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# The Structure of the Bustos Wickiup Site, Eastern Nevada

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**E**THNOARCHAEOLOGY has shown, contrary to earlier assumptions, that under some circumstances the trash of living is found most concentrated where activities and perhaps residence did not take place (e.g., Gould 1966; Ammerman and Feldman 1974; Gallagher 1977; Gifford 1977; Binford 1978; Kent 1984). Also, archaeologists increasingly understand that the presence, size, density, and distribution of refuse in relation to structures hold implications for interpretations of site function (e.g., Binford 1978, 1987; Kent 1984; O'Connell 1987; Simms 1988; Fisher and Strickland 1989; Metcalfe and Heath n.d.; Simms and Heath n.d.).

Intriguing as "living archaeology" is, the ethnoarchaeological study of site formation processes among simple societies is rapidly disappearing. In many mid-latitude regions of the world, such as the Great Basin, the opportunity vanished long ago to simultaneously observe behavior and the consequent formation of sites. However, the pursuit of some semblance of ethnoarchaeology in the Great Basin would be more than an exercise in nostalgia. An application of such a perspective to the Great Basin would contribute to a body of data accumulating on a worldwide scale. It would also add a greater cross-cultural dimension to the direct historical approach that has so greatly influenced the interpretation of the archaeological record in the Great Basin.

While aboriginal ethnoarchaeology will never be done in the Great Basin, there may be circumstances where archaeologists can come close to the "real thing" by investigating

recent sites that exhibit excellent preservation as if they were ethnoarchaeological situations. One such case is the Bustos wickiup site near Ely, Nevada (Fig. 1). The site consists of the semi-erect remains of five juniper log structures likely dating to the last half of the eighteenth century (Figs. 2-5). Strikingly few artifacts were found in and among the structures, but large areas with high densities of chipped stone debris and temporally late diagnostic artifacts were found surrounding the site. Additional sites in the drainage include lithic scatters, seven stone rings interpreted as pine nut storage facilities, scattered ceramics and metates, and occasional timbers possibly once part of other structures (Fig. 6). Also present are distinctive stumps left when fire and stone axes were used to cut logs for the structures. In a romantic sense, the only things missing are the people, presumably the Shoshoni. From an ethnoarchaeological perspective, their absence only conditions the line of questioning about site formation processes—it does not eliminate the chance to study the relationships between the material remains and aspects of the behavior that produced them, the substance of ethnoarchaeology.

This paper describes an experiment in which the Bustos site is treated as if it were an ethnoarchaeological situation in addition to being an interesting example of a late prehistoric site in the Great Basin. Ethnoarchaeological studies of site formation processes shaping the structure of sites (e.g., Kent 1984, 1987; O'Connell 1987) have been important to our understanding of site function, task organization, duration of occupa-

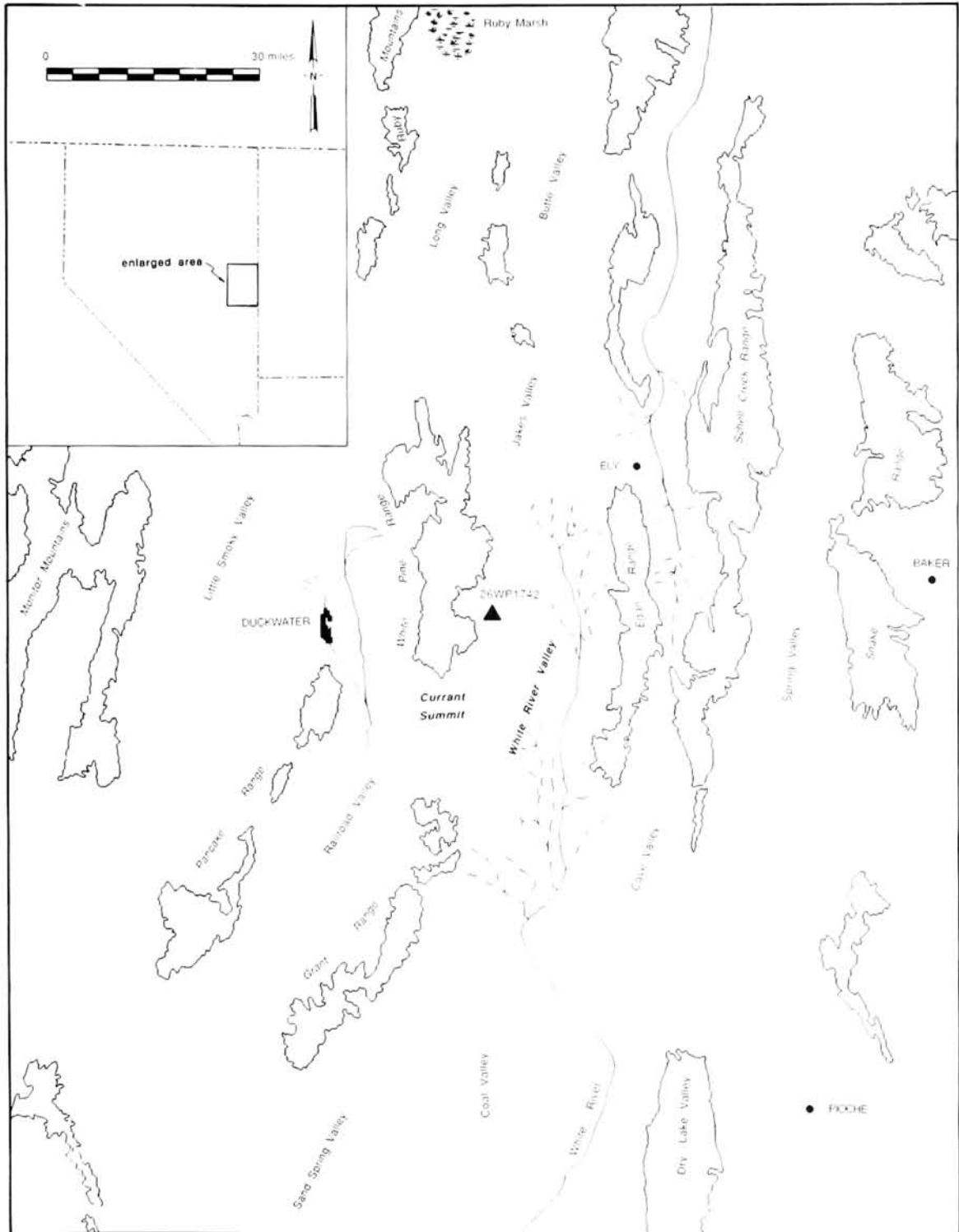


Fig. 1. Map of eastern Nevada locating the Bustos site.

tion, seasonality, and the role of storage. The archaeological visibility of lightly constructed, perishable structures is another issue. A high percentage of past hunter-gatherer residential behavior has likely left archaeologists with a disproportionate number of lithic scatters, while decayed structures, requiring far more attention to locate, go unrecognized. Inferences from ethnoarchaeology conducted in other regions of the world have been applied to a case in the northeastern Great Basin to help identify the location of small structures whose superstructures have vanished (Simms and Heath n.d.). These kinds of studies hold implications for the use of negative evidence (i.e., the absence of residences) to interpret site function, as well as the assessment of significance, and policies for survey and test excavations in cultural resource management.

Insights from the Bustos case are compared to other examples of hunter-gatherer structures in California, Colorado, Nevada, and Utah. Since our goals should never be parochial, and since the relationships between refuse and structures may be similar for *portable* structures as for *perishable* ones, comparisons are also made to tipi rings on the High Plains. Similar to a study of bedouin portable tent encampments in Arabia (Simms 1988), these data suggest the presence of useful, cross-cultural relationships between habitations and refuse. They show that a paucity of artifacts in and near such habitations is common, but variability is apparent. To some researchers, the rarity of artifacts in these kinds of sites, relative to other archaeological contexts, has fostered the view that little can be learned in such situations. Here, the view is taken that variability in the relationship between refuse and small, lightly constructed structures opens, rather than closes, the door to interpretation by offering the potential to account for the variability in behavioral terms.

### THE BUSTOS SITE

The Bustos wickiups (26WP1742), located on the Humboldt National Forest, were discovered in 1979 by avocational archaeologists Richard "Rab" and Debbie Bustos of Ely, Nevada, and recorded in 1985 (McFarlin 1985). Investigations by the author included three visits in 1986, and again in June, 1989, to map the site, point-plotting all artifacts; excavate a structure and its immediate vicinity; excavate a subsurface transect across the site; survey the drainage to record all finds; excavate a stone ring; and produce an educational videotape on the work (DeSart et al. 1986).

### Ethnographic and Historical Context

The site occupies an area of low hills separating Jakes Valley and White River Valley (Figs. 1 and 5). Steward (1938:125) identified the area as within the territory of the Western Shoshoni during the late nineteenth century. The closest food-named groups (see Fowler [1982] for a discussion of this concept) to the Bustos site are the Tsaitekkaneen ("tule eaters") in the Duckwater area and the Yuainankuhteen ("the south or warm side"), northwest of Duckwater (Janetski 1981). Kelly's (1934) placement of the Southern Paiute boundary in the vicinity of Pioche and Dry Lake Valley (Fig. 1) concurs with a Shoshoni affiliation for the Bustos vicinity, although the area could be considered to be within a transition zone thought by Steward (1970) to occur along all cultural boundaries in the Great Basin. Transition zones are characterized by increased frequencies of bilingualism and intermarriage (Steward 1970:124); thus, the region could have been used by people of varying linguistic and social contexts, depending on the particular years or decades in question.



Fig. 2. Structures at the Bustos wickiup site. Upper, Structure 2; lower, Structure 3.



