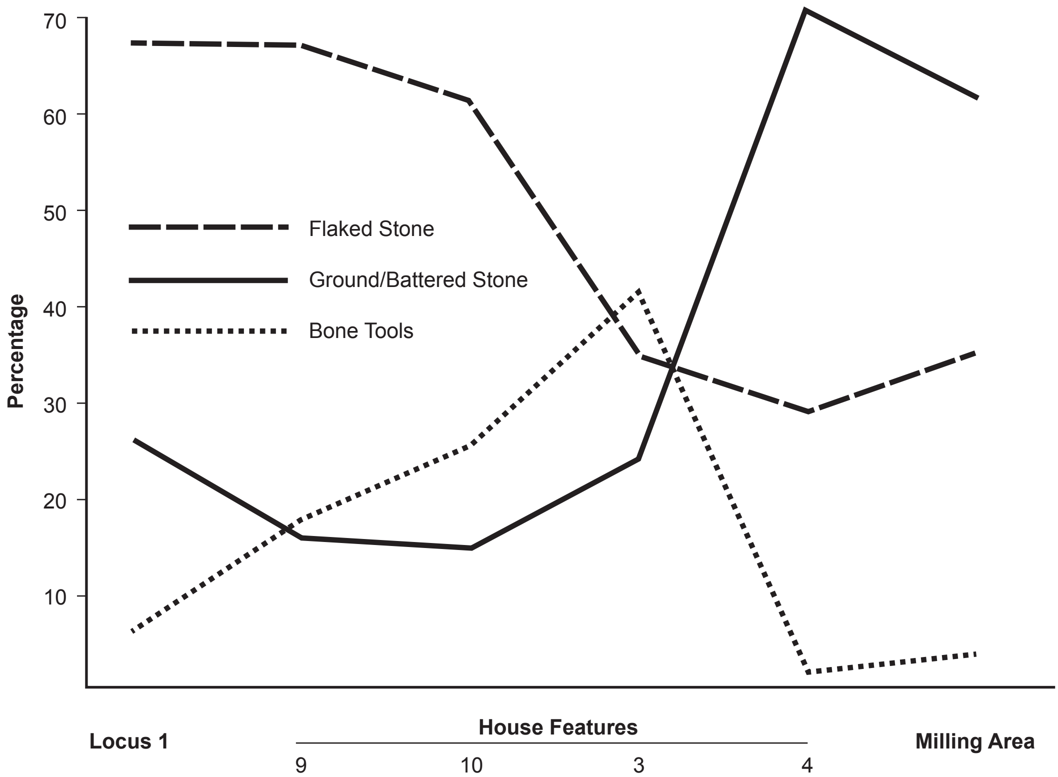

FIG. 25. Relative percentage of flaked stone, ground/battered stone, and bone tools within the Middle Archaic component at 26WA2460.

indicate that bighorn sheep became the focus of hunters, perhaps assisted by the fence. But it seems more likely that the primary target would have been pronghorn based on the ethnographic record (Steward 1938). It remains possible, therefore, that a village site located closer to the drift fence could have more direct linkages to it, and a higher proportion of pronghorn in its assemblage. Although we lack the data necessary to test this hypothesis, we can further evaluate these relationships by placing our findings within the larger archaeological context of the western Great Basin, showing how this local emergence of stable settlements and large-scale hunting facilities appears to be a widespread phenomenon during the Middle Archaic Period.

The Evolution of Domestic Facilities in the Western Great Basin

Prior to the Middle Archaic Period, there is very little evidence for formal domestic structures in the western Great Basin (McGuire, 2002b). These rare cases include possible structures discovered in the Buffalo Hills/Duck Valley areas (Creger, 1991), and a series of houses found in Surprise Valley (O'Connell, 1975), the latter attributed to groups from Columbia Plateau rather than the Great Basin (O'Connell, 1971). Archaeological visibility increases significantly during the Middle Archaic, and McGuire's (2002b) analysis of domestic structures from throughout the region shows that they are relatively large, often have hearths or other internal features, and contain diversified artifact assem-

