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**Momentum: Recent
Research into the
Archaeology of the
Perry Mesa Region**

Will G. Russell
guest editor

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THEMED ISSUE:

MOMENTUM: RECENT RESEARCH INTO THE ARCHAEOLOGY OF THE PERRY MESA REGION

PREFACE

Will G. Russell, Guest Editor

If you're heading from Phoenix to Flagstaff and find yourself stuck behind an 18-wheeler north of Black Canyon City, you can blame Black Mesa, a thin volcanic plateau east of the Bradshaw Mountains. Once topside, look to the east, across the Agua Fria River, and you'll see Perry Mesa, perhaps the best kept secret in Southwestern archaeology.

To one degree or another, archaeologists have been interested in this landscape for over a century. Given Perry Mesa's location, pinched between well-defined cultural traditions to the north and south, this attention has ebbed and flowed in tandem with theoretical interest in social boundaries and frontier zones.

The last 16 years have seen a dramatic increase in archaeological interest on and around Perry Mesa (e.g., Abbott and Spielmann 2014; Wilcox and Holmlund 2007; Wilcox et al. 2001a, 2001b). In 2011, the Cultural Resources Committee of the Friends of the Agua Fria National Monument (FAFNM) planned and hosted the first-ever Perry Mesa Symposium, dedicated to the region's archaeology and history. Spearheaded by Mike Hoogendyk, the conference was sponsored by Tonto National Forest, the U.S. Bureau of Land Management, Arizona Game and Fish, and Arizona State University. It was held in Phoenix, on the easily-remembered date of 9/10/11. By all accounts, the event was a smashing success, and Hoogendyk went on to edit the published proceedings (Russell and Hoogendyk 2012). The conference also inspired this issue of the *Journal of Arizona Archaeology*, and each of the authors in this issue were conference participants. The issue adds to a growing body of research into one of the most diverse, promising, and profitable opportunities for the study of ancient Southwestern societies. Although my own work no longer takes me onto Perry Mesa, I will always feel a connection to the place, drawn to its promise of discovery. Someday again, maybe, I will stand on its rocky edge at twilight, breath the chilled air pushed up from below, and smile at the thought of what the next day may bring.

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ASSESSING THE VERDE CONFEDERACY DEPLOYMENT TO PERRY MESA WITH CHEMICAL ANALYSES OF PHYLLITE-TEMPERED POTTERY

David R. Abbott
Andrew D. Lack

ABSTRACT

The Verde Confederacy model of prehistoric warfare and alliance has substantially influenced recent archaeological research in central Arizona. In this paper, we evaluate one aspect of the model, which posits a strategic relocation of populations from the Pueblo III hilltop settlements to defensively oriented settlements atop Perry Mesa around A.D. 1275. Such a migration must have entailed well-established prior connections between the hilltop groups and inhabitants in the Perry Mesa area during the Pueblo III period. Our chemical analyses of phyllite-tempered pottery demonstrate the existence of ceramic-exchange relationships between the two areas at that time, as predicted by the Verde Confederacy model.

A provocative and controversial assessment of prehistoric warfare and alliance, called the Verde Confederacy model, and recent research to test it have dominated current investigations on Perry Mesa and across much of central Arizona (Abbott and Spielmann 2014; Wilcox 2005; Wilcox and Holmlund 2007; Wilcox et al. 2001a, 2001b). As discussed below, this model relies on a diachronic interpretation of settlement patterns during the Pueblo III (ca. A.D. 1100-1275) and Pueblo IV (ca. A.D. 1275-1450) time periods. In this study, we assess one aspect of the Verde Confederacy model with a complementary line of evidence directly related to patterns of interaction and based on the exchange of clay containers. The model purports that the abandonment of hilltop positions in the south and a relocation of the populations to Perry Mesa was “a planned event – in which [a] ‘castle’ defensive organization was established all at once for deliberate reasons of defense” (Wilcox and Holmlund 2007:82, see also p. 102; Wilcox 2005:28). We address the migration aspect of the model with ceramic chemical analyses.

STUDYING THE VERDE CONFEDERACY

The Verde Confederacy model begins with the settlements in central Arizona during the Pueblo III period. An array of fortified and defensively positioned look-outs, forts, and hilltop habitations stretched across the upland zone between Perry Mesa and the lowland river valleys of the Phoenix Basin (Figure 1). The hilltop array encompassed several local clusters of fortified sites situated along the Agua Fria River, New River, Upper Skunk Creek, Upper Cave Creek, Camp Creek, and overlooking the Verde River (Bruder 1982; Dove 1970; Holiday 1974; Redman and Minnis 1992; Spoerl and Gumerman 1984; Valehrach and Valehrach 1984; van Waarden 1984). According to the Verde Confederacy model, a network of line-of-sight relationships interconnected the Pueblo III sites for rapid communication and defense against Hohokam enemies situated to the south in densely settled irrigation communities along the lower Salt River (Wilcox 2005:27; Wilcox et al. 2001b:116-118, 121). Stores of surplus crops at Hohokam villages may have been targets for northern raiders, who occupied relatively dry and agriculturally marginal lands.

Possibly to better defend against retaliatory strikes from the large Hohokam populations, researchers speculate that the members of the Pueblo III alignment were “immediately redeployed into a set of brand new defensive systems” on Perry Mesa, Bloody Basin, and the middle Verde River area at the start of the Pueblo IV period (Wilcox 2005:28; see also Wilcox and Holmlund 2007:82, 102). Probably joined by local populations and other migrants from the north and west, the hilltop groups helped configure the new and expanded line of defense—the so-called Verde Confederacy of the Pueblo IV period. Incorporating more than 10,000 people, the Verde Confederacy would have been the largest political

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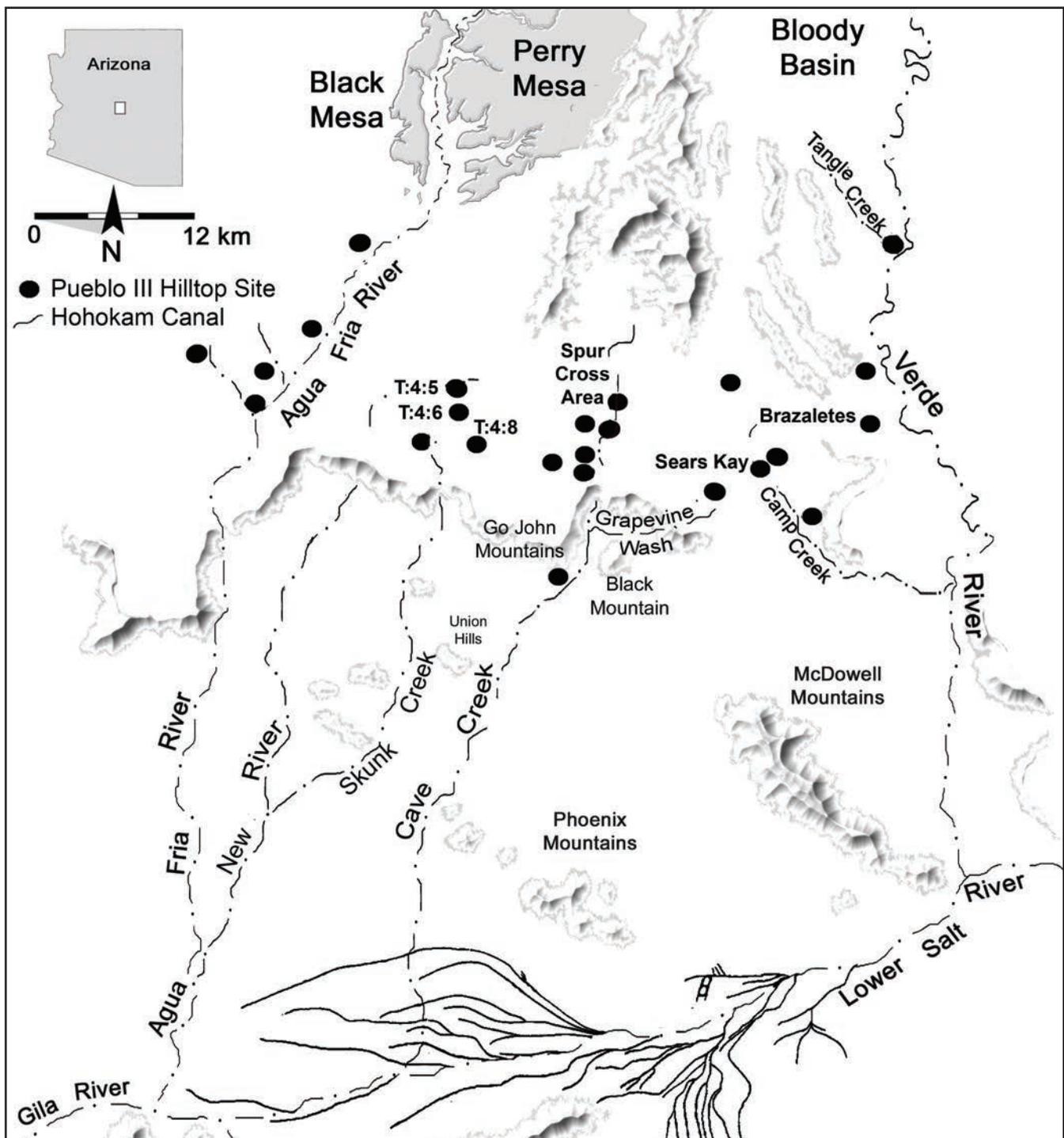


Figure 1. Hilltop and fortified settlements in central Arizona during the Pueblo III Period (illustration by Will G. Russell).

alliance in the Southwest and the leading proponent of warfare across much of central Arizona (Figure 2; Wilcox 2005; Wilcox et al. 2001a, 2001b).