Fig. 3. Site features. Upper, excavated hearths; lower, partially cut juniper tree with the stone ax found near its base.

Steward had little to say about the Shoshoni in the vicinity of the Bustos site (1938: 147): "Jakes Valley and White Sage Valley (White River Valley). Little information is available about these valleys, which probably had few inhabitants. HJ said that two chiefs, Padugutsa kahudua (mud face ?) and To mai (corn on his foot) served Jakes and probably White Sage Valley." Steward's descriptions for eastern Nevada also suggest that people using Jakes and White River valleys associated with groups to the north in Butte and Long valleys for communal antelope hunts. This is consistent with ethnographic research for central Nevada indicating fluidity in social associations and fluctuations in group size depending on the tasks at hand.

Railroad Valley, immediately west of the White Pine Range (Fig. 1) and the location of the Duckwater Reservation, had a significant population during the period documented by Steward (1938:117-121). At that time, villages were scattered along the edges of the valley near springs and the surrounding terrain was utilized for pine nut collection and hunting. The White Pine Range contains numerous natural springs such as the one near the Bustos site. Also, the extensive pinyon-dominated forest that has been demonstrably present for at least several centuries around the Bustos site could have been a subsistence attraction. Thus, while Steward (1938) did not know of anyone actually inhabiting the Bustos area, the White Pine Range seemed to be used for individual hunting of game and for pine nut collection/storage. These activities leave contrasting archaeological referents with pine nut procurement most likely represented by the Bustos case.

The Bustos site yielded no Euro-American artifacts, nor were metal axes used to cut logs for the structures. The earliest documented visitor to the area was Jedediah Smith in 1827, who crossed the White Pine Range via

Currant Summit (Wheat 1954) only 15 km. south of the site (Fig. 1). However, the area was well south of the typical haunts of fur trappers and off the beaten pioneer trails of the ensuing decades. In fact, this portion of Nevada was one of the last areas in the continental United States to come into continuous contact with Euro-Americans (Fowler and Fowler 1971:98). The Bustos site not only predates the period of direct contact in the region, but also seems to have been early and remote enough to have been unaffected by the diffusion of Euro-American material culture during the late eighteenth and early nineteenth centuries, before the onset of face-to-face contact.

#### Natural Setting and Depositional Characteristics

The Bustos site is located at an elevation of 1,996 m. (6,550 ft.) on the south slope of a shallow ridge near the base of the eastern flank of the White Pine Range (Fig. 5). Vegetation is characterized by a mature pinyon-juniper forest including pinyon trees over 350 years old (dated by coring recently dead trees) with a sparse understory of sagebrush (*Artemisia tridentata*) and bitterbrush (*Purshia tridentata*). A narrow strand of willow (*Salix* spp.) and rabbitbrush (*Chrysothamnus nauseosus*) inhabit the drainage south of the site, fed by a spring several kilometers away. This stream was observed flowing past the site in May, 1986, and had dried by August, although surface water was present upstream throughout the summer.

The aboriginal clearing of the forest to provide timbers for the structures gives the site a roughly circular appearance measuring 60 meters in diameter. Regrowth has occurred, but the cleared area remains noticeable (Fig. 5). The site sediments consist of white sands and gravels of limestone, with finer sediments eroded away by slope wash and

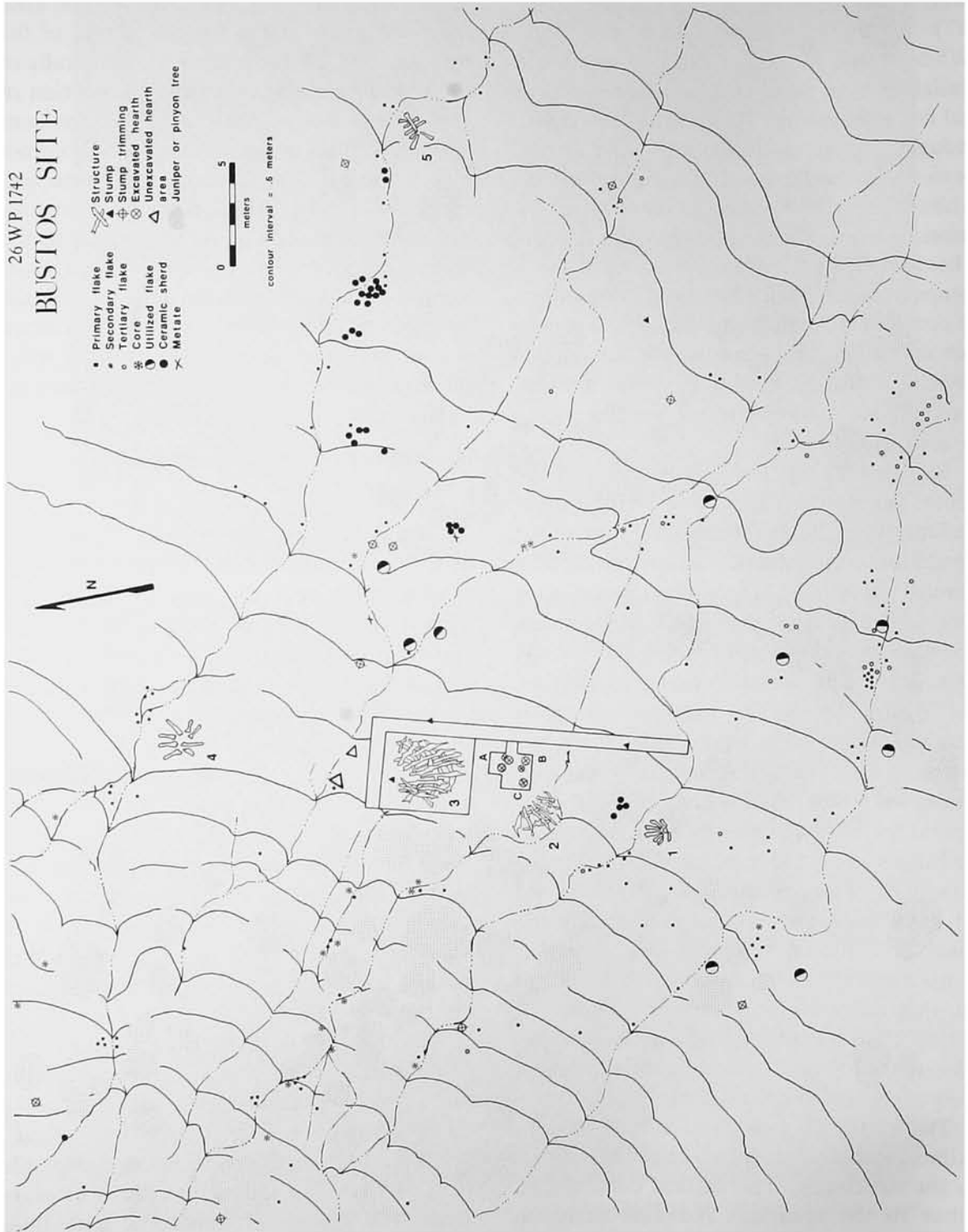


Fig. 4. Map of the Bustos site showing distribution and type of surface artifacts.





Fig. 5. Site vicinity from the ridge to the south showing the area of structures at dead center. Note line of tree regrowth identifying zone of aboriginal logging.

wind. These sediments are lighter and coarser than those of the surrounding area, perhaps a result of aboriginal logging and use, which may have accelerated erosion.

Knowledge of the depositional character of the site and whether artifacts are likely to be visible on the surface is significant to a study of site structure. Fortunately, the site appears to be largely erosional/deflationary. Six shallow rills traverse the site and yield higher densities of artifacts, suggesting concentration of material via deflation. Some structural timbers are exposed while the bases of others have been buried by sedimentation and by duff fallen from the trees. In sum, the site area has been alternately and differentially buried and exposed, with the current trend

toward erosion/deflation of the surface.

### The Structures

Each structure is discussed with attention given to the means of construction, an estimate of internal living space, and the direction of doorways. Placement of logs, heights of log intersection, and tree growth patterns were used to assess whether live trees were incorporated into the structures. The logs are often broken and of uneven diameters, so ranges of size are given. The reported diameters are for the lower trunk areas, not including the bulging root ends. No evidence of roofing material was observed. Despite scraping through the duff, there was no evidence of hearths inside any of the struc-

tures, although hearth areas were found in front of the entrances to Structures 2 and 3.

Structure 1 consists of five 3-m.-long juniper logs 10-20 cm. in diameter. Four logs lean against a fifth vertical support, creating a small lean-to. The center post is buried, possibly after abandonment, and the other logs have slumped to an apex only 0.8 m. above the present ground surface. Adjusting for deposition and slumping, the internal dimensions of the original structure may have been as much as 2 m. in diameter and at least 1.5 m. high. This lean-to would have opened broadly from the east to the south. All of the logs were chopped with a stone ax and were burned, probably during felling. Two brownware ceramic sherds came from within the structure (McFarlin 1985). The structure was not excavated beyond ascertaining the depth of the center post and scraping the surface for evidence of a hearth.

Structure 2, one of the two largest, incorporates 14 juniper and 2 pinyon logs. The logs range from 1.5 to 4 m. long and from 8 to 25 cm. in diameter. They form a semi-circular, conical pattern slumping against a large juniper tree and a smaller pinyon tree. These trees now obstruct the doorway and were probably not present during use. The living space was 3+ m. in diameter and no more than 2 m. high. Most of the logs are very weathered, but the undersides exhibit burning and chopping from their felling. Some were felled at the trunk while others were felled at the roots. The structure opened to the northeast, toward an area of six hearths and roasting pits located one to three meters away (Fig. 4). These were excavated and are described in a later section. No artifacts were found on the surface within the structure and it was not excavated.