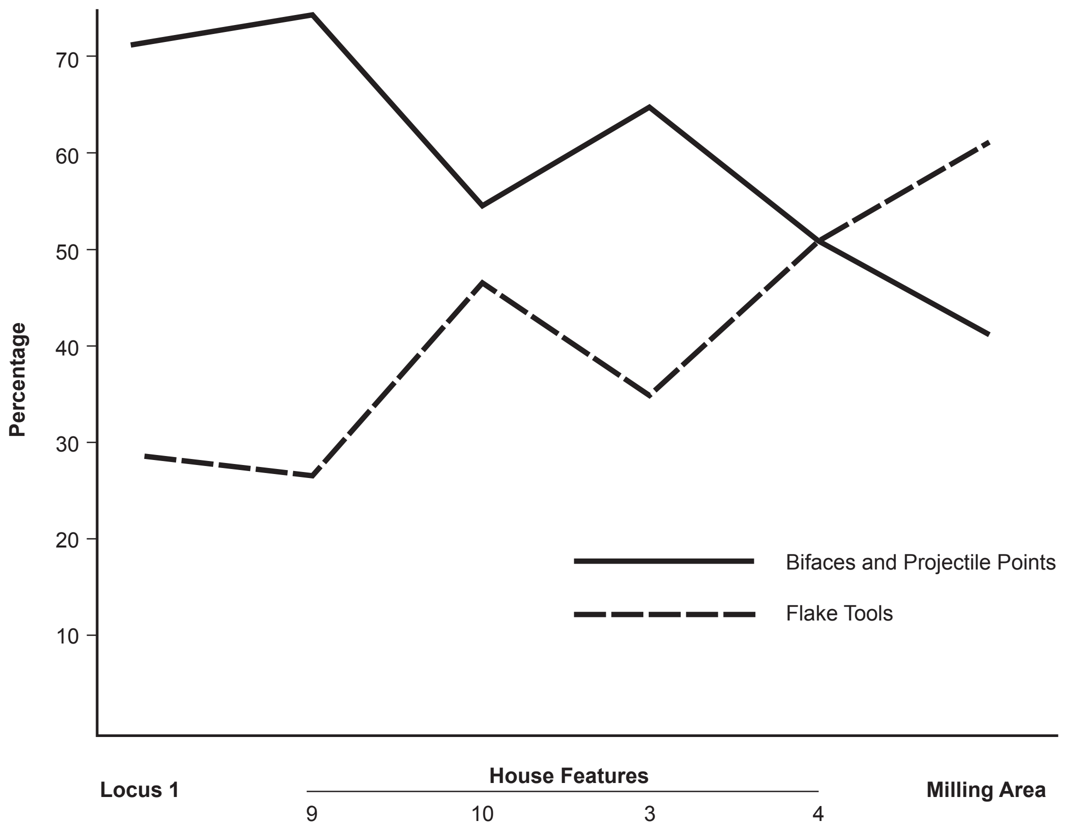

FIG. 26. Relative frequency of bifaces and projectile points versus flake tools.

blages (Riddell, 1960; Elston and Davis, 1972; Elston, 1979; Tuohy and Clark, 1979; Livingstone, 1986; Raven and Elston, 1988; Elston et al., 1994; Delacorte, 1999; Kelly, 2001; King et al., 2001; Zeanah, 2004; Simms, 2008). Evidence for this pattern continues to grow since the work of McGuire (2002b), with relatively large domestic structures found on the southern margins of the Black Rock Desert (McGuire et al., 2017) and at the north end of Owens Valley (Basgall and Delacorte, 2012).

This pattern of settlement continues into the Late Archaic period, with many of the structures suggesting year-round use (Zeier and Elston, 1986: 379; McGuire, 2002b: 31). After about 1000 cal B.P., however, houses tend to decrease in size, lack internal hearths, and contain only thin layers of artifacts and organic residue (Clay, 1996; McGuire, 2002b; Rosenthal, 2000). This decrease in size and complexity continues into the post-500 cal B.P. interval, where the “Numic Pattern” houses:

> appear to represent a substantial break in relation to antecedent pre-Numic domicile forms and community structure. Most striking is their isolation; these structures often occur as solitary elements not tied to larger middens or residential complexes… This is not to say, however, that population densities were less or the intensity of land use significantly diminished; any number of indices (relative number of dated components, comparative frequencies of certain artifact classes, etc.) suggest otherwise…It does seem to be the case, however, that Numic peoples were not aggregating in large residential groups to the degree that their late pre-Numic counterparts were. [McGuire, 2002b: 36]

TABLE 11
Middle Archaic Formed and Simple Flake Tools by Flake Type and Material

Flake Type	Locus 1	Houses	Milling Area	Total
Obsidian				
Cortical	–	1	–	1
Interior	1	3	4	8
Biface thinning	1	5	3	9
Pressure	–	1	–	1
Indeterminate percussion	1	10	5	16
Subtotal	3	20	12	35
Cryptocrystalline silicate				
Cortical	–	–	–	–
Interior	2	–	1	3
Biface thinning	5	3	1	9
Pressure	–	–	–	–
Indeterminate percussion	3	6	1	10
Subtotal	10	9	3	22
Basalt				
Cortical	–	–	3	3
Interior	–	4	1	5
Biface thinning	–	–	–	–
Pressure	–	–	–	–
Indeterminate percussion	–	1	2	3
Subtotal	–	5	6	11
Total	13	34	21	68

TABLE 12
Middle Archaic Flake Tools by Material, Edge, Shape, and Wear Patterns

Shape	Primary and Secondary Edge Wear				Total
	Polish/ Ground	Stepping/ Crushing	Micro-chipping	Edge Flaked	
Obsidian					
Straight	–	7	24	3	34
Convex	1	3	5	3	12
Concave	–	1	2	–	3
Other	–	5	5	4	14
Cryptocrystalline silicate					
Straight	–	3	10	–	13
Convex	–	3	8	3	14
Concave	–	1	–	1	2
Other	–	2	7	1	10
Basalt					
Straight	1	–	2	1	4
Convex	1	1	3	2	7
Concave	–	1	–	–	1
Other	1	–	1	–	2
Total	4	27	67	18	116

TABLE 13
Debitage Material Types from the Middle Archaic Component at 26WA2460
n = count; CCS = cryptocrystalline silicate.

Material	Locus 1		Feature 3		Feature 9		Milling Area		Total
	n	%	*n*	%	*n*	%	*n*	%	
Basalt	237	9.7	568	35.6	411	21.3	692	30.6	1,908
CCS	1,898	77.9	265	16.6	251	13.0	504	22.3	2,918
Obsidian	303	12.4	762	47.8	1,267	65.7	1,066	47.1	3,398
Total	2,438	100.0	1,595	249.4	1,929	100.0	2,262	100.0	8,224

TABLE 14
Debitage Reduction Stages from the Middle Archaic Component at 26WA2460
CCS = cryptocrystalline silicate; *n* = count; % = analystical percent; na = not applicable.