Various aspects of the Verde Confederacy model are currently under investigation, including the Pueblo IV occupation atop Perry Mesa (Abbott and Spielmann 2014), and the network of interaction among the Pueblo III local groups in the upland zone overlooking the lower Salt River Valley (Abbott and Lack 2013). In this paper,

we assess the particular aspect of the model pertaining to the exodus of the Pueblo III hilltop residents and their purported strategic deployment to Perry Mesa to protect other parts of the alliance (Wilcox 2005:30). According to the Verde Confederacy model, around A.D. 1275, there was a rapid and wholesale migration to the mesa top. The newcomers immediately built large room-blocks at or near the mesa rim, which were in positions to guard all of the access routes onto the mesa from

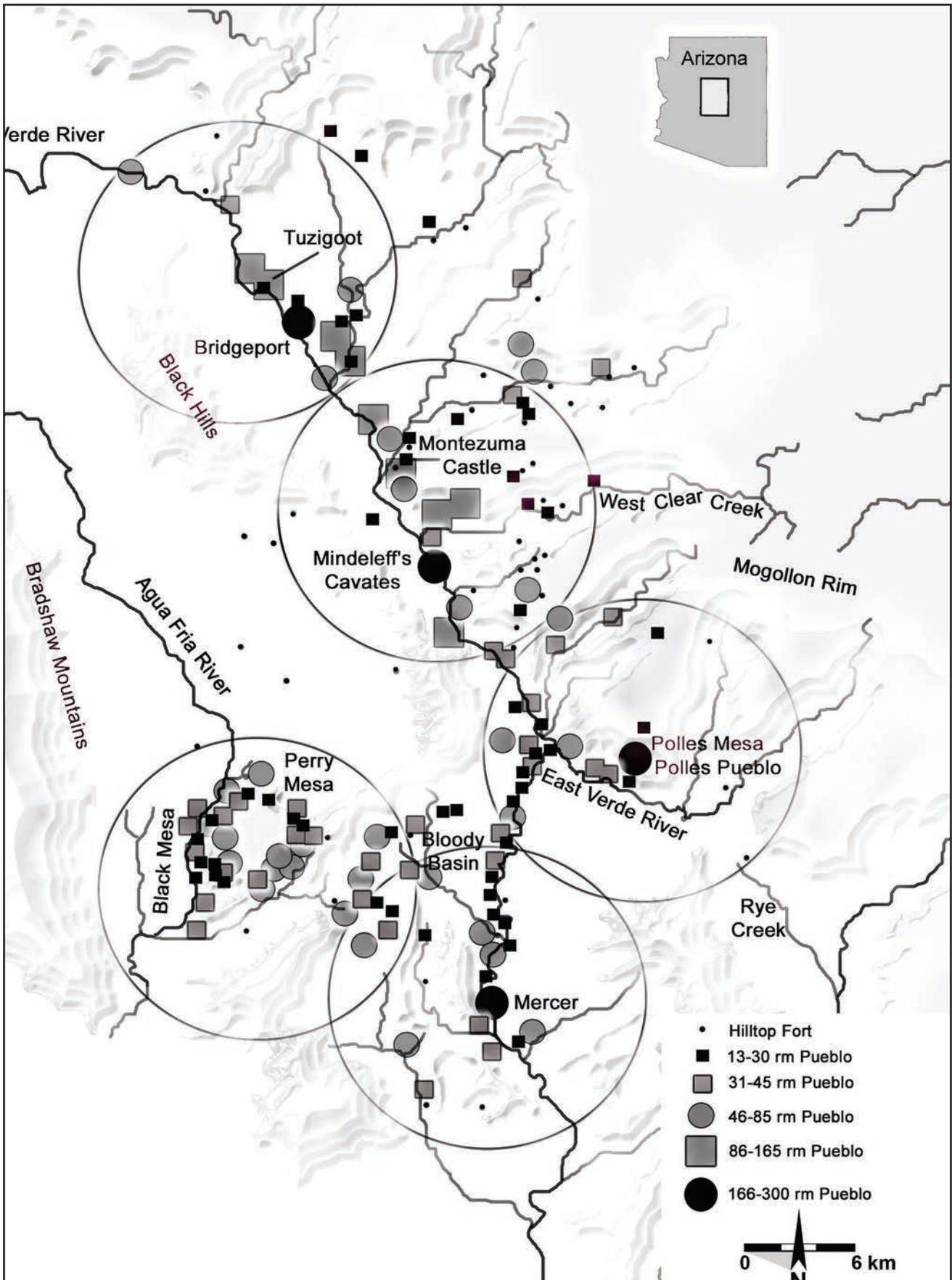


Figure 2. The proposed Verde Confederacy of the Pueblo IV Period (illustration by Will G. Russell, after Wilcox 2005:26).

below (Wilcox 2005:28; Wilcox and Holmlund 2007:21; Wilcox et al. 2001a).

The question we address is: Did some of the immigrants to Perry Mesa originate from the Pueblo III hilltop settlements, as hypothesized by the Verde Confederacy model? During the Pueblo III period and prior to the presumed redeployment to Perry Mesa, small pockets of habitation were settled on and around Perry Mesa. Presumably, if the Pueblo III hilltop groups did move en masse to the mesa top, we might expect to see indications for prior connections between the migrants and the local residents for two reasons.

First, the process of migration tends to unfold in a patterned way. Migrant groups do not randomly travel across the landscape and seldom enter unknown territory. They travel along established lines of communication or trade where they receive information about potential destinations and the differences between the home range and economic, social, and defensive opportunities elsewhere (Anthony 1990; Cameron 1995; Clark 2001; Fish and Fish 2006).

Second, presumably, the Verde Confederacy possessed the wherewithal to undertake coordinated actions for the common defense (see Upham et al. 1994). A strategic maneuver to Perry Mesa would have required considerable forethought, familiarity with the landscape, and the cooperation with the local inhabitants. Connections between the Pueblo III hilltop residents and the neighboring populations to the north would have been essential prior to the mass movement of population.

As we show with our analysis, there is, indeed, solid evidence to establish a connection between Perry Mesa and the hilltop settlements. To demonstrate that connection we use a recently formulated approach based on the compositional analysis of phyllite-tempered plain ware ceramics (Abbott et al. 2007, 2008, 2012; Abbott and Lack 2013; Abbott and Watts 2010). As revealed by separate chemical analyses of the temper particles and clay fractions with an electron microprobe, plain ware pots were made at various places across the region and were oftentimes transported and exchanged between different parts of the territory. Their movement outlines patterns of interaction useful for evaluating the relationships among various populations in central Arizona. In this study, we find pots made at the Pueblo III hilltop settlements in significant numbers at the Pueblo III Perry Mesa sites, implying regular ties between the hilltop and mesa inhabitants.

PHYLLITE-TEMPERED POTTERY

We focus on plain ware pottery tempered with abundant, coarse, angular, platy fragments of phyllite. In the upland zone north of the lower Salt River Valley, and the area in which the Pueblo III hilltop settlements were located, the upland potters almost exclusively fa-

vored phyllite for tempering their wares. The angular fragments of this metamorphic rock type bound well with the clay, producing durable, thin-walled vessels. Probably because raw phyllite was readily available at numerous and widespread bedrock exposures, it was used to temper nearly all of the pottery found at upland settlements. As described in the next section, the phyllite-tempered pottery has proven amenable to provenance analyses based on the chemical composition of the clay fraction and the phyllite particles. Consequently, we are confident in our ability to trace the movement of phyllite-tempered wares with excellent precision in central Arizona.

PREVIOUS FINDINGS

Our work with the phyllite-tempered pottery from central Arizona has shown that a wide range of chemical variation is evident, suggesting sufficient diversity with which to discern chemical patterning and provenance-related differences. Fortunately, the geology of the uplands north of the lower Salt River Valley has been mapped, and the known locations of phyllite are numerous and widespread (Figure 3). The Proterozoic phyllite outcrops observed in central Arizona are generally recognized and mapped by their fine-grained character and color (e.g., Ferguson et al. 1998; Skotnicki et al. 1997). Foliation is rarely a distinctive feature, indicating low deformation, and primary sedimentary structures are often observed. Each of the distinctive geologic units of phyllite is associated with a different sedimentary source and depositional environment, implying potential bulk chemical differences at the outcrop scale. Our collection and microprobe analyses of 209 phyllite bedrock samples from across the upland zone have verified the utility of the bulk chemistry for ceramic provenance studies, demonstrating that the phyllite is chemically diverse and differentiable by source area (Abbott 2004; Abbott et al. 2007, 2008, 2012; Abbott and Lack 2013; Abbott and Watts 2010; Mauz and Abbott 2007).

Also, our previous work has demonstrated distinctive ceramic groupings, based on clay chemistry, which were replicated when the categorization was based on the chemical composition of the temper. This two-pronged chemical strategy—analyzing clay and temper independently—is a central element of our research program (Abbott 2006; Abbott et al. 2007, 2008; Abbott and Lack 2013; Abbott and Watts 2010).¹

REFERENCE GROUPS

Our programmatic goals are to distinguish provenance-related ceramic varieties, demarcate their distribution across central Arizona, and thereby outline networks of pottery exchange. To do so, we rely on a reference-group approach. We define a reference group at a particular site as a set of abundantly occurring

ceramics, characterized by chemically similar phyllite fragments and clay fractions, which are mutually distinguishable from those in other reference groups at other sites.

The local provenance of a specific reference group at or near a particular site can be established with considerable confidence when the likely bedrock source of the phyllite temper in the reference group is chemically determined to be in proximity to the site. An exhaustive sampling and documentation of the central Arizona phyllite has not yet been realized, however, and chemical “matches” between the temper in some reference groups and bedrock units have not been established. In such cases, we invoke the principle of archaeological abundance (Rands and Bishop 1980) to tentatively infer that the most common ceramic variety present at a site was the variety most likely to have been produced locally. Also, a correlate of the principle of archaeological abundance serves an important role for tracing pottery exchanges, stating that the minority varieties in an assemblage are the most likely ceramics to have been manufactured elsewhere and imported. Once the minority specimens are identified on the basis of both their temper and clay chemistry, determining where they might have originated depends on “matching”

their compositions to those of a reference group at another location.

Our previous research has established various reference groups for different time periods and locations in central Arizona. For the present study, we focus on five reference groups that correspond to the Pueblo III hilltop occupations in the upland zone north of the Phoenix Basin. They include, from west to east, two reference groups from the upper Skunk Creek area, a reference group from the upper Cave Creek locale, another from Sears Kay Pueblo near Camp Creek, and a fifth group from Brazaletes Pueblo overlooking the Verde River (see Abbott and Lack 2013; see Figure 1).