Structure 3, the largest and best preserved, and the one chosen for excavation, consists of 20 juniper logs and 4 pinyon logs. The logs

range in length from 1 m. (some have broken into small sections) to over 4.5 m., with most in the 2.5-3.5-m. range. The diameters range from 10 to 30 cm., but most are on the order of 15-20 cm. Construction proceeded by arranging four large, unbranched logs in a conical framework, then adding smaller forked logs to form an intertwined mesh. A juniper tree grows out of the structure today, but its age suggests it could not have been large enough to have been a part of a structure utilizing such large timbers (see section on Chronology). Its branching patterns show that the structure slumped as the tree grew, creating an apparent association. The living space was about 4.5 m. in diameter by 2+ m. high. As with Structure 2, the logs were less weathered on their undersides and showed considerable burning of the trunks and branches. Eight had been felled at the roots, but most had been cut at the trunk, or had the root butts trimmed off. Others had been partially cut along the trunks as well as at the roots. The structure opens to the north toward two hearth areas (unexcavated) located 3.5 m. away (Fig. 4).

Structure 4 differs from the others in that eight juniper logs are arranged conically with their butt ends up. The logs are separated at the apex by the growth of two juniper trees, their growth possibly parting the logs. The ages and growth habits of the trees suggest that one tree may have been present prior to construction (see section on Chronology). The logs are 2-3 m. long and 15-25 cm. in diameter. Like the others, they exhibit burning on their less weathered undersides showing they have retained their general orientation for some time. All eight had been felled by cutting the roots. Perhaps these logs were being stored and did not represent a habitation. No hearth area was visible inside, or on the surface nearby. Or, perhaps this was a structure merely different from the

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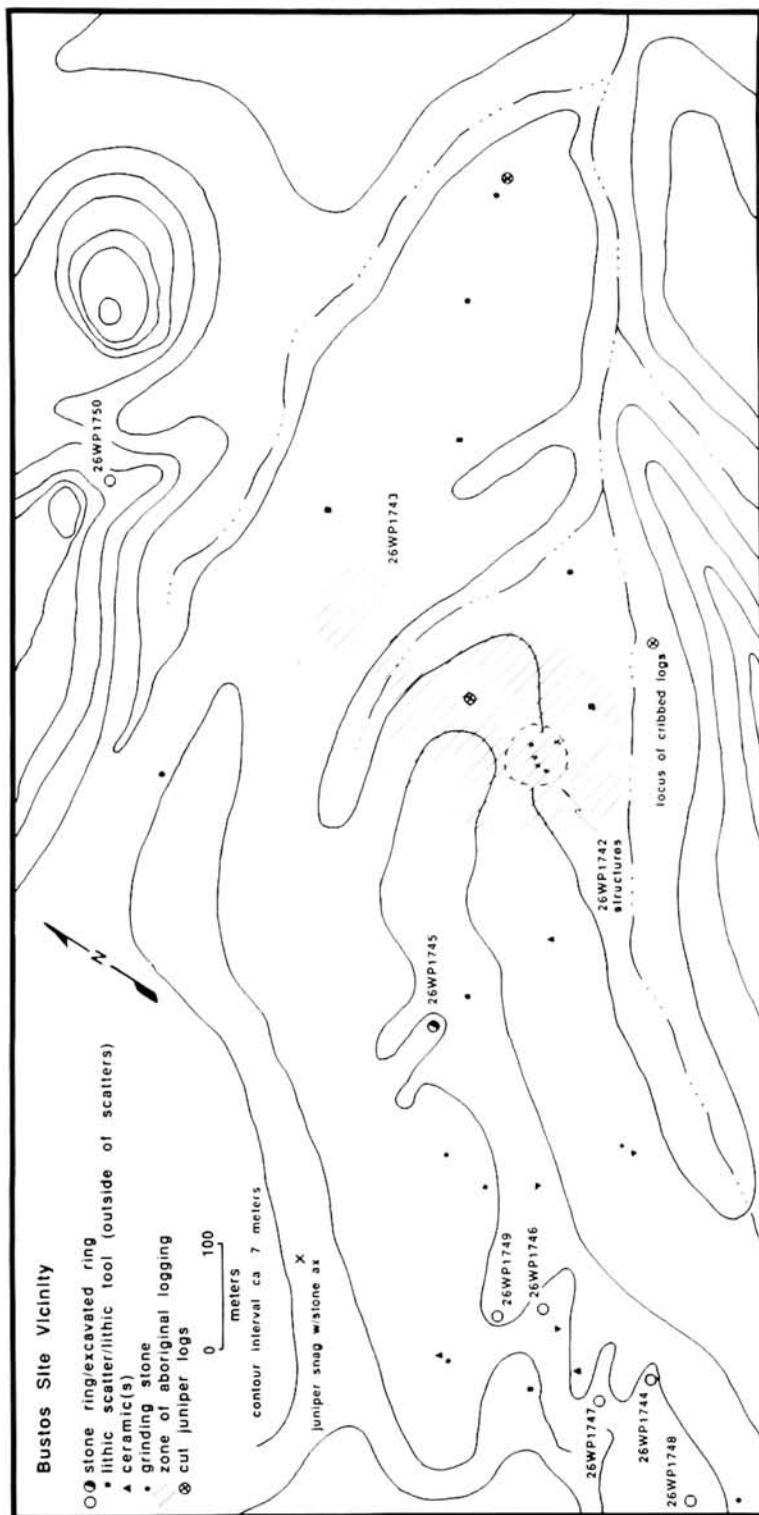


Fig. 6. Map of drainage showing surrounding sites and isolated finds.

others in style of construction. A possible doorway, but less clear than the others, opened to the north. The internal dimensions would have been 3 m. in diameter by 2+ m. high.

Structure 5 has collapsed, but the pattern suggests the remains of a conical wickiup. Eight juniper logs ranging from 2 to 2.7 m. long and from 7 to 30 cm. in diameter are badly weathered. No direction of opening can be determined, but the length of logs and present disposition suggest a living space on the order of 2.5 m. in diameter by 1.5 m. high.

### Chronology

The absence of historic-period artifacts defines the chronology of the site in general terms as "pre-contact." To better define the age of the structures, cores were taken from pinyon and juniper trees located on and off of the site. Sampling included: the largest tree in the vicinity, a dead, but standing pinyon; the largest pinyon tree within the cleared area of the site; four juniper trees now associated with structures; and small juniper trees within the cleared area around the structures. A full cross section from one juniper tree was retrieved to aid the detection of false rings.

The goal in retrieving the cores was not to conduct dendrochronology. A precise chronology does not exist for eastern Nevada pinyon, the few pinyon logs used in the structures were already dead and dried prior to use, and juniper is not amenable to dendrochronological analysis due to erratic growth habits. Nevertheless, juniper trees do add yearly rings and it was thought that counts of rings from a variety of trees, used in conjunction with expectations concerning the presence and absence of the trees during site use may be informative. The cores were taken from the trunks of trees, 25-35 cm. above the ground. They were sanded and observed in dampened and dry states under a binocular microscope

using 18X-28X magnification. Each sample was counted four times and suspected false rings compared to the full cross section. The final counts represent a use of conservative criteria and may err on the young side. The results are shown in Table 1 and indicate the structures may have been constructed as early as A.D. 1700, but probably after A.D. 1750. They may have been used as late as A.D. 1826, but had probably fallen into disuse earlier than A.D. 1800.

The dating of initial construction hinges on whether the tree (sample 4) in Structure 4 was present as a small tree or not present at all when the logs were placed there. The tree is nearly centered in the structure and its growth has been vertical, lifting the logs apart as it grew. This, and the unusual arrangement of logs in Structure 4 suggests that the tree may have been present and that Structure 4 may not have been a habitation. If the tree was present, the height of Structure 4 suggests that the tree would have been 50 or more years of age when the logs were placed there. Thus, Structure 4 could be as old as A.D. 1700, but in light of the other, albeit inconclusive evidence, it may have been erected after A.D. 1750. Occupation of the site during the late 1700s is also supported by the age of A.D. 1796 (sample 1) for the largest pinyon on the site, located only a few meters from Structures 2 and 3. This is based on the assumption that this tree would have been very small until well into the nineteenth century and either not likely to have been present during occupation, or unlikely to have survived human occupation.

The terminal dates of site use are based on the juniper trees in Structures 2, 3, and 4 (samples 2, 3, 5), trees almost certainly not present during construction or use. Given their ages, they would have been far too small to incorporate into structures made of large logs. For these trees to have been large

Table 1  
TREE CORE SAMPLES

Sample No.	Age	Tree Type	Location	Interpretation/Comments
1	A.D. 1796	Pinyon	On site near structures.	Large tree (30 cm. diameter), probably not present during occupation. May indicate terminal date for site.
2	A.D. 1826	Juniper	Within Structure 2.	Not present during site use. Indicates maximum terminal date for structure.
3	A.D. 1851	Juniper	Within Structure 3.	Not present during site use.
4	A.D. 1700	Juniper	Within Structure 4.	Date approximate and may be younger. Tree may have been present, ca. 50 years old, upon erection of structure.
5	A.D. 1876	Juniper	Within Structure 4.	Not present during site use.
6	A.D. 1856	Juniper	Regrowth on site.	Small juniper used for complete cross section.
7	A.D. 1936	Juniper	Regrowth on site.	Small juniper (8 cm. diameter x 2 m. tall) used to estimate age of trees this size.
8	A.D. 1626	Pinyon	Off site.	Largest pinyon tree in drainage (53 cm. diameter). Dead, standing snag.

enough to be spared for incorporation into a structure (at least 50 years old), the structures would have to date to the very late nineteenth or early twentieth centuries, which seems too late considering the absence of metal tools and historic artifacts. Assuming the trees began growing immediately after abandonment, Structure 2 (sample 2) could have been used as late as A.D. 1826 and Structure 3 (sample 3) could have been used until A.D. 1851. However, it is likely that trees did not begin growing immediately upon abandonment, and the age of sample 1 of A.D. 1796 does suggest an earlier abandonment. Thus, the age of A.D. 1826 (and conceivably, but improbably A.D. 1851) may serve as the minimum age of the site, but it seems likely that the structures fell into disuse during the late 1700s.