Stage	Locus 1						Feature 9						Feature 3						Milling Area					
	Obsidian		Basalt		CCS		Obsidian		Basalt		CCS		Obsidian		Basalt		CCS		Obsidian		Basalt		CCS	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Core reduction																								
Primary decortication	–	–	3	2.2	–	–	5	0.8	–	–	–	–	–	–	1	1.8	–	–	2	0.5	1	0.5	–	–
Secondary decortication	–	–	–	–	–	–	4	0.7	4	3.3	–	–	1	0.5	2	3.6	–	–	6	1.6	–	–	–	–
Simple interior	4	2.5	27	19.6	16	3.5	5	0.8	23	18.9	4	6.3	5	2.6	3	5.4	1	4.0	1	0.3	11	5.0	8	6.2
Complex interior	–	–	2	1.4	3	0.7	3	0.5	1	0.8	–	–	–	–	–	–	–	–	1	0.3	–	–	2	1.5
Biface reduction																								
Early biface thinning	12	7.5	9	6.5	47	10.7	21	3.6	12	9.8	4	6.3	29	15.3	15	26.8	4	16.0	25	6.7	18	8.1	14	10.8
Late biface thinning	23	14.5	32	23.2	42	9.5	14	2.4	2	1.6	1	1.6	7	3.7	–	–	–	–	41	11.0	40	18.1	8	6.2
Pressure	120	75.5	65	47.1	332	75.5	537	91.2	80	65.6	54	85.7	148	77.9	35	62.5	20	80.0	298	79.7	151	68.3	98	75.4
Diagnostic subtotal	159	100.0	138	100.0	440	100.0	589	100.0	122	100.0	63	100.0	190	100.0	56	100.0	25	100.0	374	100.0	221	100.0	130	100.0
Platform prep./pressure	12	–	8	–	40	–	19	–	2	–	2	–	13	–	7	–	3	–	26	–	34	–	11	–
Bipolar	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Indeterminate percussion	18	–	46	–	135	–	17	–	14	–	19	–	2	–	9	–	3	–	65	–	73	–	22	–
Indeterminate percussion	80	–	40	–	208	–	302	–	162	–	72	–	116	–	58	–	20	–	188	–	114	–	91	–
Shatter	2	–	5	–	19	–	3	–	–	–	3	–	–	–	–	–	2	–	11	–	6	–	19	–
Pot Lid	–	–	–	–	19	–	–	–	–	–	5	–	–	–	–	–	1	–	–	–	–	–	7	–
Total	271	–	237	–	861	–	930	–	300	–	164	–	321	–	130	–	54	–	664	–	448	–	281	–
# of flakes with cortex	1	0.3	6	2.5	–	–	41	1.4	–	–	2	1.2	7	2.2	–	2.5	2	3.7	43	6.5	13	2.9	2	0.8
% of flakes heat treated	na	–	na	–	858	99.7	na	–	na	–	155	94.5	na	–	na	–	44	81.5	na	–	na	–	249	99.2

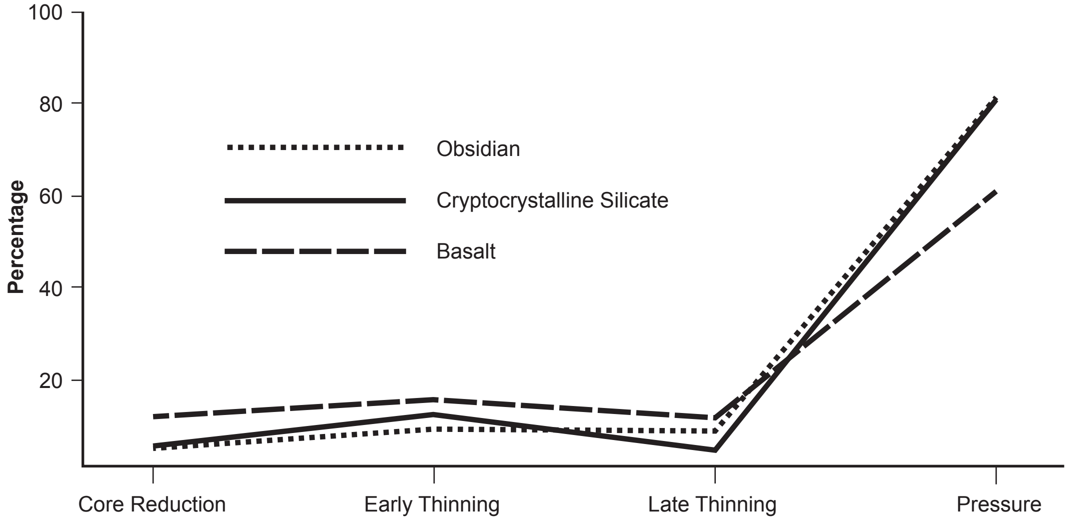

FIG. 27. Debitage reduction stages by material type from selected locations within the Middle Archaic component at 26WA2460.

Tufa Village, while only one place, is consistent with this trend, as there are no late prehistoric houses at the site. It is also important to emphasize that the Fort Sage Drift Fence also falls into disuse after 600 cal B.P.