In the upper Skunk Creek area, our previous work has found two chemically distinct phyllite-tempered varieties. One kind dominates the pottery assemblage at AZ T:4:8(PC), the largest hilltop pueblo in the Skunk Creek area. The other variety comprises the majority of the ceramics at AZ T:4:5(PC), a fortified hilltop retreat, as well as the ceramic collections from AZ T:4:6(PC), a hilltop habitation (Spoerl and Gumerman 1984). We have labeled these two reference groups as “Skunk 8” and “Skunk 5 & 6,” respectively. We collected raw phyllite samples from a bedrock unit situated proximate to AZ T:4:5(PC) and AZ T:4:6(PC). The raw samples are

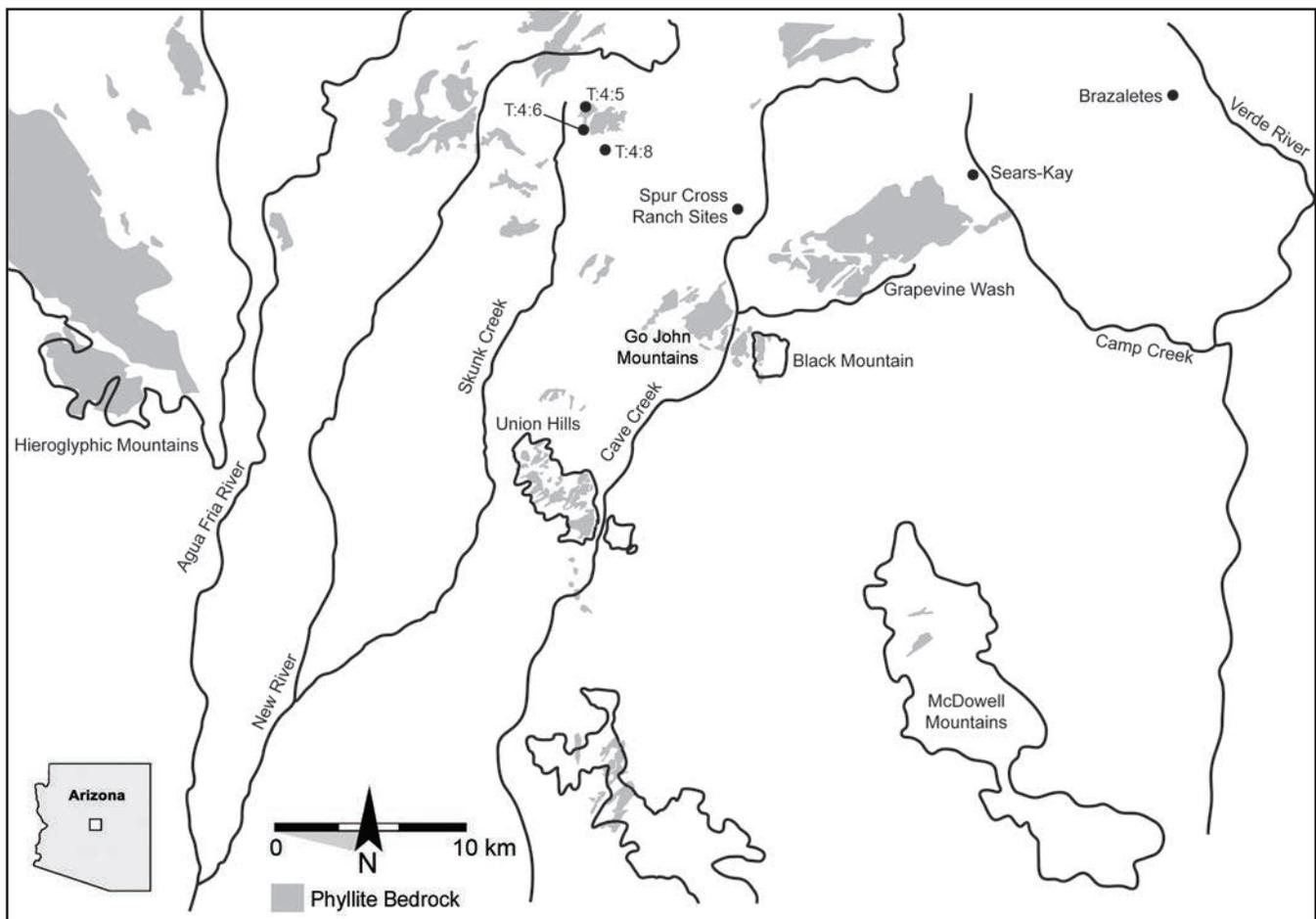


Figure 3. The distribution of phyllite bedrock units in central Arizona (illustration by Will G. Russell).

chemically consistent with the temper fragments in the Skunk 5&6 reference group (Abbott and Lack 2013). The bedrock source for the Skunk 8 phyllite temper remains to be determined.

The reference group for the upper Cave Creek area is chemically characterized by highly distinctive ceramics that are found in abundance in at least two Pueblo III habitations in that area. They include the Spur Cross Ranch site and AZ U:1:19(ASU). Both sites are substantial pueblos, with the latter being the biggest settlement along the Upper Cave Creek drainage (Redman and Minnis 1992). The phyllite particles that temper the Upper Cave Creek reference group contain extreme concentrations of potassium ($K > 6.7\%$), although the bedrock source for this material has yet to be located (Abbott et al. 2007, 2008).

Sears Kay and Brazaletes Pueblos are also the biggest habitation sites in their vicinities, and both were built in defensible and elevated places. Their local ceramics are best distinguished chemically from one another and from the other reference groups in multivariate factor space (Abbott and Lack 2013). The bedrock sources of their temper also remain to be determined.

NEW CERAMIC SAMPLES

For the present study, we add the chemical analyses of 72 phyllite-tempered sherds from Pueblo III contexts at four sites on or near Perry Mesa (Table 1, Figure 4). These samples were chosen from among the phyllite-tempered specimens collected during the excavations at the sites (Gumerman et al. 1975). They were derived from various contexts to minimize the chances of including sherds from the same pot.

Phyllite-tempered wares are in the minority at all four locations, indicating that the wares were probably imported from outside the Perry Mesa area. Our analysis was designed to determine if the chemistry of the clay and temper fractions in each of the Perry Mesa samples is consistent with any of the Pueblo III reference groups. A chemical consistency would imply the Perry Mesa specimen probably originated among the Pueblo III hilltop settlements.

The first of the four Perry Mesa sites we sampled was a Pueblo III roomblock in the Brooklyn Basin area. AR-03-12-01-1759 was built on the slope of the mesa wall, a short distance below the eastern rim of Perry Mesa. We rely on surface samples recently collected by members of the Desert Foothills Chapter of the Arizona Archaeo-

logical Society in conjunction with the Tonto National Forest. For our purposes, we label this site "Brooklyn 1759."

Situated on the eastern rim of Perry Mesa is Las Mujeres, a large Pueblo IV roomblock, surrounded by several small Pueblo III habitations (J. Scott Wood, personal communication, 2012). From the surface of the general area, we collected phyllite-tempered plain wares, which we suppose dated to the Pueblo III period.²

Finally, at the bottom of Baby Canyon, below the western edge of Perry Mesa, is a 19-room settlement, AZ N:16:51(PC), which dates to the Pueblo III period. Also, above that site, on a promontory jutting out from the canyon wall, is AZ N:16:46(PC). In addition to two Pueblo IV roomblocks at that site, a Pueblo III rock shel-

Table 1. Ceramic Specimens Assayed for the Present Research.

Site Name	Number	Location	Samples	N
Baby 46	AZ N:16:46(PC)	Baby Canyon	BAB001-004, BAB006-022	21
Baby 51	AZ N:16:51(PC)	Baby Canyon	BAB023-042	20
Brooklyn 1759	AR-03-12-01-1759	Brooklyn Basin	BRK001-010	10
Las Mujeres	AR-03-12-01-55	Perry Mesa	LMJ100-120	21
Total				173

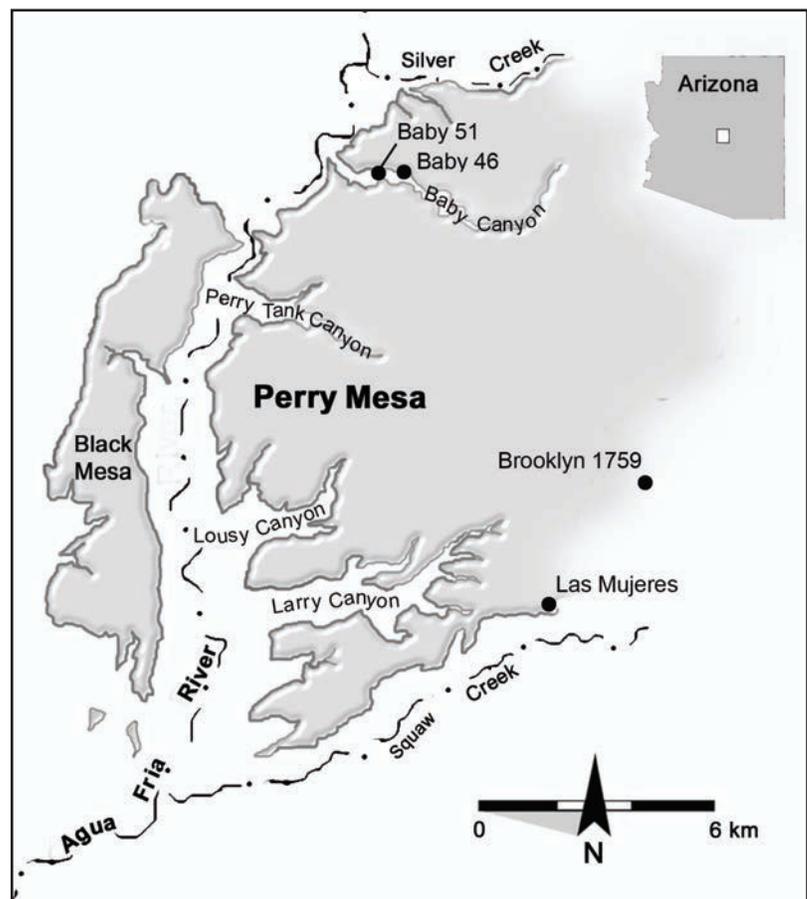


Figure 4. The location of four sites in the Perry Mesa area (illustration by Will G. Russell).

ter was associated with a sizeable amount of phyllite-tempered pottery. Both of the Baby Canyon sites were partially excavated (Gumerman et al. 1975), and we derived our samples from those collections. For our purposes, we label the two sites, "Baby 51 and 46," respectively.