Samples 6 and 7 show that regrowth commenced at various times since the occupation, a process continuing today, judging from the presence of seedlings within the relatively open area of logging around the site.

A radiocarbon sample of pinyon charcoal from the excavated hearth area between Structures 2 and 3 yielded a  $^{14}\text{C}$  age of  $110 \pm 60$  B.P. (Beta-18767). This date

corresponds with two calibrated ages due to rapid fluctuations in past atmospheric  $^{14}\text{C}$  during that time. The two 95% confidence intervals are A.D. 1672-1755 and A.D. 1799-1947 (Stuiver and Pearson 1986). The earlier interval is quite consistent with the eighteenth-century estimate from the core samples, especially considering that the wood charcoal dated was dead, dried, snap-fractured pinyon used for firewood. However, given the vagaries of dating this site, the later range should probably not be completely ruled out.

#### Aboriginal Logging Techniques

The residents of the Bustos site expended considerable effort to cut the 61 sizable logs observed in these rather small structures with only exterior hearths. The builders appear to have begun logging at the point where they wanted to build, working outward and nearly clear-cutting a small area. They strongly favored juniper, which dominates the area of structures today. Pinyon is more common upslope from the site. The few pinyon found in the structures had snap fractures revealing the use of dead pinyon, although these appear to be the only dead wood used for construction. Figure 6 depicts the results of a survey of

stump remnants around the site, illustrating the zone of logging. While 61 logs were observed in the Bustos wickiups, a total of 124 stumps were counted in three 50 m. wide, concentric sampling strata around the site. Aboriginally cut stumps were found occasionally throughout the drainage. The disparity between the number of logs found in the Bustos structures and the number of stumps present suggests that other structures may have been present in the area and some inconclusive evidence for this was found during the survey of the drainage (Fig. 6). Steward (1941:233) commented, "The lack of implements for chopping or splitting wood required the use of dead timbers in construction." This obviously was not the case at the Bustos site and raises the question of why and how the inhabitants cut these trees.

The logs found in the Bustos structures had been laterally burned. Lateral burning on structural timbers has been reported (Pippin 1986:91-92), but the Bustos logs also exhibited scalloped chopping marks on the roots, trunks, or on both. Adding to the mystery, several of the larger logs had been cut by the roots, only to be returned to the site to have the bulky root ends chopped off to form a clean butt. Ten of these "stump trimmings" were found on site (Fig. 4). Close inspection of timbers failed to locate a single mark made by a metal ax or a saw. During the survey of the drainage, a partially cut, but still standing juniper snag was found 300 m. west of the structures (Figs. 3 and 6). A battered, hand-held stone ax, consisting of naturally beveled rhyolite was found 30 cm. away from the snag. Logging had proceeded by setting fire to the entire tree to remove leaves and branches while charring the trunk. The ax had been used to chop at the charred wood, probably followed by more fire, and more chopping. This tree, like many found in the structures, had been chopped at both the trunk and the roots. The

roots had been excavated, fires built under them, and two had been chopped completely through before the tree and ax were abandoned.

Several scenarios can be offered to explain the labor-intensive logging at the Bustos site. The pinyon-juniper forest around the site shows signs of long maturity, with virtually no understory. A number of very large, dead pinyon snags were observed, one significantly exceeding 350 years in age, based on coring. A forest this age now would have reached peak pine nut productivity by the mid-eighteenth century, the hypothesized time of site occupation, since maximum production is reached between 75 and 100 years of forest age (Lanner 1983). Maturing pinyon forests often contain little downed wood, requiring logs to be cut. Or, perhaps the area had been an attraction long enough that the existing dead wood supply had become exhausted, leaving good pine nut collecting, but only sizable live trees for construction. Another possibility is the preference for the harder-to-fell juniper logs over the softer pinyon could reflect an intent to construct more durable houses. Or, it may indicate an ethical response based on reverence for the pine nut resource, reminiscent of John Muir's remark that on occasion white men had been killed by angry Indians for felling pinyon pine trees (Muir 1894 in Lanner 1981:79).

Any of the above could shape the character of logging, but the investment of labor in structures lacking interior hearths or exhibiting the house pits and larger sizes characteristic of winter houses argues for recurrent occupation. Thus, this site likely represents "planning depth" (Binford 1987), a place that may not have been used every year, or used for very long at any one time, but one where the investment in structures foreshadowed an expectation to return. This inference is significant to the overall interpretation of the

occupation and will be examined later in light of other data.

### Excavations

An exploratory trench 1 m. wide by 16.5 m. long (Fig. 4), was excavated northward to assess site stratigraphy and provide a sub-surface transect across the area of structures. Then, Structure 3 was dismantled and a 4.5 x 5 m. area within and around it was excavated. Lastly, the hearth area located between Structures 2 and 3 was excavated. All sediments were screened using 3.8-mm. mesh (1/8-in.).

Site stratigraphy consists of a substratum of decomposing limestone bedrock, overlain by a single stratum of light gray to light brown, coarse sandy loam containing numerous pea gravels and angular cobbles. The stratum varies from 13 to 30 cm. thick, with finer sediments near the top, becoming coarser downward.

The area excavated around Structure 3 exhibited the same stratigraphy with no floor depression, no floor preparation, and no distinct features. The area was covered with 1-10 cm. of juniper duff and woodrat debris. Below this, excavation extended from 5 to 35 cm. deep to a layer of decomposing limestone. However, cobbles of decomposing limestone were common throughout the excavated sediments and this probably inhibited the formation of a depression from use. Perhaps finer sediments or duff were present on the surface during habitation, or mats may have been used inside the structure. Mats made of juniper bark have been found at wickiup sites in Utah and Colorado. Scattered charcoal, presumably from the burned logs used in the structure, was common. Two hearth areas marked by charcoal, ash, burned sediment, and flagstones were observed 3-4 m. north of the structure (Fig. 4). These were not excavated because excavation of the hearth area between Structures 2 and 3 would enable

examination of a well defined area between two structures.

The excavation in the hearth area (Fig. 4), marked on the surface by charcoal, ash, and small burned and fire-cracked flagstones, revealed the presence of six hearths and roasting pits occurring in three distinct, but closely spaced groups 1-3 m. from the opening to Structure 2. The fill of each was retrieved in total for macrofossil processing. Multiple superposition demonstrates the hearth area had been used repeatedly with evidence for hiatuses between uses.

Group A (Fig. 4) consisted of two small roasting pits (27 cm. diameter x 22 cm. deep; 32 cm. diameter x 13 cm. deep) lined with small flagstones. A shallow ash-lined hearth (40 cm. diameter x 7 cm. deep) was superimposed upon one of the two roasting pits. A layer of white ash and a mound of sediment rich in charcoal covered all three features. Group B included two hearths covered by burned flagstones. One was a weakly defined ashy depression (25 cm. diameter x 5 cm. deep) and the other contained a single flagstone along its wall with its bottom defined by charcoal-stained bedrock (29 cm. diameter x 12 cm. deep). Group C consisted of one pit feature that had been used initially as a large hearth, abandoned, and later modified for use as a small roasting pit. The initial hearth measured 95 cm. in diameter by 17 cm. deep below level of origin. It had been chipped into bedrock leaving a shallow, burned depression. The subsequent roasting pit, lined with flagstones, had a higher level of origin demonstrating a hiatus, but was centered over and intrusive into the earlier hearth. The roasting pit measured 45 cm. in diameter by 17 cm. deep. This feature was overlain by 8 cm. of pinyon pine duff mixed with charcoal chunks.

The duff and charcoal over the hearths, overlain by burned flagstones indicates that some activity took place at the site after trees

grew near Structure 2, or that live branches were transported to the hearth area and left there. The flagstones could represent food roasting (pine nuts?), but also conceivably could result from other behaviors such as the use of rocks heated in the fire for warmth while sleeping, or as heat reflectors. Or, less likely, they could represent use of a structure for a sweat lodge.

The analysis of hearth contents for macrofossils revealed a notable absence of seed material other than from pinyon and juniper. Most of the hearth contents had been completely burned, inhibiting identification, but of the identifiable remains, carbonized juniper twigs and berries, along with carbonized pinyon branches, twigs, needles, and cone parts, dominated the samples. A small number of carbonized fragments of pinyon nut hulls suggests fall occupation.

### Artifacts

The artifact collection from the site is dominated by lithic material. Temporal diagnostics are limited to 30 pieces of late prehistoric brownware ceramics and a single Rosegate projectile point. Two slab metates were found, but no manos and no fragments of either. Artifacts observed on the site surface are plotted on Figure 4. Table 2 lists counts of artifacts from the site surface and those found during the excavations.

Minor drainages on the site and in the vicinity yield naturally occurring nodules of chert ranging from pea- to cobble-size. Most chunks are angular, exhibit internal weathering, and, while the material is workable, it is poor quality tool stone. Many of these show very little working, but the presence of 72 primary flakes, most of them from the raw material on site, shows that some lithic reduction was attempted. However, most of these primary flakes are nothing more than angular chunks spalled from the larger nod-

ules and hardly represent the kind of lithic reduction common to the Great Basin. Use of the nodules as convenient hammerstones explains the debris better than lithic tool manufacture. These observations are important to an interpretation of the artifact densities at the site.