Obsidian Conveyance in the Middle Archaic

The obsidian conveyance patterns evident at Tufa Village and the Drift Fence reveal a distinct reliance on sources north of Honey Lake Basin (fig. 29 and fig. 30; table 24). The Buffalo Hills source provides 58% of the Middle Archaic obsidian assemblage at Tufa Village (*n* = 94) with the remainder evenly split between South Warners (15%) and the widely distributed lag sources of northwestern Nevada (22%), i.e., Bordwell Springs, Pinto Peak, and Fox Mountain. While the obsidian source profile of the Drift Fence is almost identical to Tufa Village, the proportions of specific sources are somewhat different, and there are a few more single occurrences of far-flung sources at the Drift Fence than at Tufa Village. The recently analyzed sample of obsidian from the Drift Fence artifact assemblage is relatively small (*n* = 27; this accounts for almost all of the obsidian collected from the site), but, of the identifiable obsidian, 52% is from the Bordwell group and 19% was derived from Buffalo Hills. Small percentages and single occurrences are sourced to South Warners (10%), Majuba/Seven Troughs, Sutro Springs, and Mt. Hicks. The reliance on northern sources, via Buffalo Hills, Bordwell, and South Warners areas, is clearly evident in the two obsidian assemblages.

This northern trajectory suggests that obsidian procurement in the Middle Archaic component at Tufa Village occurred during targeted, logistical forays to specifically obtain obsidian, especially at Buffalo Hills but also at Bordwell and South Warners. The temporal aspect of targeted lithic procurement was anticipated by McGuire (2002a: 102), based on data from numerous Middle Archaic obsidian source and hydration profiles from the western Great Basin. While hydration results from the Drift

TABLE 15
Millingstone Data from the Middle Archaic Component at 26WA2460
AGES: Locus 1 = 3774 cal B.P.; Feature 3 = 3490 cal B.P.; Feature 4 = 3050 cal B.P.; Feature 9 = 2805 cal B.P.; Feature 10 = 3685 and 3397 cal B.P.

	Locus 1	Houses	Milling Area	Total
Basalt	5	5	13	23
Granite	3	2	4	9
Other	3	–	2	5
Whole	1	2	3	6
Fragmentary	10	5	14	29
Thin	6	1	1	8
Thick	1	2	6	9
Block	–	1	–	1
Unifacial	8	4	15	27
Bifacial	2	2	3	7
Primary wear surface	–	–	–	–
Flat	2	–	6	8
Dished	5	1	9	15
Basin	–	1	–	1
Average weight[a]	174.1	3,051.1	1,276.9	–

[a]The low and high weights were removed from the analysis due to some extreme outliers in a limited number of locations at the site.

TABLE 16
Handstone Data from the Middle Archaic Component at 26WA2460

	Locus 1	Houses	Milling Area	Total
Basalt	2	21	35	58
Granite	1	–	1	2
Other	–	1	2	3
Whole	–	6	10	16
Fragmentary	3	16	28	47
Unifacial	–	2	19	21
Bifacial	1	8	12	21
Smooth polish	3	13	18	34
Slight polish	–	3	19	22

TABLE 17
Battered Cobble Data from the Middle Archaic Component at 26WA2460

	Locus 1	Houses	Milling Area	Total
Battered	4	4	5	13
Ground	–	2	5	7
Spalled/stepped	2	4	4	10
Flaked	1	–	1	2
Total	7	10	15	32

TABLE 18
Modified Bone From the Middle Archaic Component at 26WA2460
Ages: Locus 1 = 3774 cal B.P.; Feature 3 = 3490 cal B.P.; Feature 9 = 2805 cal B.P.; Feature 10 = 3685 and 3397 cal B.P.

	Locus 1	House Floors		Feature 10	Milling Area	Total
		Feature 3	Feature 9			
Awl	1	7	7	–	6	21
Awl/needle	–	1	1	–	–	2
Needle	1	–	–	–	1	2
Gouge	1	–	–	–	–	1
Incised bone	–	–	–	1	–	1
Tube beads	–	–	–	2	3	5
Tube Fragments	–	–	–	–	2	2
Indeterminate	2	8	8	5	8	31
Total	5	16	16	8	20	65