MICROPROBE METHODOLOGY

The microprobe directs a stream of high-energy electrons onto a small spot on the sample's surface and analyzes the wavelengths of emitted x-rays produced by the bombardment. The relative intensities of the x-rays created at each wavelength indicate the relative abundance of each chemical element in the sample (Birks 1971). Its advantage for ceramic studies over similar but bulk type techniques, such as x-ray fluorescence analysis and neutron activation analysis, is the probe's capacity to select tiny areas of a sherd's cross-section for study, permitting, for instance, the analysis of just the clay fraction with only minimal contamination from temper particles (Freestone 1982). In this way, chemical data can be derived from both the clay and temper fractions, which are independent from one another.

Spots approximately 0.1 mm² in area (about the size of a period on this page) were assayed using 300X magnification. In the case of clay analyses, the spots were carefully selected to avoid non-plastic inclusions, although silt-sized particles were almost always unavoidable. The effects of these tiny inclusions on the analysis of Hohokam ceramics have been checked experimentally, and were found to be inconsequential (Abbott 1994a). In the case of temper analyses, the temper fragments were sufficiently large to ensure that the results pertained exclusively to the phyllite fragment's chemical composition. Phyllite is a fine-grained rock type that is composed of microscopic crystals of different minerals (quartz, chlorite, sericite mica) but, at the scale for the probe analyses, the phyllite fragments were relatively uniform.

A JEOL JXA-8600 electron microprobe with an automated energy-dispersive analysis system was used to perform the analyses. Each potsherd was cut to extract a thick slice of its cross section that was then mounted on a circular glass slide. The thick section was then ground, polished, and coated with a 400-Å-thick layer of carbon.

All samples were analyzed using 15-kV filament voltage and a 10-nA defocused beam current. The x-ray detector was mounted at a take-off angle of 40°. Matrix effects were corrected with a ZAF algorithm, and the equipment was calibrated with a Kakanui hornblende standard (Mason and Allen 1973). Five clay spots and five phyllite fragments were analyzed for each sample. The detector live-counting time was 50 seconds. The percentages of eight chemical elements (Na, Mg, Al, Si, Ca, K, Ti, and Fe) were determined. The percentages of four other minor elements were also measured by

the microprobe, but those data were not used because the precision of their measurement was insufficient for statistical analysis. The quantities of all 12 elements summed to 100 percent. All of the analyses were performed by the authors in the Department of Chemistry and Biochemistry at Arizona State University, Tempe.

DATA SCREENING, TRANSFORMATION, AND ANALYSIS

An experiment to determine the capacity of the clay fraction in Hohokam sherds to undergo post-depositional chemical alterations indicated that the capacity was substantial (see Abbott 1994b). In order to identify some altered cases in the present analysis, the Na/Al and Ca/Al ratios of the five spots analyzed for clay in each sherd were examined for consistency. These ratios are useful checks because Na and Ca concentrations in clay are easily susceptible to chemical leaching and cation exchange, whereas Al is more stable and less susceptible to post-depositional effects (Birkeland 1984:102-104). Marked inconsistency in the ratios of the clay analyses in a sherd indicates that because of the porous structure of the ceramic fabric some portions of the clay fraction probably were altered after deposition, whereas other areas were left relatively unchanged (Freestone et al. 1985).³ Also, obvious extreme percentages for some elements can occasionally occur in the analyses of particular spots (i.e., elemental amounts that were double or half those in the other clay analyses from the same potsherd). Of the 360 clay-fraction analyses, 12 were inconsistent (3.3%), and those data were dropped from the statistical manipulations. For the clay analysis of each sherd, the five analyses (or fewer if one or more spots were dropped) were averaged to produce mean percentages of each of the eight chemical elements.

For the temper and raw phyllite analyses, we assumed that Ca and Na mobility was not a problem. Fresh surfaces of the phyllite rock and temper fragments were exposed when the sample cross-section was cut during the preparation of the microprobe thick section. Phyllite is a dense, fine-grained rock type, whose internal matrix is not susceptible to chemical leaching or cation exchange, unlike the porous fabric of a ceramic's clay matrix.

It was also important to treat the analyses of different temper fragments separately, rather than lumping them together and averaging their chemical data, because there was no guarantee that all of the phyllite particles in a sherd were derived from the same source material. For that reason, each temper analysis was included as a discrete data point for the statistical manipulations. A listing of the raw chemical data was too long to include with this paper, but will be made available upon request.

The data analysis of both the clay and temper depended on factor analyses in which the percentages of

all eight chemical elements were entered. Those factors associated with an eigenvalue greater than 1.0 were extracted and rotated with a varimax procedure. When the set of extracted factors accounted for less than 70 percent of the original variation, additional factors were extracted and rotated in order to achieve that threshold. Prior to a particular factor analysis, the multivariate distribution of the data was checked for normality with univariate and bivariate plots. The distributions of some individual elements were skewed and were made quasi-normal with a log10 transformation. We also calculated the squared Mahalanobis distance in the factor space from the group centroid to individual data points in order to assess the likelihood that specific cases were members of the group. The squared distances follow a chi-square distribution with degrees of freedom equal to the number of factors (Tabachnick and Fidell 1983:336).

Finally, we created two multivariate factor spaces for each reference group, one for clay and one for temper. Within those factor spaces, we measured the Mahalanobis distance between the reference-group centroid and each of the Perry Mesa specimens in the sample. Our provenance assignments were based on those measurements.

In particular, we applied three criteria for the provenance classification. First, for an assignment to a particular reference group, a ceramic piece from the Perry Mesa area must include four or five temper fragments that fall within the 95-percent confidence ellipsoid surrounding the reference-group centroid for the phyllite analyses. That is, if a sherd belongs to a particular reference group, then "95 percent" of its temper particles (i.e., 4 or 5 of the 5 temper fragments analyzed per sherd) should fall within a 95-percent confidence ellipsoid. Second, at least one temper fragment must fall close to the reference-group centroid for phyllite analyses (i.e., within the 20-percent confidence ellipsoid). We expect at least one of the five temper analyses (20%) to fall within the 20-percent ellipsoid. Third, the clay fraction must plot within the 30-percent confidence ellipsoid of the reference-group centroid for clay analyses. According to this criterion, only the best 30 percent of the ceramic cases belonging to a particular reference group will be assigned to that group. Consequently, this strategy for "matching" ceramic specimens to reference groups was a conservative one that yielded high-confidence assessments. Only cases that proved to be an especially good fit to a particular reference group were classified. Importantly, this strategy also minimized the possibility that non-members of a reference group would be incorrectly assigned to that group.

RESULTS

As noted, the chemical composition of each sherd sample from the Brooklyn Basin, Las Mujeres, and Baby Canyon sites was compared to the compositions of the

Table 2. Provenance Classification -- Skunk 8 Reference Group.

Site	Sample	Temper		Clay
		4-5 in 95% Conf.	20% Conf.	30% Conf.
Baby 46	BAB006	X		
	BAB009	X		
	BAB010	X	X	
	BAB012	X		
	BAB014	X		
	BAB020	X	X	
Baby 51	BAB026	X	X	
	BAB027	X	X	
	BAB028	X		
	BAB030	X		
	BAB033	X		
	BAB036	X	X	
Brooklyn 1759	BAB040	X	X	X
	BAB042	X	X	X
	BRK001	X		
	BRK002	X		
	BRK003	X		
	BRK004	X		
Las Mujeres	BRK005	X	X	
	BRK007	X		
	BRK008	X		
	BRK009	X		
	BRK010	X		
	LMJ100	X	X	X
LMJ101	X	X	X	
LMJ102	X	X	X	
LMJ103	X	X		
LMJ104	X			
LMJ105	X			
LMJ106	X			
LMJ107	X	X	X	
LMJ108	X	X	X	
LMJ110	X	X	X	
LMJ111	X	X	X	
LMJ112	X	X		
LMJ113	X			
LMJ114	X	X	X	
LMJ115	X	X	X	
LMJ117	X			
LMJ119	X	X		

Table 3. Factor Loadings and Provenance Assignments Related to the Skunk 8 Reference Group.¹

Element	Factor 1	Factor 2	Factor 3
Na	.074	.129	.964
Mg	-.009	.894	.017
Al	-.895	-.285	-.164
Si	.925	.027	-.332
K	-.697	-.462	.449
Ca	.460	.684	.187
Ti	.806	-.011	.126
Fe	-.595	-.341	-.164
Eigenvalue	3.920	1.456	1.028
% of variation	49.00	18.20	12.85

Provenance Assignments (Matches to Skunk 8)	
Recovery Site	Sample Numbers
Las Mujeres	LMJ100, 101, 102, 107, 108, 110, 114, 115
Baby 51	BAB040, 042

Note: ¹Clay data.

five reference groups in order to identify likely exports made by potters at the Pueblo III hilltop sites and sent to the Perry Mesa locales. We started by entering the chemical data from the phyllite fragments in the Skunk 8 reference group into a factor analysis. We then measured the squared Mahalanobis distance in that multi-dimensional factor space between each phyllite particle in the Perry Mesa samples and the centroid of the Skunk 8 phyllite data.

Applying our first criterion for establishing ceramic provenance, we listed 40 of the Perry Mesa sherds that contained either four or five temper particles sufficiently similar to the Skunk 8 temper fragments to fall within the 95-percent confidence ellipsoid (Table 2). Of those 40 sherds, 20 contained at least one piece of phyllite that was quite similar to the average Skunk 8 temper fragment (i.e., falls within the 20-percent ellipsoid surrounding the Skunk 8 centroid; our second criterion). Next, we entered the clay data from the sherds in the Skunk 8 reference group into another factor analysis, from which three factors were extracted (Table 3). The centroid from the Skunk 8 reference group was established in that three-dimensional factor space and the squared Mahalanobis distance was measured between the centroid and the clay data for each of the 20 Perry Mesa samples we identified above. Figure 5 plots the first two factors and the positions of the 11 Perry Mesa samples that fall within the 30-percent ellipsoid (our third criterion; see Table 2). On this basis, there is strong evidence to infer that nine samples from Las Mujeres and two cases from Baby 51 were produced in the Skunk Creek area and exported to the Perry Mesa area (see Table 3).