Table 2 shows the on-site density of artifacts to be quite low at 0.1 item per square meter. If the categories including raw material/cores and the chunks labeled primary flakes are excluded from the count, the density of artifacts falls to only 0.05 items per square meter. If we were to remove the ceramics to simulate an aceramic, "Archaic" situation with perishable structures, the density falls even lower. At any of these densities, it would be difficult to define the existence of a site had the structures not been present.

The artifact density in the excavated areas is higher at 1 item per square meter, although a similar exclusion of the categories raw material/cores and primary flakes decreases it to only 0.5 per square meter. In the area of Structure 3, the only discernable pattern was that most of the 21 nodules of raw material and crude cores were found near the rear, or southern, edge of the structure. The 16 artifacts from the exploratory trench were scattered throughout its length and most came from the upper 5 cm., although a few flakes were found at depths of up to 15 cm.

Ten bones were found, all except three from small mammals, and all but one came from woodrat deposits in Structure 3. The single burned specimen, found in a hearth, is from an unidentified small mammal.

### Additional Sites in the Drainage

Survey of the drainage containing the Bustos structures located eight additional sites and 20 isolated metates, lithic tools, and ceramic sherds. Figure 6 shows the distribu-



Table 2  
BUSTOS SITE ARTIFACTS

Location	Raw Material/ Cores	Primary Flakes	Secondary Flakes	Other Debitage	Tools	Total
Exploratory Trench	4	1	3	7	1 biface	16
Structure 3 Interior	6	2	0	1	1 backed blade	10
Structure 3 Vicinity	15	2	3	0	1 utilized blade	21
Hearth Area	0	1 (burned)	0	1	0	2
Site Surface	19	72	64	0	30 ceramic sherds, 2 metates, 9 utilized flakes	196
<b>Grand Total</b>						<b>245</b>

tion and Table 3 lists the sites, which fall into two basic categories, circular stone rings and lithic scatters.

The stone rings consist of angular-to-rounded stones (10-35 cm. diameter), arranged one to two courses high, with an inside diameter of 2-3.5 m. The line of rocks is typically very distinct on the inside of the circle, with the surrounding, outside rocks scattered, forming a less distinct circle from 3.8 to 6 m. in diameter (Fig. 7). The rings are located where bedrock appears at the surface, or where sediments are shallow, such as along ridge crests, similar to other Great Basin cases (e.g., Vierra 1986:111-130). Associated artifacts were uncommon with four rings yielding single flakes.

Half of one ring (26WP1745, Fig. 6) was excavated. The internal fill was only 3-5 cm. deep and consisted of medium to coarse sands with pea gravels. Unburned organic debris including pine nut hulls, juniper seeds, twigs, bark, etc., were present throughout the fill. Macrofossil samples from within the ring and from a test excavation in natural sediments outside yielded similar results with the exception of some immature pine nut hulls and a cone fragment from within the ring showing some signs of heating. Small amounts of charcoal, charred juniper seeds, and bark were found also, but all of the above could have been naturally introduced. The fill of the ring was underlain by closely spaced angular bed-

rock (Fig. 7), identical to the test excavation outside the ring. A single chert flake was found adjacent to the ring.

These features most likely are the remains of pine nut storage facilities. They are all located in a mature pinyon forest, and the practice of locating them near bedrock would inhibit rodent invasion. Various methods of storing pine nuts have been documented (e.g., Madsen 1986:31-32) including one in which the nuts or cones are piled within a circle of stones, then covered with branches and earth (Hoffman 1878:473). Davis (1965:12), Wilson (1974), and Lanner (1981) identified the processing and storage of unopened, green cones. This practice would leave few macrofossils at the point of storage since the cones/nuts would not have been roasted. While feasible, this practice suggests relatively short-term storage of perhaps a few months at the most.

The manner of storage is attested by the diffuse pattern of rocks loosely defining the outer dimensions of the rings. They show the stored contents had been retrieved by first removing stones that had been piled on top of the entire mass, throwing or rolling them outward, followed by removal of the branches and earth to reach the stored nuts. The process would leave a characteristic contrast between the crisp inner and diffuse outer line of ring demarcation. Other functions of Great Basin rock rings are known, including

habitation (e.g., Bettinger 1976, 1989; Thomas 1988), but Vierra (1986:118) found that the ratio of inside to outside ring diameters may correlate with ring function. Ratios less than 0.5, a reflection of thicker walls, indicate storage (Vierra 1986:118). All of the rings reported here exhibit ratios less than 0.5 with the exception of the excavated ring, which was also determined to have been used for storage (Table 3). Thus, these measurements and the pattern they reflect may serve as a rule of thumb in archaeological reconnaissance, useful for differentiating between pine nut storage rings and house rings. The latter should have a crisply defined line of rocks on both the inner and outer margins of the ring and ratios of inside to outside diameters greater than 0.5.

A distinct spatial patterning in site distribution was observed, with the stone rings located on ridges, all but one (26WP1750) west of the Bustos site. The lithic scatters are all located east of the structures, down the ridge (Fig. 6). Less than ten lithic artifacts were observed upslope, in the vicinity of the stone rings, although ceramics and grinding implements (metates and a cylindrical mano/pestle), often co-occurring, were observed there. Immediately surrounding and extending down the ridge from the Bustos structures, site 26WP1743 included 11 lithic scatters, five metates or fragments, and occasional cut timbers. Those lithic concentrations located along the south face of the ridge were small, consisted of the same poor-quality raw tool stone seen among the structures, and showed



Fig. 7. Partially excavated stone ring, 26WP1745.

Table 3  
ADDITIONAL SITES IN DRAINAGE

Number	Site Type	Artifacts	Characteristics/Interpretation
26WP1743	Lithic scatters	2,000+ lithics; 5 metates and fragments	Eleven lithic concentrations of two types: raw material sources; final reduction/retooling workshops. Isolated artifacts and three loci of human-felled logs observed.
26WP1744	Stone ring	1 flake	Interior 2.1 m. diameter; Inside/outside ratio = .4; Pine nut storage facility.
26WP1745	Stone ring	1 biface tip	Interior 3.4 m. diameter; Inside/outside ratio = .6; Excavated pine nut storage facility.
26WP1746	Stone ring	1 flake	Interior 2.4 m. diameter; Inside/outside ratio = .5; Pine nut storage facility.
26WP1747	Stone ring	1 flake; 47 sherds	Interior 2.5 m. diameter; Inside/outside ratio = .4; Pine nut storage facility. (Pot drop 30 m. away)
26WP1748	Stone ring	None	Interior 2.4 m. diameter; Inside/outside ratio = .5; Pine nut storage facility.
26WP1749	Stone ring	None	Interior 2.5 m. diameter; Inside/outside ratio = .4; Pine nut storage facility.
26WP1750	Stone ring	None	Interior 2.2 m. diameter; Inside/outside ratio = .5; Pine nut storage facility.

some evidence of initial reduction. Others located along the ridge top, north of the structures, were large, often with very high densities of secondary and tertiary reduction flakes (some exceeding 50 items per square meter), and contained raw material not found in the drainage. These areas appeared to be workshops for secondary and final reduction. Finished, unbroken tools were rare as would be expected in tool-making workshops.

All eight projectile points found away from the Bustos structures were from 26WP1743, including two Elko Corner-notched, four Rosegate, one Cottonwood Triangular, and one Desert Side-notched. Neither the Rosegate nor Elko points are consistent with the age of the structures. Most evidence suggests that Rosegate points terminate by A.D. 1300 in the western and central Great Basin (Thomas 1981) and by A.D. 900-1000 in the extreme eastern Great Basin and Colorado Plateau (Holmer 1986). However, dates as recent as the fourteenth and eighteenth centuries for this series are known from the Great Basin (Wilde 1985:143, 147). Elko Corner-notched terminate by A.D. 700, but

isolated cases of their later use is also acknowledged (Thomas 1981:32). Thus, as is always the case with small samples of points from individual sites, they only suggest chronology rather than confirm it.

Three loci of structural timbers were also observed at 26WP1743 (Fig. 6). One at the eastern tip of the ridge consisted of a vertical pinyon post and nearby fallen juniper logs. All had been cut with a metal ax, and hence must post-date the Bustos structures. North-east of the structures was a single juniper log cut with fire and a stone ax, leaning butt end up against a live juniper tree. The most apparent arrangement was located south of the structures and consisted of a depression partially ringed by seven juniper logs cut by fire and a stone ax. Three of the logs partially overlaid each other in a cribbed fashion. Two stone flakes were the only artifacts observed.

#### An Interpretation of the Bustos Site

The juxtaposition between structures of substantial investment and the absence of nearby occupational debris suggests short-

term visits, in a season other than winter, at a place fostering a high degree of planning depth—that is, a place expected to be visited repeatedly over the years. The small size of the structures, absence of interior hearths, nearby hearths outside, and doorways opening from the north through east are features consistent with ethnographic accounts. These accounts do, however, attest to a high degree of variability in house type and application (e.g., Steward 1941:232-233, 282-284, 1943:272-273, 305-306; Stewart 1941:377-378). The interpretation of recurrent but intermittent use is supported by the modification, superposition, and hiatuses between uses seen in the hearths. Charred pine nut hulls in the hearths, although few, indicate the site was used in the fall. The low density of debris not only implies short occupations, but suggests that a limited range of activities took place when the site was occupied. The absence in the hearths of macrofossils other than those from pinyon and juniper trees, while inconclusive, is consistent with this interpretation.