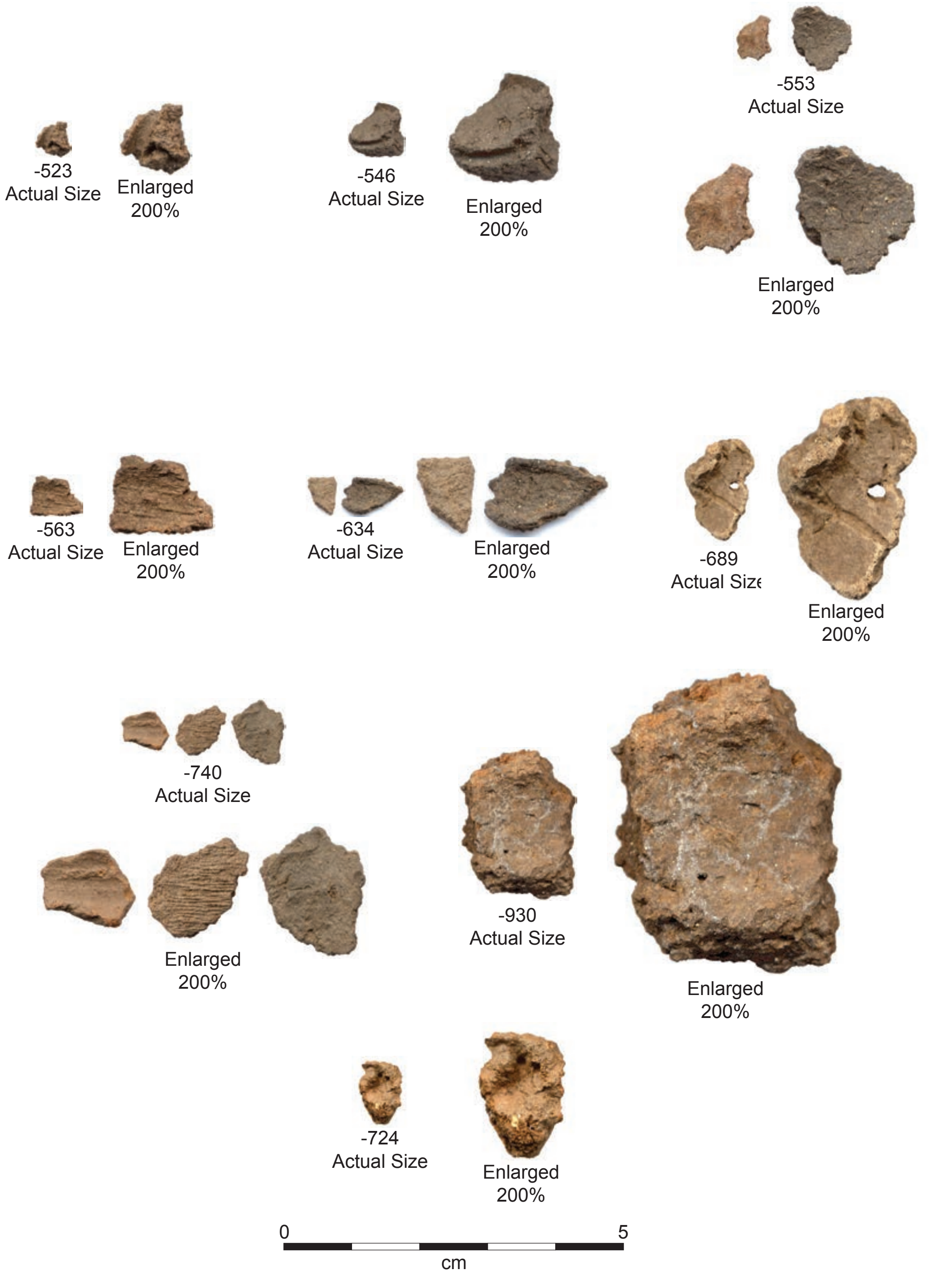

FIG. 28. Baked clay with impressions from 26WA2460.

TABLE 19

Charred Plant Remains from the Middle Archaic Component at 26WA2640

AGES: Locus 1 = 3774 cal B.P.; Feature 3 = 3490 cal B.P.; Feature 4 = 3050 cal B.P.; Feature 10 = 3685 and 3397 cal B.P.; nd = No data.

		Locus 1	Locus 3 Houses				Total
			Feature 3	Feature 4	Feature 10		
					Floor[a]	Floor[b]	
Atriplex sp.	Saltbush	–	–	–	9	1	10
Chenopodium sp.	Goosefoot	–	–	–	1	–	1
Deschampsia sp.	Hairgrass	–	–	1	–	1	2
Juncus sp.	Rush	–	–	–	2	4	6
Mentzelia sp.	Blazing star	–	–	–	2	–	2
Purshia tridentata	Antelope bush	–	2	2	–	–	4
Suaeda sp.	Seepweed	–	–	–	1	1	2
Typha sp.	Cattail	1	1	–	60	4	66
Chenopodiaceae	Goosefoot family	–	–	–	15	2	17
Poaceae	Grass family	–	2	–	–	4	6
Unidentified seeds		–	–	–	12	–	12
Unidentified seed fragments		–	1	–	3	4	8
Total		1	6	3	105	21	136
Sample number		14	2, 4, 5	9	11	13	–
Sample volume (liters)		nd	34.9	30.0	50.8	nd	–

[a]From the Feature 10.15 charcoal stain.
[b]From the Feature 10.13 fire-affected rock concentration.

TABLE 20

Middle Archaic Faunal Remains by Count from 26WA2460

AGES: Locus 1 = 3774 cal BP; Feature 3 = 3490 cal BP; Feature 9 = 2805 cal BP.

	Locus 1	Houses		Milling Area	Total
		Feature 9	Feature 3		
Artiodactyl	47	46	10	15	118
Mountain sheep	–	32	2	2	36
Deer	11	9	–	1	21
Pronghorn	–	–	–	–	–
Subtotal	58	87	12	18	175
Lagomorph	66	127	184	66	443
Jackrabbit	–	15	5	3	23
Cottontail	2	8	15	2	27
Subtotal	68	150	204	71	493
Bobcat	–	–	–	–	–
Dog/coyote	–	3	–	–	3
Subtotal	–	3	–	–	3
Bird	22	4	–	1	27
Duck	–	1	–	1	2
Subtotal	22	5	–	2	29
Fish	8	1	12	2	23
Minnows/suckers	1	–	8	–	9
Cutthroat trout/trout	–	3	1	–	4
Tui chub	–	2	1	–	3
Subtotal	9	6	22	2	39
Reptiles	1	64	29	4	98
Rodents/insectivores	4	10	23	2	39
Total	162	325	290	99	876