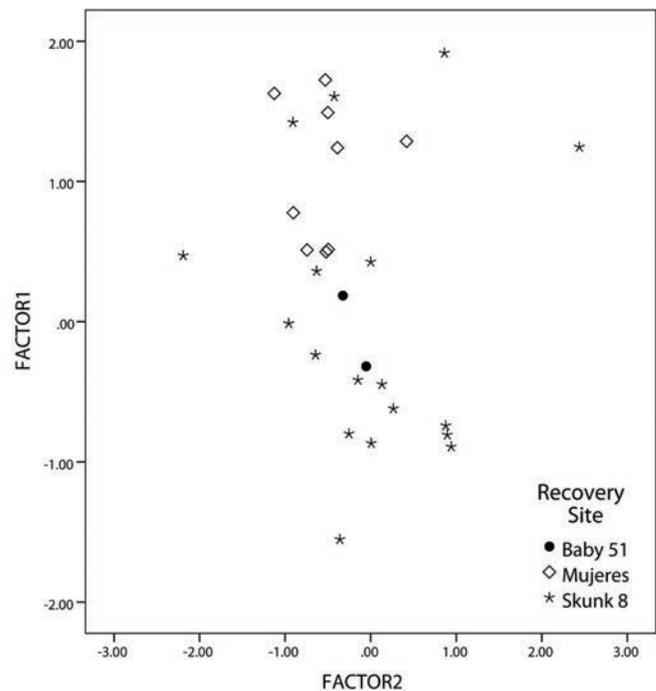


Figure 5. Clay fraction Factor Analysis of the Skunk 8 Reference Group with the positions of 11 likely imports.

We followed the same series of steps using the Skunk 5 & 6 reference group, and three of the Perry Mesa sherds proved to be excellent matches to the Skunk Creek pottery (Table 4, Figure 6). Similarly, we repeated the steps with the Upper Cave Creek reference group, and one more sample from Perry Mesa was identified as a likely import from the Upper Cave Creek area (Table 5, Figure 7). Finally, when we applied the three provenance criteria using the Sears Kay and Brazaletes reference groups, we failed to find any good matches among the Perry Mesa specimens.

DISCUSSION

The Verde Confederacy model is a provocative and controversial proposal about warfare and alliance at an unprecedented scale in central Arizona during the Pueblo III and Pueblo IV time periods (Wilcox 2005; Wilcox et al. 2001a, 2001b). According to the model, endemic hostilities began between the Pueblo III hilltop dwellers and Hohokam farmers in the Phoenix Basin. Conflict then escalated after A.D. 1275 when the confederacy swelled to include 10,000 people or more along the middle Verde River, Bloody Basin, and Perry Mesa, and when the Pueblo III hilltop populations and other migrants were relocated to more defensible positions atop Perry Mesa. In recent studies, multiple lines of evidence have challenged various aspects of the Verde Confederacy model, pertaining to the Pueblo III (Abbott and Lack 2013) and Pueblo IV periods (Abbott and Spielmann 2014).

In this paper, we have considered one particular aspect of the model – the Pueblo III hilltop residents aban-

Table 4. Factor Loadings and Provenance Assignments Related to the Skunk 5&6 Reference Group.¹

Element	Factor 1	Factor 2	Factor 3	Factor 4
Na	-.455	-.178	-.071	-.534
Mg	-.133	.550	.723	.104
Al	.930	-.100	-.041	.096
Si	-.880	-.189	-.285	.161
K	.471	-.496	.000	-.521
Ca	.144	.954	-.036	.035
Ti	-.065	-.028	.047	.859
Fe	.247	-.197	.885	.038
Eigenvalue	2.317	1.982	1.130	1.058
% of variation	28.96	24.77	14.12	13.23

Provenance Assignments (Matches to Skunk 5&6)	
Recovery Site	Sample Numbers
Brooklyn 1759	BRK007
Baby 46	BAB010
Baby 51	BAB033

Note: ¹Clay data.

doned their elevated habitations, forts, and fortified retreats to take up a new defensive position atop Perry Mesa. Our analysis confirmed there were preexisting exchange ties between the hilltop and Perry Mesa people, implying interaction that could have underpinned a wholesale migration between the two areas. Indeed, everywhere we looked, we found ceramic evidence to indicate that plain ware pots made in the Upper Skunk Creek and Upper Cave Creek vicinities were exported to the Perry Mesa area. The ceramic results, in conjunction with previous inferences about the simultaneous abandonment of the hilltop area and the arrival of immigrants on Perry Mesa, provide strong evidence to infer the origin of some of the populations who built the large pueblos on the rim of Perry Mesa.

Are our findings consistent with the Verde Confederacy model? The model predicts an across-the-board migration from the hilltop settlements along Skunk Creek and from the Upper Cave Creek area to Perry Mesa sometime around A.D. 1275. Our work demonstrates a connection between Perry Mesa and the hilltop areas during the Pueblo III period, prior to the large build up of population on the mesa top. Clearly, our results do conform to the model's predictions. But also, the results of our analyses do not exclude other possible interpretations that hang on different motivations for the abandonment of the hilltop sites and a migration to Perry Mesa. The Verde Confederacy model implies a strategic redeployment in the context of a regional-scale alliance. Other ideas consistent with the Pueblo III connections that we revealed include less coordinated and relatively

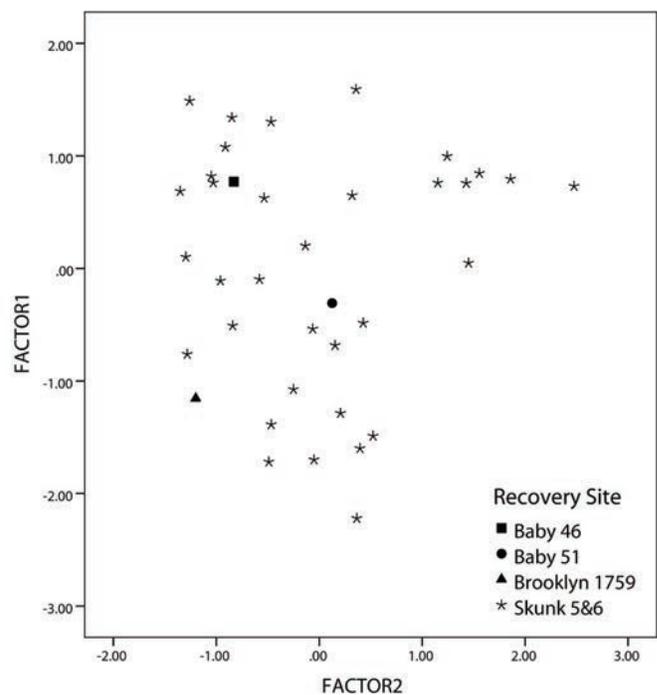


Figure 6. Clay fraction Factor Analysis of the Skunk 5&6 Reference Group with the positions of three likely imports.

small-scale movements for defense over an extended period (see Abbott 2014), and the drying out of the hilltop zone at the same time moister and thus more conducive conditions for agriculture took hold atop Perry Mesa (see Ingram 2014; Kruse-Peebles 2014; Spielmann 2014).

CONCLUSION

Our work for this study has built on a long-term research program aimed at determining the organization of production and distribution of phyllite-tempered ceramics across central Arizona. The ceramic data are clear traces of interaction among the upland populations. The analytical approach has proven useful for evaluating one aspect of the Verde Confederacy model, which purports that the residents of the fortified and hilltop settlements in the upland zone migrated en masse to Perry Mesa at the end of the Pueblo III period. Our chemical analyses of the clay and temper fractions in the phyllite-tempered wares have found ample evidence to suggest clay containers regularly moved between the hilltop area and Perry Mesa, probably reflecting open lines of communication prior to the migration – a crucial component of the migration process.

Notes

1. A potentially fruitful direction for future analysis would include petrographic analysis of the phyllite-tempered wares. The intent is not so much to distinguish phyllite varieties, but, rather, to study the mineralogy of

Table 5. Factor Loadings and Provenance Assignments Related to the Upper Cave Creek Reference Group.¹

Element	Factor 1	Factor 2	Factor 3
Log Na	-.850	.070	.121
Mg	-.027	-.044	.941
Al	.629	.704	.049
Si	-.668	-.483	-.348
K	.569	.530	.172
Log Ca	-.101	-.813	.259
Ti	-.069	.685	.088
Fe	.830	.045	-.038
Eigenvalue	3.491	1.270	1.110
% of variation	43.64	15.87	13.87

Provenance Assignments (Matches to Upper Cave Creek)	
Recovery Site	Sample Numbers
Brooklyn 1759	BRK009

Note: ¹Clay data.

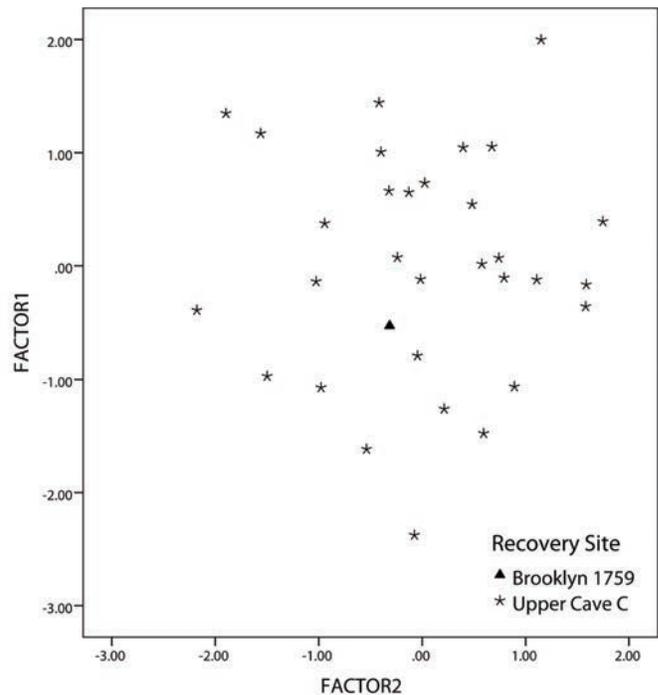


Figure 7. Clay fraction Factor Analysis of the Upper Cave Creek Reference Group with the positions of one likely import.

other sand inclusions, which sometimes occur (e.g., Abbott et al. 2012; Heidke et al. 1997). The composition of the sand fraction, if matched to the local geology, can provide useful clues for sourcing the pottery.