If the Bustos site were contemporaneous with the stone rings and lithic scatters in the drainage, the interpretation would be enhanced. These sites indicate pine nut collecting, pine nut storage for eventual use elsewhere, and final stone tool manufacture and possibly retooling. Some support can be garnered for a temporal association for at least some of the surrounding material, based on the temporal consistency of the ceramics and the projectile points. On the other hand, even though all the temporally diagnostic items in the drainage are of late prehistoric age, the temporal span of these items is much longer than the demonstrated life span of the structures, and hence they may not be strictly contemporaneous. Spatial patterning among the sites suggests some degree of temporal association. There are two basic kinds of sites in the drainage, stone rings and lithic scatters.

They are spatially distinct and separated from each other by the Bustos site which seems to be a focal point dividing the two kinds of sites in the drainage (Fig. 6). In fact, the background density of isolated lithic debris and of lithic concentrations increases as one approaches the Bustos structures, where the density then falls off. Although it is impossible to say that all of the features and artifacts in the locale are contemporaneous, it is probable that some of them are.

The available evidence indicates the Bustos site was a pinyon harvest camp. This interpretation also is consistent with the attributes identified by Bettinger (1979) for "temporary pine nut camps." Pine nut harvesting would not occur every year, but would be expected to recur intermittently in a mature pinyon forest. The expectation to return would justify the effort invested in the structures, which could be easily refurbished. The association of ceramics and metates with the area of stone rings is consistent with pine nutting activities. Few other activities would have taken place since pine nut harvesting would have involved all members of the household. The site could have been occupied for a maximum of a few weeks in the early fall while pine nuts were harvested and stored, but the duration of use may have been much shorter. If all seven stone rings were used during an occupation of the Bustos structures, the rings could be filled with cones in only a few days. Experiments show that over one cubic meter of cones can easily be collected by one person in an hour. Piling cones a meter deep in a stone ring 2.5 m. in size would enable 5 m.<sup>3</sup> of cones to be stored in such a facility—only 5 hours of collecting by one person. If, for the sake of discussion, the Bustos structures were occupied by 10 people, all seven stone rings could be filled in less than 40 person/hours of cone collecting. Thus, even using these conservative figures and allowing for cone roast-

ing, transport from the trees to the stone rings, and closure of the storage unit, the site may only have been used less than one week per collecting year. Ethnographic records show that the preferred place of storage was near the grove of harvest (Egan 1917:241; Madsen 1986), with the problem of transport typically solved later. Perhaps the nuts were only cached for a short period and used by passers-by, or they may have been cached for retrieval later in the season to a winter camp located elsewhere. At any rate, occupational hiatuses in excess of a single year should be expected since pinyon groves produce nuts erratically, with a cone-crop frequency of one to two years and some years of zero production (Lanner 1981:76-81, 1983; Sutton 1984; Madsen 1986).

Finally, available evidence does not preclude other uses of the area. Reuse is indicated by the virtual absence of manos in the drainage. They probably were scavenged (Simms 1983), leaving the numerous metates observed. However, the uniformity among hearth contents suggests consistency in site function and the predominance of fall occupation. Thus, the site probably was not occupied for long during any visit, debris producing activities were not typically conducted at the structures themselves, and other potential uses have not significantly altered the site characteristics.

#### THE BUSTOS CASE AND ISSUES OF SITE STRUCTURE

The Bustos site is characterized by the presence of relatively few nonperishable artifacts, yet the structures represent substantial investments of time and energy. With the on-site artifact density at only 0.1 item per square meter, and lithic scatters containing up to 2,000 flakes only 200 m. away, if the structures had perished, it is unlikely that the place of residence would have been recorded at all.

If the hearth areas had been spotted, and a standard 1 m. x 1 m. test excavation had, for instance, been placed over them, such a small test would have failed to identify the structures located a few meters away. Writing about a historic period conical lodge in south-central Nevada, Pippin (1986:92) observed,

If one were to remove all evidence of wood at this site, little would remain to demonstrate the existence of a lodge . . . except for the presence of the millingstone and two pottery sherds, its associated artifact assemblage would be indistinguishable from the general scattering of artifacts throughout the area.

Reno and Henton (1988) echoed similar sentiments. Stepping further into prehistory, this set of circumstances is conceivably present at countless sites in the world. Pippin (personal communication 1989) makes the observation that artifact density at temporary camps with structures or suspected structures is low, but assemblage diversity is relatively high. This contrasts with the pattern of low assemblage diversity occurring as a function of small sample sizes typical of offsite situations (Jones et al. 1983). Pippin sees the opposite relationship with high assemblage diversity occurring in very small, diffuse samples. The Bustos case supports this. As one moves away from the area of structures, assemblage diversity decreases while sample size increases. This distinction may offer another means of distinguishing temporary camps with long-perished residences.

Through comparisons between propositions from ethnoarchaeology, the Bustos case, additional cases of temporary camps in the Basin-Plateau region, and a slightly different set of cases in the form of tipi rings on the Plains, perhaps the recognition of temporary camps can be further improved and the range of interpretation for them broadened. For the discussion here, the term wickiup is used as a generic term for small, light structures used by hunter-gatherers, acknowledging this

includes a range of structural types including conical lodges, domed "wickiups," lean-tos, and windbreaks. Three questions are considered. (1) What variables could account for the relationships between artifacts and structures at the Bustos site? (2) How does the Bustos case compare to other sites with hunter-gatherer structures in light of these variables? (3) What are the implications for the interpretation of site function, strategies of site recording, the planning of test excavations, assessments of site significance, and the use of negative evidence (i.e., the absence of structures and artifacts in the immediate vicinity)?

### **Behavioral Situations and Material Remains**

Ethnoarchaeology suggests two kinds of situations in which few artifacts should be present near small structures used by hunter-gatherers: (1) short-term occupations which leave little refuse; and (2) long-term occupations leading to secondary disposal, thus removing refuse from the immediate vicinity of the habitations (e.g., Yellen 1977; Binford 1978; Murray 1980; O'Connell 1987; Simms 1988; Fisher and Strickland 1989). In short-term, fair weather camps, few activities other than sleeping take place within shelters, leaving little or no debris (Yellen 1977:92; O'Connell 1987). When debris is found near structures, it often is associated with hearths (Yellen 1977:90-91; Binford 1978; O'Connell 1987; Fisher and Strickland 1989). Another feature of short-term camps, and especially pertinent to pine nut harvesting, is that the activities shaping the location of occupation may have little direct physical association with structures used for residence, thus few artifacts would be present at the habitation site. Tools present at such habitations should be domestic types not amenable to transport, having been cached or simply left behind.

As duration of occupation increases, ar-

tifact density should rise until the occupation is long enough to require secondary disposal. This implies a continuum beginning with few artifacts for the shortest occupations, increasing artifact density even though occupations may still be relatively brief, and finally a decrease in density in and around structures at sites resulting from long-term occupation with secondary disposal. Secondary deposits at sites used for longer periods should exhibit size sorting, with only small debris at structures (possibly visible only as microrefuse; see Hull [1987] and Metcalfe and Heath [n.d.]). Refuse areas should contain worn-out and broken items. More small, portable, but unbroken tools should be present since the temporal window of loss would increase with longer occupations. Great Basin cases exhibiting some of these characteristics have been described, including the Vista site, a winter camp in western Nevada (Zeier 1986), and the Orbit Inn, a late prehistoric residential base in northern Utah (Simms and Heath n.d.).

A consideration of site structure purely as a function of duration of occupation places the Bustos site in the category of short-term occupation. However, studies show there is more to site structure than duration of occupation, with site function also being important. While many sites with evidence for light structures do seem to yield few nonperishable artifacts at the structures, the contrary situation is conceivable in that some short-term sites may in fact be a function of activities carried out at the habitations themselves, increasing the frequency of artifacts there. Examples include wickiups or windbreaks erected in high-density food-producing areas such as dunes (often concentrated islands of biomass relative to surrounding communities) or highly productive marshes where processing may take place at the residence; a camp located adjacent to a stream from which fish are

taken and processed; and structures erected near lithic procurement areas where primary tool reduction was conducted. These might all be situations of short-term use where debris could be closely associated with temporary structures.

Another variable shaping the relationship between artifact debris and habitations in short-term camps is seasonality, producing the expectation of increased activity directed to requirements for shelter during colder weather.

Finally, reoccupation of sites, creating palimpsests, is widely recognized as affecting site structure. The effects of reoccupation on the interpretive potential of sites must be routinely considered.

By identifying these variables and possible material consequences, the Bustos site is significant not because it shows that short-term camps should always yield few artifacts in close relationship to structures—they do not. Rather, it suggests that aspects of the behaviors which produce distinctions among sites may be ascertainable by comparing the above-described expectations for the material record with data from sites with light, portable, or otherwise perishable structures.

### Comparison to Other Sites

Relative to other site types, wickiups and other temporary, lightly constructed structures such as lean-tos, windbreaks, etc., have been considered rare in the Great Basin; hence, they have been treated as individual and unique cases. However, as with many issues of site recognition in archaeology, the more attuned archaeologists become toward certain classes of data, the more is found—and publications or CRM technical reports describing Great Basin wickiup sites have steadily accumulated (e.g., Tuohy 1969; Ambro 1972; Ambro and Wallof 1972; Bettinger 1975, 1976, 1989; Ritter 1980; Pippin

1986; Arkush 1987). Hundreds of additional wickiup sites are known, especially from Colorado (Shippee 1971; Davis 1975; Scott 1988; Terry and Gilchrist 1988), but most documentation exists as site forms. This study does not attempt to report on all known wickiup sites, but rather point to a dilemma that seems to exist in much of the Basin-Plateau region concerning what to do with such sites. Recording has been sporadic and guided by issues of "cultural affiliation." This has led to a focus on finished tools with little mention of debris in general. Many site forms lack even the most basic map. When artifact density distributions are documented, this is typically limited to those in, or immediately around structures with no mention of the surrounding spatial context.