TABLE 21
Unidentifiable Faunal Remains from 26WA2460

	Locus 1	Houses		Milling Area	Total
		Feature 9	Feature 3		
Mammal					
Medium to large (deer-sized)	743	329	287	170	1,529
Medium (dog-sized)	3	9	1	–	13
Small to medium (rabbit-sized)	772	1,233	1,246	528	3,779
Small (rodent-sized)	3	–	15	–	18
Indeterminate size	255	320	203	153	931
Vertebrate					
Indeterminate size	188	606	459	140	1,393
Total	1,964	2,497	2,211	991	7,663

TABLE 22
Body Part Frequencies for Artiodactyl and Medium-to-Large Mammal

	Locus 1	Locus 3 Features	Milling Area	Total
Artiodactyl[a]				
Cranial	4	3	–	7
Teeth	15	12	9	36
Vertebrae/ribs	–	1	–	1
Scapula/pelvis	–	–	–	–
Long bone	11	–	1	12
Metapodial	6	3	1	10
Foot	3	2	–	5
Total	39	21	11	71
Medium-to-large mammal				
Cranial	5	2	2	9
Teeth	–	1	–	1
Vertebrae/ribs	1	–	–	1
Scapula/pelvis	–	–	–	–
Long bone	33	26	14	73
Metapodial	1	–	–	1
Foot	–	–	–	–
Total	40	29	16	85

[a]Includes bighorn sheep, mule deer, and other artiodactyl.

TABLE 23
Body Part Frequencies for Leporids and Small-to-Medium Mammals

	Locus 1	Locus 3 Features	Milling Area	Total
Leporids				
Cranial	23	132	36	191
Teeth	12	82	11	105
Vertebrea/ribs	–	–	–	–
Scapula/pelvis	5	10	3	18
Long Bone	15	61	11	87
Metapodial	3	14	2	19
Foot	9	56	8	73
Total	67	355	71	493
Small-to-medium mammal				
Cranial	5	4	15	24
Teeth	–	2	2	4
Vertebrea/tibs	8	46	8	62
Scapula/Pelvis	3	8	7	18
Long bone	730	2,110	428	3,268
Metapodial	3	9	2	14
Foot	3	5	5	13
Total	752	2,184	467	3,403

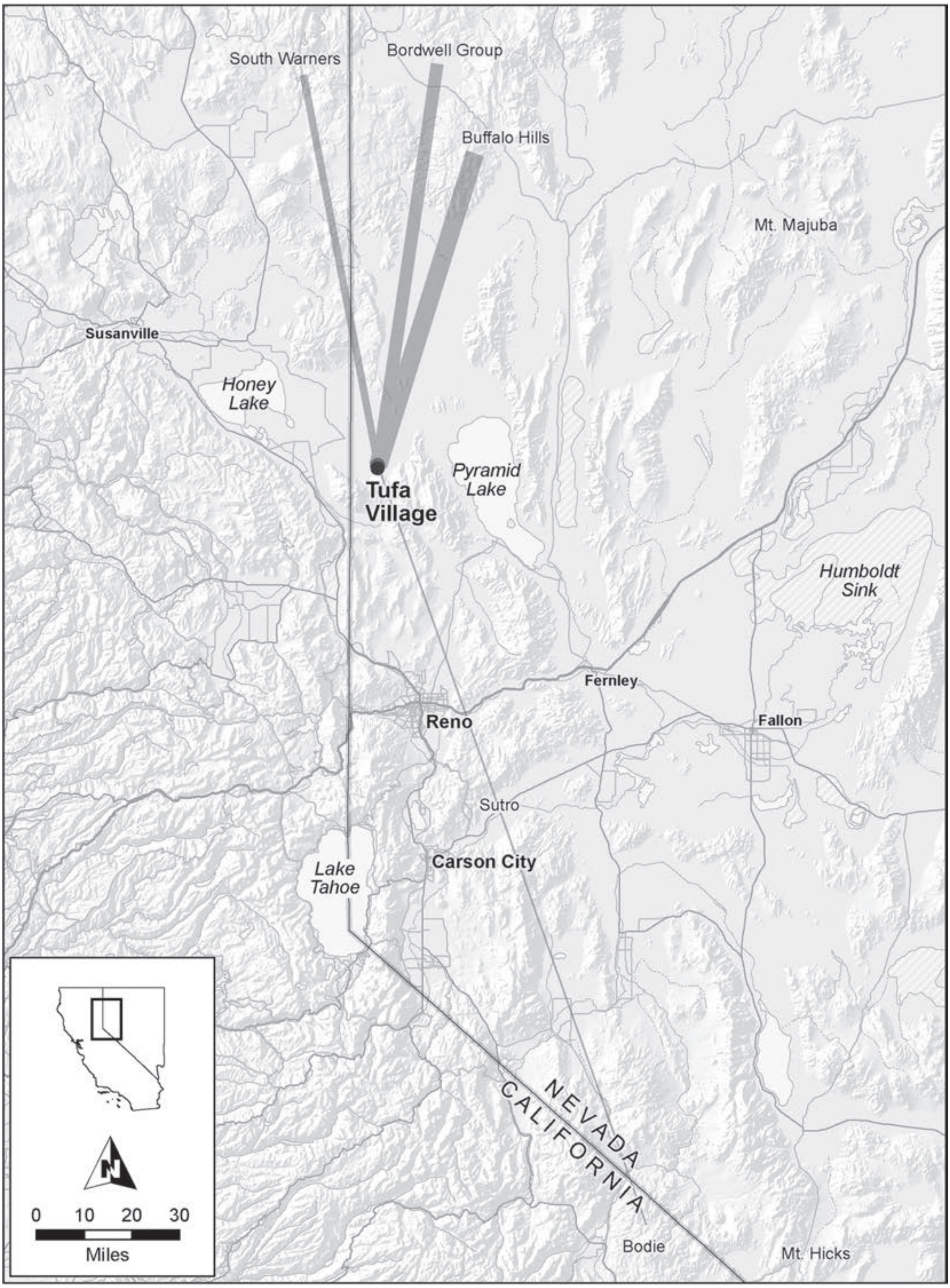

FIG. 29. Obsidian conveyance patterns evident at Tufa Village.