2. There is some uncertainty about the dating of the Las Mujeres samples. At other large late pueblos on Perry Mesa, phyllite-tempered pottery is rare to absent (Snow and Abbott n.d.; Watkins and Kelly 2014), whereas the pottery observed at several small Pueblo III sites near Las Mujeres include numerous pieces of phyllite-tempered cases. An explanation for the presumed ceramic differences between the Pueblo III and Pueblo IV periods on Perry Mesa may correspond to the abandonment of the hilltop sites around A.D. 1275. As our results intimate, many of phyllite-tempered pots on Perry Mesa probably originated in that area. Their production would have ceased when the hilltop area was vacated, and, thereby, largely precluded the deposition of phyllite-tempered wares in Pueblo IV contexts.

3. One other possibility affecting the clay-chemistry readings is worth noting. Potentially, an entire sherd could suffer from post-depositional alteration. If such cases were included here, they would be discriminated as chemical outliers.

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LAND TENURE AND THE DEVELOPMENT OF THE STONE CAMP COMMUNITY

J. Scott Courtright

ABSTRACT

The Stone Camp Community is located in an upland setting at the divide of two tributary drainages of the Verde River. The initial occupation of the study area was likely sustained by floodwater farming of relatively small areas as early as A.D. 900. By the late A.D. 1200s, habitation and dry farming areas expanded onto the surrounding upper finger ridges. In the late A.D. 1300s and 1400s, three aggregated room blocks, with a combined total of over 75 rooms, formed the core of the community. Surrounding the room blocks are more than 100 dispersed, single- and multi-room structures. In this paper, I theorize that the dispersed structures, adjacent to probable agricultural fields, represent land-tenure, dry land claims. Using ethnographic analogy and archaeological evidence, I conclude that the patterned distribution of surface structures on the upland ridges represents heritable, household-level land tenure units that evolved in response to the increased population aggregation in the valley during the late A.D. 1200s.

In this paper, I discuss the results of a multi-year study that I directed at the Stone Camp Community, in the uplands of Central Arizona, between the Verde River and Perry Mesa. The Stone Camp Community developed over a 600-year period, but was occupied intensively between the twelfth and fourteenth centuries. Recent archaeological survey, as part of this study, has identified over 150 sites that are part of this community (Courtright and Neily 2012). Site types include single- and multi-room surface masonry structures, rock-outlined structures, suspected compounds (represented by dense artifact scatters with rock alignments and rooms), and dense artifact scatters without surface architecture that may be associated with pit houses or pit rooms. Three room blocks, containing 10, 20, and 45 rooms each, and known as Stone Camp East, CP Butte Ruin, and Stone Camp Pueblo, respectively, are the most prominent components of the Classic period occupation (A.D. 1150 to 1400). Although a majority of the

sites identified within the study area are one-room surface masonry structures, a variety of multi-room structures and house clusters are located in areas surrounding Stone Camp Pueblo and Stone Camp East, in the valley bottom. Data for this study were obtained from a detailed recording of 36 percent of the sites, using detailed artifact inventories within 1 m by 1 m observation units; generalized artifact descriptions and feature descriptions for all sites were also recorded, and supplement the controlled data. No collection of artifacts was undertaken.

I propose that the clusters of small structures on the upland ridge tops, overlooking the main habitation areas in the valley bottom, represent land tenure units marking dry land agricultural fields. First, I discuss the natural environment of the Stone Camp Community and the pre-Classic (A.D. 750 to 1150) and Classic period occupations of the valley bottom to provide context for the focus of this paper, which is the function of the high density of small structures in the uplands that overlook the valley bottom. I also discuss what defines an agricultural field, as this is not readily apparent in the archaeological record. Next, I discuss environmental conditions that may have influenced the establishment of small structures in upland locations. An alternative explanation for the presence of so many small upland structures—clustering of settlements for defense—is also addressed.

ENVIRONMENT

The Stone Camp Community is situated approximately 70 km north of Phoenix, within a localized valley that divides the headwaters of Lime and Tangle creeks, approximately 13 km west of the Verde River and over 14 km east of Perry Mesa (Figure 1). It is located in a rugged landscape defined by narrow drainages surrounded

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by steep, rocky ridge tops and basalt-capped mesas. The study area is completely surrounded by towering mountains and broad, elevated mesas that are 200 m (650 ft) to 400 m (1,310 ft) higher in elevation. The Stone Camp Community is entirely within an upland setting, but it contains two distinct geographic zones—a valley bottom that averages 1,100 m (3,600 ft) in elevation, and a series of upland finger ridges that average 1,200 m (3,950 ft) in elevation (Figure 2). The Stone Camp Community, as presently defined, includes all of the upland finger ridges and the entire valley bottom of Roundtree Canyon, which leads toward Tangle Creek. It does not include the valley bottom along upper Lime Creek, where additional sites (including a large room block, artifact scatters, and surface structures) are known and could be considered part of the greater Stone Camp Community or a distinct settlement system. At first glance, the study area appears to have limited physiographic features capable of sustaining agriculture for a sizeable prehistoric population, such as that at the Stone Camp Community. Although floodwater agriculture was likely practiced in the valley bottom, there is relatively sparse arable land in this location to have supported the increased population during the Classic period. The upland zone is defined by a series of relatively narrow ridge tops that would have been ideal settings for dry land farming. These areas, however, were not expected to contain such a large number of field houses, many of which were arranged in distinct clusters. It is the distribution of these structures across the two distinct geographic zones that is key to my argument that land-use tenure markers are present in the Stone Camp Community.

The 28.3-hectare (70-acre) area along the bottom of Roundtree Canyon is characterized by a narrow floodplain with a boulder-filled channel and only small areas of fine-grained alluvium. This channel is bordered by gently sloping to level benches, with little soil development; the benches are characterized by occasional bedrock exposures and distinct colluvial cobble deposits. Very few locations suitable for agriculture have been identified, and I have yet to locate rock alignments or rock piles that would be evidence of agricultural land modification in the valley bottom. A broad, fairly level

landform above the valley bottom encompasses approximately 26.7 ha (66 ac), and slopes up to the south, toward the major drainage divide. Similar to the narrow floodplains below, the soils on this slope are poorly developed, and in many locations, bedrock exposures are covered by colluvial cobbles and gravels. I do, however, have evidence of agricultural fields on the lower slopes, adjacent to the Stone Camp East room block, where ephemeral rock alignments and possible terraces were noted in relatively small areas that also exhibited better soil development. Another area of suspected agricultural features is on the upper slopes of the landform near the drainage divide, adjacent to CP Butte Ruin. These suspected terraces are thought to be more substantial, and likely cover a much larger area than the features near Stone Camp East.

The upland ridges along the east and west sides of the valley bottom encompass a total of 74 ha (183 ac). The ground surface and soils are markedly different