Some parallels are evident in the case of tipi ring sites on the High Plains. Literally thousands of tipi rings have been recorded and discussed for decades although opinion has varied as to what such sites mean and how to approach them. The study of tipi rings has often been disparaged, seen as an uninteresting class of sites yielding few artifacts and features (Mulloy 1954:54; Kehoe 1960; Frison 1967, 1978:53). The perceived paucity of artifacts has led to the view that sites with evidence for light or portable structures are uninformative relative to the information produced at other kinds of sites (see Davis 1983a; Deaver 1983:70). This perception is noteworthy in light of the Bustos case. Perhaps it is no wonder that archaeologists have a hard time locating anything but substantial hunter-gatherer habitation structures (i.e., pithouses or houses with stone foundations), even though light, temporary wickiup and tipi structures (again used as generic terms) probably represent the bulk of hunter-gatherer residence during the prehistory of the continent.

While variable in quality and focus of

recording, data on wickiup and tipi ring sites do have implications in light of the variables identified above which shape the relationship between artifacts and temporary habitation structures. These four variables (duration of occupation, site function, seasonality, and reoccupation) are used here to organize the discussion of these data. Tipi ring and some Great Basin house data can be referred to via published reports. The site records for mapped wickiup sites in Colorado, Nevada, and Utah have been examined from several hundred such recorded sites. Qualitative information from published reports and this search is incorporated into the discussion below. The attributes of 27 selected sites representing between 88 and 104 structures with data directly relevant to this study are shown in Table 4.<sup>1</sup> Finally, the variables discussed below are recognized as systemic, with individual situations likely a result of interaction among them.

**Duration of Occupation.** An understanding of the duration of occupation of tipi rings has been clouded by the assumption that large sites with many rings imply villages of long occupation. I suggest this mentality has been employed in the Great Basin as well. However, there seems to be little relationship between numbers of tipi rings and the density of artifacts in and around the rings. Preliminary data suggest that the quantity of nearby artifacts is in part a function of duration of occupation. Loendorf and Weston (1983) found that regardless of site size, tipi rings in unprotected locations along known trails or travel routes yield few artifacts (0 to 10 items for the entire site). Sites in protected locations, on trails or in other settings yield more debris. They suggest that sites along trails are left by people enroute and that sites of longer occupation occur in more protected locations. Kehoe's Blackfeet informants iden-

Others working with tipi rings also see a relationship between artifact densities and duration of occupation (e.g., Reher 1983:). It must be kept in mind however, that ethnoarchaeology shows the relationship is not a simple matter of the presence or absence of debris. For the absence of debris to imply very short-term occupation, the absence of secondary disposal and possible size of site must also be demonstrated, lest the paucity of debris result from a longer-term occupation with debris having been removed from the immediate area of residence.

As for wickiup sites, Table 4 shows that while most yield some artifacts in proximal structures, as did the Bustos site, the density is generally low, suggesting short-term use. In contrast, Arkush (1987) excavated two, relatively large historic-period juniper log wickiup houses with interior hearths. He found 1,000 artifacts in one house and over 800 in another. Even accounting for the fact that most of the artifacts seem to be durable, unmanufactured debris imported to the site from the Euro-American world, the density of debris inside the structure is still high. Similar results had been reported by Bettinger (1981) for a winter house in central Nevada. Berger (1989:28-31) interprets Pinyon House, an Owens Valley gabled log structure with an interior hearth as indicative of a possible winter occupation. More artifacts were found in the structure than in most cases reported here, but there still were less than 15 items including historic debris. In light of the results reported here, perhaps Pinyon House, which is quite small at 2.5-3 m. in diameter, may actually be a more recent example of the Bustos situation. Thus, it may be more representative of "planning depth" (Birt 1987), a place invested in with the intention of return, than it is of long-term occupation during the winter. The concept of planning depth



Table 4  
 CHARACTERISTICS OF SELECTED WICKIUPS IN THE BASIN/PLATEAU REGION

Site No.	Number of Structures	Hearths	Associated Secondary Refuse	Fire-cracked Rock at Structures	Artifacts in Proximity	Density	Artifacts in Vicinity	Comments
<b>Northwest Colorado</b>								
5RB53	11-17	1	no	? 8 "artifacts"	<.03/m. <sup>2</sup>	Few	"Artifacts rare"	
5RB144	6	1 inside; 4 outside	no	"scattered"	?	Lithic items, ceramics, 30-50 cm.	Suspected reoccupation	
5RB391	1	2 outside	no	yes Recognizable tool/tool fragment; bone; ground stone	"dense"	?		
5RB418	1	0	no	? Recognizable tool/tool fragment; ceramics, few	?	120-230 m.		
5RB1805	1	1 inside; 1 outside	no	yes Recognizable tool/tool fragment; lithic items	.05/m. <sup>2</sup>	Lithic items 12 and 35 m.	Suspected reoccupation; 24 artifacts	
5RB1876	1	?	no	Lithic items (1, 10m.)	<.02/m. <sup>2</sup>	Ground stone (1) 40 m.		
5RB2149	1	1 outside	no	no Recognizable tool/tool fragment;	.09/m. <sup>2</sup>	18 artifacts		
5RB2624	20	7 inside	10 "middens"	in middens Recognizable tool/tool fragment; ground stone; ceramics (many)	?	yes few flakes near structure	Suspected reoccupation;	
<b>Nevada</b>								
26NY1025	1	not seen	no	Ceramics (2); ground stone (1); lithic items (5-10 m. away)	1/m. <sup>2</sup>	Lithic items (many)	Suspected reoccupation;	
26NY4023	4	not seen inside	no	no Ground stone (3); ceramics (1); early historic debris; lithic items (2)	<1/m. <sup>2</sup>	Lithic items	Conical timber lodge Brush windbreaks	
26NY4040	3	not seen inside; 3 outside	no	yes Ground stone (2); recognizable tool/tool fragment (1)	.1-.31/m. <sup>2</sup>	Lithic items, ceramic (1)	Brush windbreaks	
26NY4070	1	not seen	no	no Ground stone (1); ceramics (13)	.1/m. <sup>2</sup>	Lithic items (9, >5 m. away)	Brush windbreak	
26NY4124	3	not seen	no	no Ground stone (2); early historic debris (1)	.03/m. <sup>2</sup>	Lithic items (5, >8 m. away)	Brush windbreaks	
26NY4588	1	not seen	no	Lithic items (21); ground stone (1)	<1/m. <sup>2</sup>	Lithic items; ceramics; early historic debris	Brush windbreak; suspected reoccupation	
26NY4940	1	Charcoal present	no	no Early historic debris (2); recognizable tool/tool fragment (1); lithic item (1); ground stone (2)	<.5/m. <sup>2</sup>	Lithic items	Wickiup with depression	
HM0781	1	1 inside(?)	no	yes Core (1)	.1/m. <sup>2</sup>	Lithic items (3) 10 m.	4 artifacts	
CRNY3613	4-10	1 inside; 1 outside	no	yes Recognizable tool/tool fragment; lithic items	<.007/3 m. <sup>2</sup>	Lithic items, recognizable tool/ fragment	Suspected reoccupation; near antelope traps	
CRNY3619	5-7	not seen	no	yes Ceramics (2); recognizable tool/ fragment (2); lithic items (1); ground stone (1)	low	Lithic items 30 m.		
TY1482	2	not seen	no	Ceramics (5)	low	Lithic items; recognizable tool/ fragment (4); ground stone (5)	Lithics 100-150 m. away	
TY1594	4	2 outside	no	yes Recognizable tool/tool fragment (3); low early historic debris; ground stone (3)	low	Lithic items (500+) 100 m.		

(continued)

Table 4 (continued)

Site No.	Number of Structures	Hearths	Associated Secondary Refuse	Fire-cracked Rock at Structures	Artifacts in Proximity	Density	Artifacts in Vicinity	Comments
Fenenga <sup>a</sup>	2-3	2 outside	no	?	Early historic debris, recognizable recognizable tool/tool fragment	0-.1/m. <sup>2</sup>	Lithic items; ground stone	Washo pine nut camp
<b>Utah</b>								
42DC346	5	2 outside	no	yes	Recognizable tool/tool fragment; lithic items (25); bone	.01/m. <sup>2</sup>	Yes	"Very sparse artifact scatter"
42EM1698	1-2	1 inside	no	yes	Lithic items; ground stone (3)	Increases within 5 m.	Yes	Suspected reoccupation; also Archaic use
42GAS29	3	3 outside	no	?	Lithic items; ground stone	?	Yes	Depressions and chopped, burned junipers
42R112	3	Yes	?	?	Recognizable tool/tool fragment; lithic items; bone	?	?	Lean-to's
42TO563	1	0	no	no	Lithic item (1); ground stone (1)	low	Lithic items 100-150 m.	
42WS1688	1	2 "stains"	no	yes	Recognizable tool/tool fragment; lithic items (25); ground stone (2); early historic debris; ceramics (200)	?	Lithic items; ceramics; 0-20 m.	Suspected reoccupation; stone alignment

<sup>a</sup> (1975). Note: numbers in parenthesis indicate frequencies of items when reported

with structures in the Great Basin and should be considered as a facet of duration of occupation.