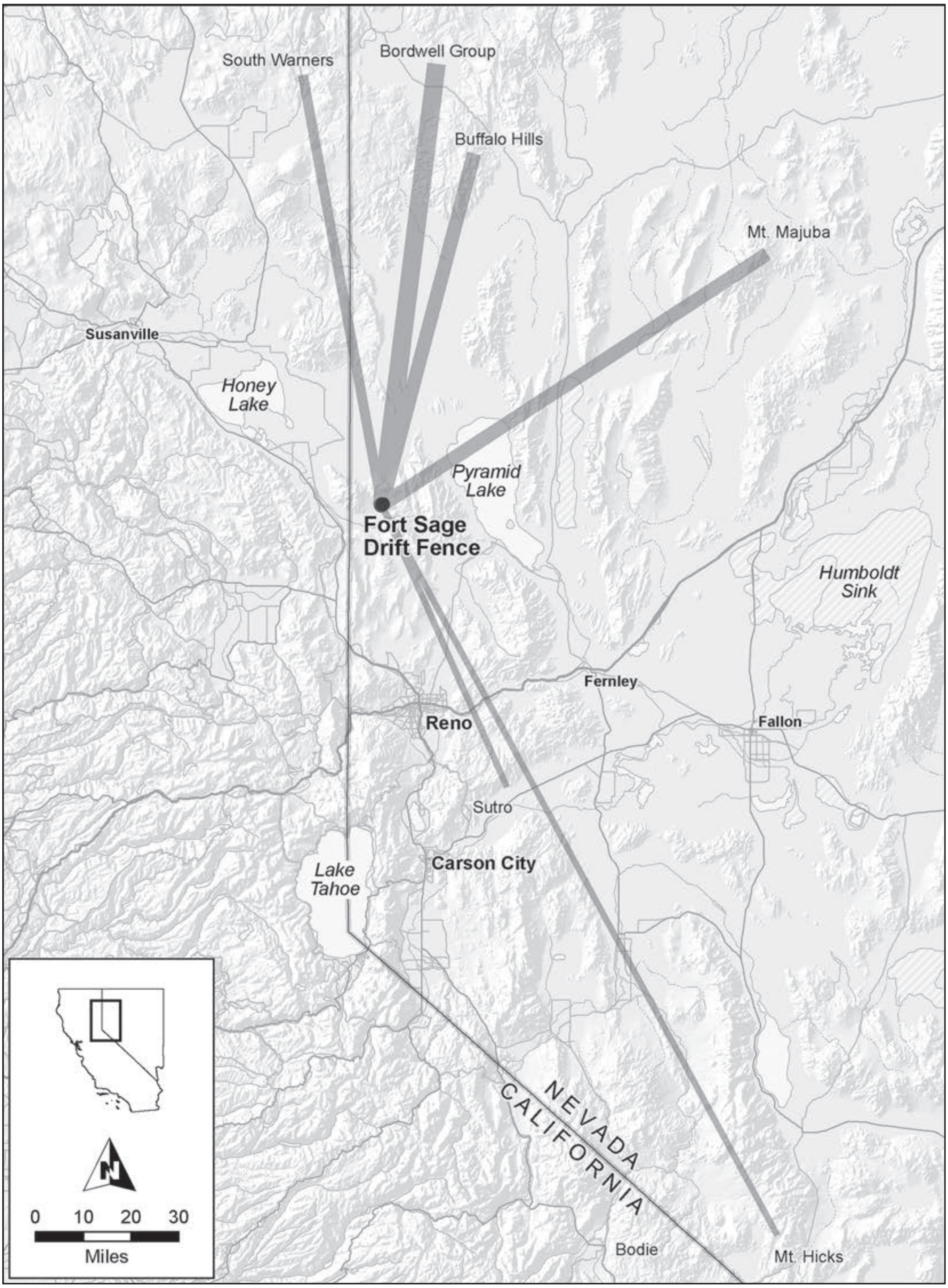

FIG. 30. Obsidian conveyance patterns evident at Fort Sage Drift Fence.

TABLE 24
Compendium of Obsidian Analyses from the Drift Fence and Middle Archaic Loci at Tufa Village
n = Count; SD = standard deviation; CV = coefficient of variation.