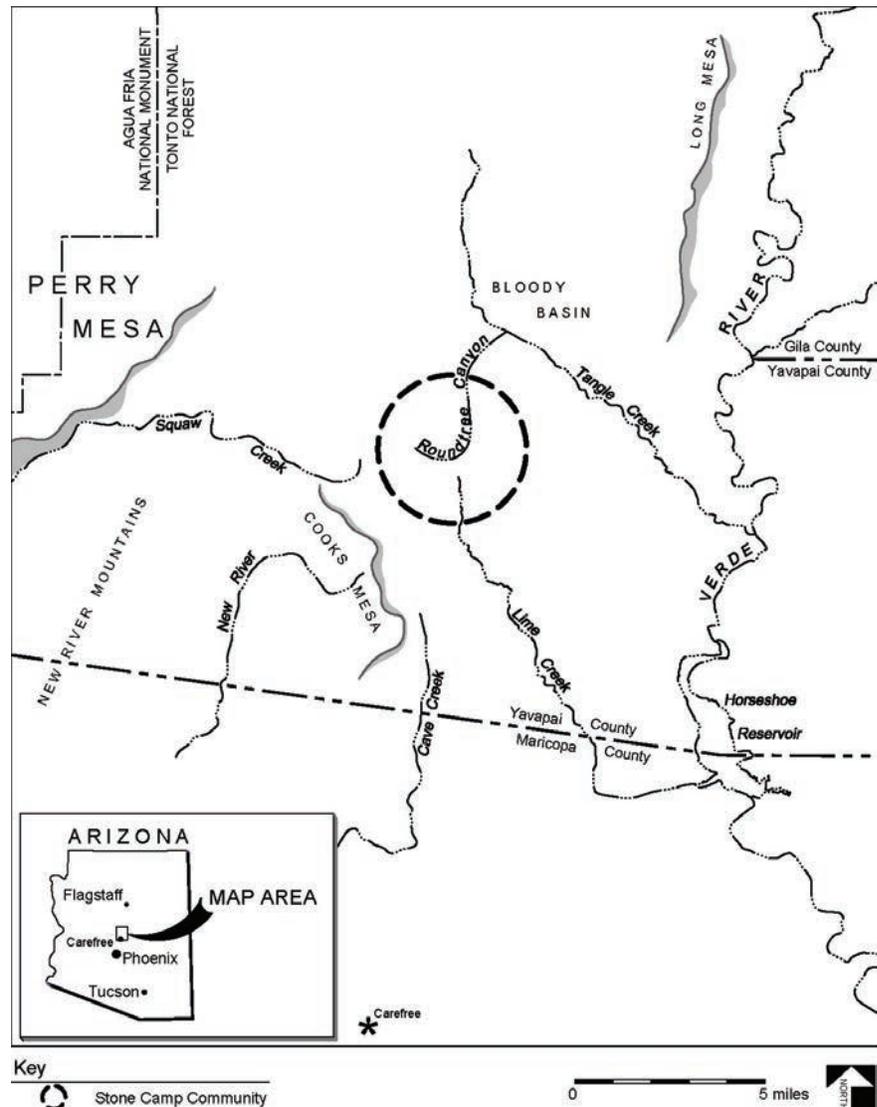
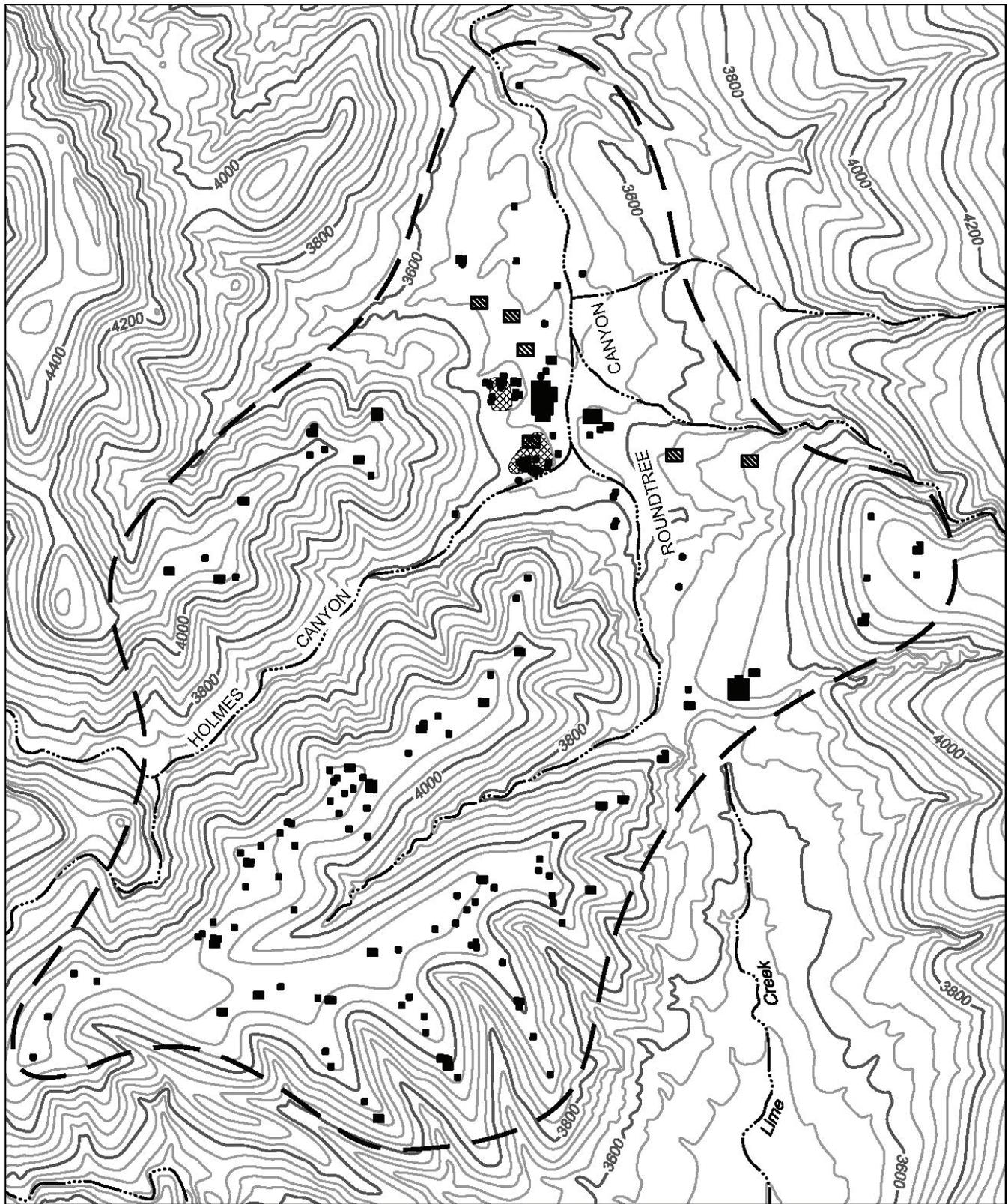


Figure 1. Location of the Stone Camp Community.



Key

- Stone Camp Community study area
- Masonry structure
- Early Classic habitation
- Pre-Classic habitation area

0 500 meters



Figure 2. The Stone Camp Community Study Area.



Figure 3. The Western Upland Finger Ridges, with the New River Mountains and the Basalt-Covered Cooks Mesa in the Background (Facing West).

between the two sides of the valley. The silty, clay soils on the narrow, western ridge tops and numerous finger ridges that extend from the main ridge tops contain an abundance of cobbles (including dacite toolstone) and gravels, although areas without cobbles are present. The lone eastern ridge top is distinct from the west upland ridges in that it is broad, mostly level, and basalt-covered. It lacks the colluvial deposits, dacite toolstone, and silty, clay soils of the western upland ridges. No terraces, rock piles, or rock alignments of suspected agricultural features have been identified on any of the upland ridges.

The western upland ridges consist of three narrow ridge tops with steep slopes, including the southernmost ridge with seven distinct finger ridges (Figure 3). The lower slopes of each ridge are marked by nearly vertical exposures of bedrock. The western upland ridges have rounded ridge tops that are level to gently sloping surfaces that range from 1,210 to 1,280 m (3,970 to 4,200 ft) in elevation. The two southern ridges measure nearly 2.2 km long, east-west, and the tops are from 100 to 200 m (330 to 660 ft) wide, with the southern ridge

being slightly narrower overall. Altogether, the southern ridges encompass approximately 53 ha (130 ac). The seven narrow finger ridges vary from 170 to 700 m in length, and descend at least 60 m (200 ft) in elevation, terminating at the top of the vertical bedrock exposure. The finger ridges average less than 5 m wide, and have slopes of 10 to 35 percent. A small, upland ridge north of the two southern ridges measures less than 1 km long by 60 to 120 m wide. The level top of this ridge encompasses only 5 ha (13 ac) and ends abruptly to the west, where there is a steep slope of igneous rock.

The single upland ridge on the east side of the valley overlooks the major drainage divide and CP Butte Ruin. This broad, gradually-sloping landform is at a similar elevation as the western upland ridges, and measures 350 m wide (north-south) by nearly 600 m long (east-west), and encompass 16 ha (40 ac). The slopes surrounding this ridge are much steeper than the slopes on the west side of the valley, and the underlying, basalt bedrock lacks the soils of the western upland ridges.

There are over 15 named springs within a 4-km radius of the Stone Camp Community, with many additional,

unnamed seeps present. Riparian habitats are present in Roundtree Canyon and Holmes Canyon, with ash and sycamore trees established in these well-watered locations. Annual precipitation ranges from 8 to 17 in, approximately 50 percent of which falls in the summer months. The mean summer temperature is around 84 degrees Fahrenheit, and the mean winter temperature is approximately 50 degrees Fahrenheit (Western Regional Climate Center 2012; Brown 1994).

CHRONOLOGY

The Stone Camp Community was occupied over a 600-year period, based on diagnostic pottery and distinctive architectural features, such as rock-lined pit structures, surface masonry structures, compounds, and aggregated room blocks. The Pre-Classic period is defined by suspected pit house locations that are recognized only by extensive artifact scatters with diagnostic pottery. The early Classic period also has complex artifact scatters, but also contains the indistinct surface remains of compounds and rock-outlined structures. The late Classic period is represented by more substantial rubble mounds of single- and multi-room surface structures, as well as small room blocks and large pueblos. Diverse artifact scatters are limited to the larger habitations during the Classic period, with many of the single-room structures lacking artifacts. All of these feature types are present in the study area, and their numbers and locations are the data that drive this article. The spatial patterning of these features is the basis of my argument that land tenure was practiced in the study area, and that land-tenure markers were necessary because of an increase in population during the late Classic period, a time when multi-room surface masonry structures were constructed.

PRE-CLASSIC OCCUPATION IN THE VALLEY BOTTOM

The earliest occupied sites identified in the Stone Camp Community are along the bottom of Holmes Canyon and Roundtree Canyon (see Figure 2). The two distinct habitation areas attributed to the earliest occupation of the Stone Camp Community (A.D. 800 to A.D. 1150) are limited to the valley-bottom area surrounding Stone Camp Pueblo on the west side of Roundtree Canyon and a nearby bench that borders Holmes Canyon (Figure 4). These habitation areas are locations of suspected pit houses, and are characterized by very dense sherd and flaked-stone artifact scatters associated with level to gradually sloping surfaces. One area measures over 100 m long by 40 m wide, is nearly devoid of rock, and the gentle slope below this is covered by an extremely dense artifact scatter representative of a midden deposit. Another probable pit house locus along Holmes Canyon measures over 150

Table 1. Diagnostic Ceramics of the Pre-Classic Period.

Kana'a Black-on-white	A.D. 725/825–1000
Gila Butte Red-on-buff	A.D. 750–850
Santa Cruz/Sacaton Red-on-buff	A.D. 850–1150
Black Mesa Black-on-white	A.D. 1000–1100
Dogoszhi Black-on-white	A.D. 1040–1220
Holbrook A Black-on-white	A.D. 1050–1150
Sosi Black-on-white	A.D. 1070–1180

Haury 1976; Hays-Gilpin and van Hartesveldt 1998; and Wood 1987.

m long by 80 m wide. Also present in this area are rock alignments and rooms of suspected compounds from the early Classic period habitation, as well as single- and multi-room surface masonry structures.

The high-density artifact scatters associated with habitation areas contain a wider variety of pre-Classic period ceramic types than anywhere else in the study area. A widespread, low-density scatter of slag and fire-cracked rock from suspected buried roasting pits is also in these areas, but no mounded roasting pits or surface indications of roasting pits have been documented in these locations. Observed diagnostic types include Little Colorado White Ware, Tusayan White Ware, Hohokam Buff Ware, Tsegi Orange Ware, and Tusayan Gray Ware (Table 1). The Gila Butte Red-on-buff and possible Kana'a Black-on-white sherds suggest the valley bottom was first settled during the Colonial Period (A.D. 750 to 950), but in general, the remainder of the ceramics are suggestive of a pre-Classic occupation dating between A.D. 950 and 1150 (Wood 1987; Wood, this volume).