**Site Function.** For the study of prehistoric adaptive strategies, site function is one of the most important interpretations that can be made in archaeology, yet one of the most elusive. In the case of tipi ring studies, site function is rarely addressed, possibly because it is difficult to ascertain at such sites. However, in cases where site function is interpreted, its relationship to the presence, absence, and distribution of artifacts at small sites with structures can be suggested. For instance, at the Pilgrim site, a large, frequently reoccupied tipi ring site with numerous artifacts in and around the structures (Davis 1983b), Aaberg (1983) argued that root collecting and processing was a central activity. Rock clusters and rock-filled pits are associated with structures. Animal bone processing is ruled out because bone is rarely associated with the structures. The author suggests the site was located in proximity to a specific activity and resource, root collecting, leaving a referent at the structures themselves. At the Ross Glen site (Quigg 1983), there were thousands of lithic tools and debris in and around tipi rings, but bone preservation was poor. However, rock-filled pits located in and near structures, along with tiny calcined bone fragments, are interpreted as a product of bone grease reduction, in contrast to the Pilgrim site. The Johnson bison kill site (Deaver 1983) includes 184 tipi rings, many lithic items, the indication of cleaning, some secondary disposal, and bison kills utilizing steep bluffs adjacent to the residential site. This site indicates longer-term but repeated occupation with some activities related to butchering carried out at the place of residence.

A survey of site function in the converse situation, those cases with few artifacts in and

around the tipi rings, is hampered by an inability to determine function, especially in the absence of data on the surrounding spatial context, a problem in site recording in the Great Basin as well. However, the number of tipi ring sites with few artifacts in proximate association with structures, possibly the majority of such sites, suggests there are many circumstances of short-term use or where the activities did not take place at the residential structures.

At wickiup sites in the Basin-Plateau region, and to the extent site function can be seen in artifacts associated with the residences themselves, activities seem to be primarily oriented toward food preparation (e.g., Bettinger 1979). Turner et al. (1986) refer to sites TY1482 and TY1594 (Table 4) and note that "food processing tools," such as grinding stones and ceramics, tend to be closer to structures at wickiup sites than are chipping stations in western Nevada. This was true at the Bustos site and at some California sites (cf. Bettinger 1989), and is strongly apparent at other Nevada sites (Pippin 1986) and at other examples shown on Table 4. Table 4 also shows that fire-cracked rock is frequently associated with structures, conceivably representing various domestic activities. The Bustos case is consistent with these observations. When artifacts are found in and near structures, they tend to be finished items, in keeping with the common-sense assumption that such artifacts would be kept at "home." In several cases, finished tools found in or near the structures are broken, showing isolated events of tool repair and discard. These characteristics increase the assemblage diversity, in a context of low density and small sample size noted by Pippin (personal communication 1989) for temporary camps. These observations may offer a means of distinguishing temporary camps from the nonsite pattern where assemblage diversity is

strongly conditioned by sample size (Jones et al. 1983).

On the other hand, activities are not always recognizable at temporary structures. In the case of two wickiup sites in northeastern Nevada (Table 4, sites CRNV-11-3613, CRNV-11-3619) at least spatially associated with antelope driving fences, the debris at the structures themselves yields no indication of a functional association with hunting and processing. However, lithic concentrations found nearby, if temporally associated with the structures, could make such a link and it seems conceivable that such cases exist. In the Bustos case, the presence of pinyon macrofossils in the hearths aids the interpretation, but the argument for pine nut processing is based not on the macrofossils, rather on study of the overall site context: the cultural and ecological characteristics of the site vicinity; an argument of contemporaneity among features in the vicinity; and a consideration of the causes of artifact poverty in a context of relatively high assemblage diversity.

**Seasonality.** At first glance, a convenient measure of seasonality might be the presence of hearths inside structures, indicating use during the colder months. Ethnography shows that season plays a role in the placement of hearths at tipi sites (Kehoe 1958:867, 870) although tipi ring studies show that hearths can occur inside structures known to have been occupied in the summer (Adams 1983:13). Nevertheless, there seems to be some relationship between hearths, artifacts, seasonality, and duration of occupation (Brumley 1983). Rings with hearths contain greater numbers of artifacts in the rings and on the site in general than those without hearths. Kehoe (1983:334) commented that this means longer-term occupations during the winter, a characteristic of Plains life. A similar conjunction of variables exists at several Great Basin winter houses (e.g., Bet-

tinger 1976, 1989:32-42; Arkush 1987) where there is a higher density of debris in close association with the structures than at the sites shown on Table 4. The higher density of debris probably is a function of more activities occurring under shelter during the winter and from a longer occupation, but the potential role of planning depth may also be relevant here. Also, winter camps were not necessarily occupied all winter in many parts of the Great Basin, thus seasonality may be as significant as occupational duration in causing the higher density of debris in these cases. Winter wickiups in the Great Basin seem to have been substantial, typically shallow, pit structures from 18 cm. to over 70 cm. deep based on excavation and ethnographic data (Steward 1933; Ambro 1972; Arkush 1987). These contrast with the smaller structures at the Bustos site, and on most site forms examined. In these cases, fair-weather use is indicated by the light nature of the structures and few interior hearths (although the possibility for buried hearths at sites on Table 4 could raise these counts). In general, these sites yield few artifacts, which likely is a function of the interaction of seasonality with occupational duration and site function.

**Reoccupation.** Many of the sites examined in the course of this study appear to be palimpsests. This is a recognized issue in the study of tipi rings on the High Plains (Davis 1983b) and Table 4 shows it occurs at Great Basin wickiup sites as well. Palimpsests can be seen in short- and long-term perspectives. The creation of palimpsests over the relatively short-term life of many structures would be expected as people returned to familiar locations and refurbished them. In cases representing planning depth, this kind of reoccupation may not greatly alter the structure of the site unless a shift in site function, of a kind likely to change the material distribution of debris, occurred. However, over the temporal

scale covered by archaeology, the creation of palimpsests can be a problem. At a minimum, some recognition of this effect may be gained by attention to the relationships between behavior and expected material remains such as those discussed here. If a palimpsest significantly altering the material record is suspected, data on chronology and cultural affiliation, and attention to the larger spatial contexts of structures become even more necessary as a means of understanding the effects of reoccupation. However, as has been shown, data of this kind are not always available at such sites. In many cases, sites simply will not be amenable to precise interpretation, but only subject to limited conclusions recognizing the cumulative effects of multiple occupations.

### IMPLICATIONS

As stated before, the Bustos site holds implications at several levels. As an approximation of ethnoarchaeology in the Great Basin, the Bustos case, in comparison to other sites with perishable structures, suggests that variability in site structure may be accounted for to some degree. By thinking about such sites in terms of formation processes, information about duration of occupation, site function, seasonality, and reoccupation can at least be increased. This in turn gives meaning to field data that at first glance often seems useless. Perhaps this exercise can assist researchers in thinking about a class of relatively uncommon sites, those with perishable structures, but which may in fact be the survivors of one of the most common classes of sites in the Great Basin. Bettinger (1979) presented a taxonomic key for identifying site function using commonly found artifacts and features. The Bustos case fits his category of "temporary pinyon camp." His classification however, relies on readily apparent surface evidence of structures. This is something that

probably does not exist at many sites that nevertheless once contained structures. Since the spatial relationship between perishable structures and nonperishable debris frequently is indirect, many such sites surely go unrecognized. The density of artifacts at the Bustos site, as well as at other wickiup sites and many tipi ring sites, frequently is well below 0.1 item per square meter. In some areas, cultural resource management policy does not even allow for the recording of such situations. The remedy will not however, be found in a regulation, such as recording everything as individual sites. Rather, the decision-making about recording can be improved. For instance, the evidence presented here suggests that when lithic scatters are found in an area, and small, often scattered areas of grinding stones, ceramics, and fire-cracked rock occur in the vicinity, the possibility for the buried remains of long deteriorated structures increases. Again, a pattern of low density/high assemblage diversity contrasting with a surrounding context of low density/low diversity may be useful for identifying temporary camps too old to exhibit well-preserved structures. Test excavations larger than the CRM standard of 1 m. x 1 m., and located by flexible criteria, are warranted in such situations.

When test excavations are employed to learn about lithic scatter sites, a common practice is to locate them in the area of greatest lithic density. While this has its uses, the evidence presented here suggests that this will probably not expand knowledge of site attributes beyond recovering more of the same lithic items. Surely in many situations it will not be clear where else to test. Nevertheless, limiting our attention to the most obvious remains, with consequent interpretation based on such data, can be misleading. Most archaeologists have seen countless cases of lithic scatters interpreted as

"hunting camps," or closely related characterizations. Such interpretations are not based so much on the presence of lithic items as they are upon the negative evidence: the absence of other site attributes. As shown here, "other site attributes" are likely to be difficult, but not impossible to recognize in cases of short-term occupation by hunter-gatherers employing lightly constructed shelters, yet this conceivably is a very common site type. The implications for the interpretation of Great Basin prehistory, especially changing subsistence regimes, are broad. For instance, with increasing time depth, habitations become more difficult to detect. How is our view of a hunting oriented Archaic period in the Great Basin (in contrast to later times) affected by the preponderance of Archaic lithic scatters with few additional recognized site attributes? The problem seems obvious.

A central message of this study has been that, at these kinds of sites, general site context is extremely relevant to interpretation, even acknowledging the constant problem of determining contemporaneity among loci of debris. As Great Basin archaeologists record more sites with perishable/portable structures, or sites where structures are not immediately evident, but suspicions are raised, perhaps we can go beyond the "interpretation by default" often produced by a preoccupation with lithic scatter archaeology.

#### NOTE

1. Table 4 is by no means exhaustive, and is biased toward unpublished sites, or those in the CRM literature. A search for comparative sites began in 1986 with a presentation at the Great Basin Anthropological Conference, Las Vegas, followed by computer record searches, calls for assistance printed in newsletters, and inquiries to federal agencies. Of the literally hundreds of sites with suspected or known light structures, few have site maps, and the vast majority have not been recorded in a manner amenable to research which requires knowledge of spatial relationships between habi-

tations and debris.

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