Source	Fort Sage Drift Fence			Tufa Village					
				Locus 1			Locus 3		
	n	Readings	Mean (SD, CV)	*n*	Readings	Mean (SD, CV)	*n*	Readings	Mean (SD, CV)
Bodie Hills	1		–	–	–	–	1	4.8	–
Bordwell Group/ NW Nevada	11	3.1, 3.4, 4.0, 4.0, 4.8, 5.8, 6.4, 7.0, 7.4	5.4 (1.8, 33)	–	–	–	21	4.1, 4.3, 4.3, 4.4, 4.4, 4.4, 4.5, 4.6, 4.6, 4.6, 4.7, 4.7, 4.8, 4.8, 4.9, 5.0, 5.0, 5.4, 5.4, 5.6, 6.0	4.8 (0.5, .10)
Buffalo Hills	4	(1.7), 3.5, 6.2, (6.8) [a]	4.5 (2.4, .52)	9	3.1, 3.3, 3.6, 4.2, 4.2, 4.2, 4.2, 4.2, 4.3, 4.4	3.9 (0.5,.13)	43	2.2, 2.6, 2.6, 3.0, 3.1, 3.1, 3.1, 3.1, 3.1, 3.2, 3.2, 3.2, 3.3, 3.4, 3.4, 3.5, 3.5, 3.5, 3.5, 3.6, 3.6, 3.6, 3.6, 3.6, 3.6, 3.6, 3.7, 3.8, 3.8, 3.8, 3.9, 3.9, 4.0, 4.0, 4.0, 4.1, 4.3, 4.3, 4.4, 4.4, 4.8, 4.8, (7.4)	3.6 (0.6, .15)
Majuba/Seven Troughs	3	13.8, 14.1	14.0 (.21, .02)	–	–	–	–	–	–
Mt. Hicks	1	4.0	–	–	–	–	–	–	–
South Warners	2	3.5, 3.9	3.7 (.28, .08)	1	4.3	–	18	2.9, 3.6, 3.7, 3.9, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.3, 4.4, 4.4, 4.4, 4.4, 4.7, 4.7, 4.9	4.1 (0.5, .11)
Sutro Spring	1	4.2	–	–	–	–	–	–	–
Unknown	4	–	–	–	–	–	1	3.1	–

[a]Statistical outliers in parentheses.

Fence lack the utility to temporally constrain the general use of this time-transgressive feature, the earliest (i.e., thickest) rim readings on Bordwell Group and Buffalo Hills artifacts are consistent with the presence of Gatecliff points as the fence's earliest temporal indicators and, in all likelihood, Middle Archaic construction and initial use of the facility (Pendleton and Thomas, 1983). A conveyance corridor through the Smoke Creek Desert and beyond the Buffalo Hills logically connects the northern Nevada sources to the two sites (village and fence) on the southern perimeter of Honey Lake Basin. Targeted use emanating from residential bases, such as Tufa Village, is a hallmark of a Middle Archaic "collector-like" system; a regional system in which the Drift Fence played a key role.

CONCLUSIONS

Archaeological findings from Tufa Village, combined with the larger regional archaeological record, show that habitation sites composed of multiple house structures were established in the western Great Basin during the Middle Archaic period, and around 3700 cal B.P. in the Fort Sage Mountains. These findings are consistent with Pendleton and Thomas' (1983) original prediction that construction of a major facility like the Fort Sage Drift Fence would have been associated with a "collector-like" settlement system composed of centralized residential bases and logistical hunting organization. The small sample of faunal remains that could be identified to the species level, however, shows that bighorn sheep and not pronghorn were the focus of hunters. The absence of pronghorn, which were commonly procured with brush fences in ethnohistoric times, is surprising given the similar configuration of the Fort Sage Drift Fence, and probably indicates that there are other residential areas closer than the 8 km distance between Tufa Village and the Fort Sage Drift Fence with a more direct linkage to the fence. But it should also be noted that the low frequency of pronghorn in archaeological sites is not that unusual, as Janetski's (2011: 281–283) comprehensive review of western Great Basin findings shows that they make up less than 11% of these assemblages relative to deer and bighorn sheep.

Evidence for logistical hunting during the Middle Archaic, including the construction of intercept facilities, goes beyond the Fort Sage Mountains (Hockett et al., 2013). This pattern has been identified in the central (Pendleton and Thomas, 1983; McGuire and Hatoff, 1991) and eastern (Pendleton and Thomas, 1983; McGuire et al., 2004; Hockett, 2005; Jensen, 2007; Hockett and Murphy, 2009) Great Basin, as well as in the upland areas surrounding the Owens Valley (Stevens, 2005; McGuire et al., 2007).

The rise of village life in the Great Basin has also been linked to other, nonsubsistence aspects of the regional Middle Archaic. The trans-Sierran exchange of obsidian—mined, produced, and exported by western Great Basin peoples—came and went during this same interval (Gilreath and Hildebrandt, 1997, 2011; Hildebrandt and McGuire, 2003). The same is true for the production of rock art and other forms of artistic and ritual expression (Heizer and Baumhoff, 1962; Steward, 1968; Gilreath and Hildebrandt, 2008). It should be no surprise that the unique cache of severed bighorn sheep heads in Loyalton Rock Shelter dates to this period (Wilson, 1963). Located in the low ranges of the northern Sierra Nevada, Loyalton is only 50 km southwest of the Fort Sage Mountains, and its offering is not dissimilar to the sheep skull placed on the floor of Feature 10 at Tufa Village.

These findings indicate that the Middle Archaic economic adaptation, and the larger cultural phenomenon connected to it, were unique to this period of Great Basin prehistory, and it is important that we recognize this important development. Pendleton and Thomas (1983) should be applauded for identifying this possibility over three decades ago, and we are happy to have had the opportunity to uncover an archaeological record that not only confirms many of their expectations, but also adds to the growing body of information from this significant period of Great Basin prehistory.

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