EARLY CLASSIC PERIOD OCCUPATION IN THE VALLEY BOTTOM

As expected, the increased population throughout the pre-Classic period resulted in an increase in the number of habitations in the valley bottom during the following Classic period. Previously unoccupied locations were settled, and at least eight habitation areas are present in the valley bottom that were occupied between A.D. 1150 and 1250. These include possible compounds that are evident as multi-room surface structures, as well as multiple, partially-exposed, cobble-masonry rooms in areas up to 2,500 square meters in size (see Figure 4). The probable compound areas contain multiple rooms, multiple wall alignments, and diverse, dense scatters of sherds, flaked stone, and occasional ground stone. Two of these habitation areas are located on benches, a moderate distance east of Stone Camp East, on the east side of Roundtree Canyon, while five—including at least two possible compounds—are located in the valley bottom near to Stone Camp Pueblo, on the west side of Roundtree Canyon. The final habitation area is adjacent to CP Butte Ruin.

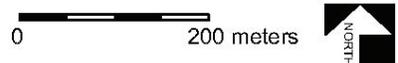
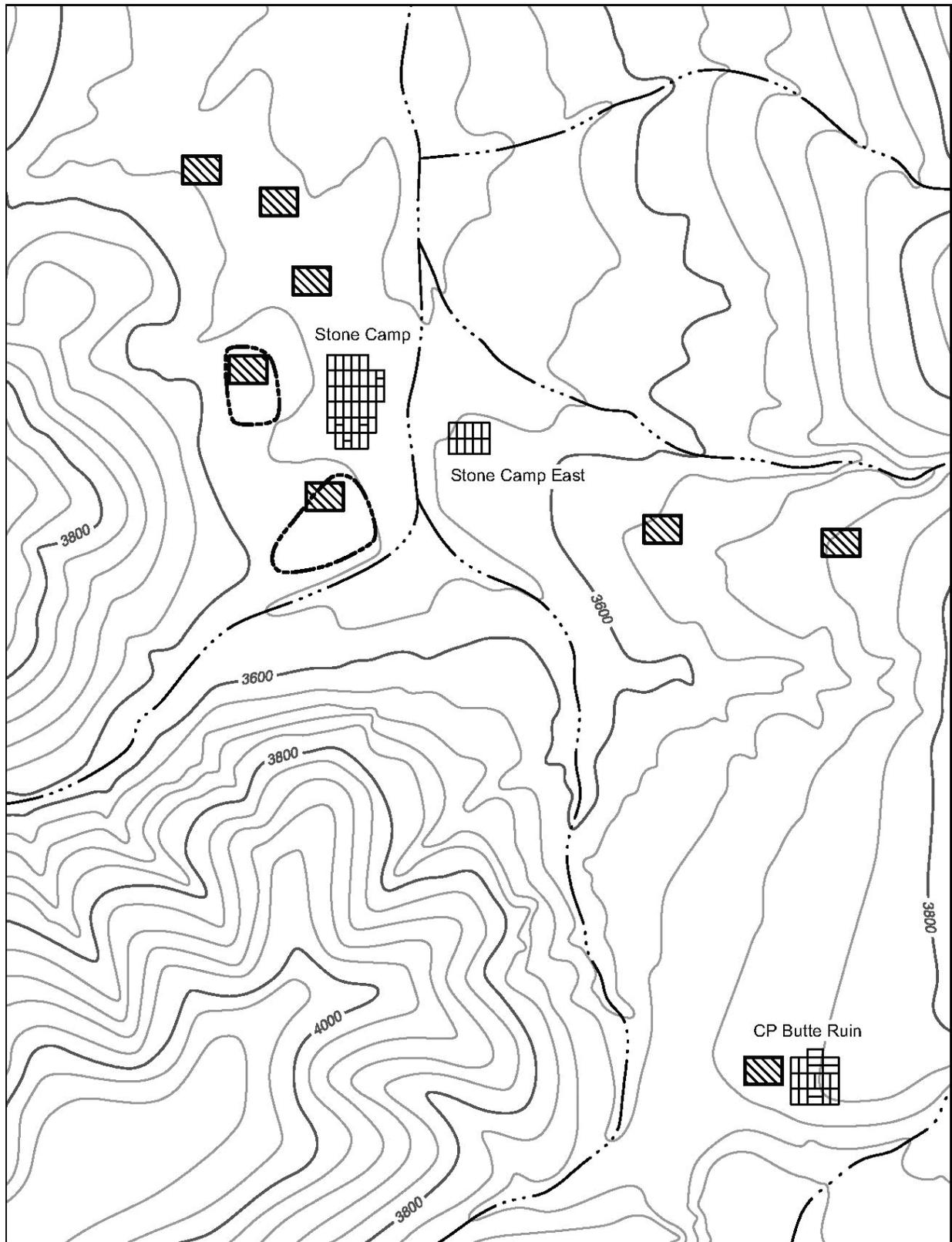


Figure 4. Map Showing the Two Pre-Classic Habitation Areas and the Early Classic Period Habitations in Relation to Stone Camp Pueblo, Stone Camp East, and CP Butte Ruin.

I have not yet attempted to map or record in detail these extensive habitation areas. Although these are not easily defined, because of vegetation and erosion, I am confident some may represent compounds, based on the dense artifact scatters that are present, as well as the lengths and orientations of the rock alignments. The Roadhouse Ruin, a Classic period compound along the Verde River, in the Horseshoe Basin, measured nearly 100 m long and contained contiguous, single-room courtyard units, bounded by masonry walls, and at least 13 roofed structures (Klucas et al. 1997:505, 508). Although this was crossed by an unpaved road, much of the compound was only visible on the surface as wall outlines and small areas of basalt rubble (Neily 1998:133).

A wide variety of sand-tempered, plainware sherds was observed at all of the suspected compounds, and phyllite-tempered, plainware sherds were noted at three of the eight suspected habitations; diagnostic sherds are limited to a very small amount of Tusayan White Ware. Although not directly associated with a known compound, Winslow Polychrome (A.D. 1260–1350; Hays-Gilpin and van Hartesveldt 1998) was identified around Stone Camp Pueblo and may be evidence of earlier Classic period features that are now obscured by the later occupation. In addition, Winslow Black-on-orange was noted downstream from Stone Camp Pueblo, near Stone Camp Spring and in a dense juniper forest that is likely obscuring features.

The valley bottom contains a substantial number of surface structures, with many concentrated around Stone Camp Pueblo. A number of these are in small groups (clusters) that occur near the pre-Classic and Classic period habitations. Although construction of small surface structures in the valley bottom was not as prevalent as on the upland ridges (a total of 54 are known in the valley bottom and 107 on the upland ridges), many of those in the valley bottom are in habitation areas and are accompanied by substantial artifact scatters (Figure 5). Seventeen of the sites with surface structures were recorded in detail during this project, and sand-tempered, plainware sherds occurred at all of these, whereas phyllite-tempered, plainware sherds were noted at 15 of the sites. The presence of phyllite-tempered, plainware sherds may be evidence that the construction of these types of features began in the late pre-Classic period (Wood this volume) and early Classic period (see Abbott and Lack this volume; Marshall 2004; Bruder 1982). A majority of the valley bottom surface structures are grouped in clusters on the same low rise that contains Stone Camp Pueblo, and immediately west and south of Stone Camp Pueblo, on higher benches that have a substantial pre-Classic occupation. Each cluster contains one to three multi-room structures and closely-spaced, one-room structures generally separated by 10 to 30 m. Surface structures within the northern extreme of the valley bottom, well north of Stone Camp

Pueblo but in areas of suspected compounds, are more widely spaced, and include one- and two-room structures that are spaced 120 to 170 m apart; I do not believe these served as permanent habitations, based on the paucity of artifacts.

Of the 54 surface structures in the valley bottom, 45 have only one room, eight have two rooms, and one has more than three rooms. A majority of these are in close proximity to Stone Camp Pueblo and Stone Camp East. Based on the types and quantities of artifacts, I suggest that many of the multi-room structures represent habitations. The remaining structures are located between Stone Camp East and CP Butte Ruin, near the north end of the valley bottom where Roundtree Canyon enters a narrow canyon. I suspect that the small surface structures, located at a distance from the large room blocks, do not represent habitations, but more likely served as field houses, as they contain relatively small quantities of artifacts. Forty of these structures occur on the west side of Roundtree Canyon, in locations with Classic period habitations (including suspected compounds) and Pre-Classic artifact scatters with likely pit houses. Sixteen of the one-room structures are simple rock outlines with no wall rubble, and 28 are structures with pronounced mounds of wall fall. Most of the structures recorded in detail are rectangular, with three that are square, and two that are sub-square. The square one-room structures range from 3 by 3 m to 5 by 5 m in size, while rectangular structures range from 2 by 3 m to 4 by 8 m in size. Five of the 11 structures recorded in detail have full-height masonry walls with rubble mounds that extend up to 1 m high. All of the multi-room structures are full-height masonry except for one that is suspected to contain four rooms, outlined in rock, which may be part of a compound.

LATE CLASSIC PERIOD OCCUPATION IN THE VALLEY BOTTOM

The most imposing of the late thirteenth and fourteenth century masonry structures are the three aggregated room blocks: Stone Camp Pueblo, Stone Camp East, and CP Butte Ruin. Stone Camp Pueblo is a 50 m by 40 m, north-south-oriented room block with 45 rooms, located at the edge of a low ridge, above Roundtree Canyon. A broad area, likely representing an open plaza, adjoins it to the west. Situated immediately across Roundtree Canyon, Stone Camp East is a smaller room block with 10 rooms, and which was likely occupied contemporaneously with Stone Camp Pueblo. CP Butte Ruin is located at the divide between Roundtree Creek and Lime Creek. It consists of an east-west-oriented room block, with approximately 20 rooms and an adjoining, walled compound/enclosed plaza, and it may represent an early Classic period component. The slope on the north side of CP Butte Ruin also contains suspected agricultural features. The three room blocks were likely

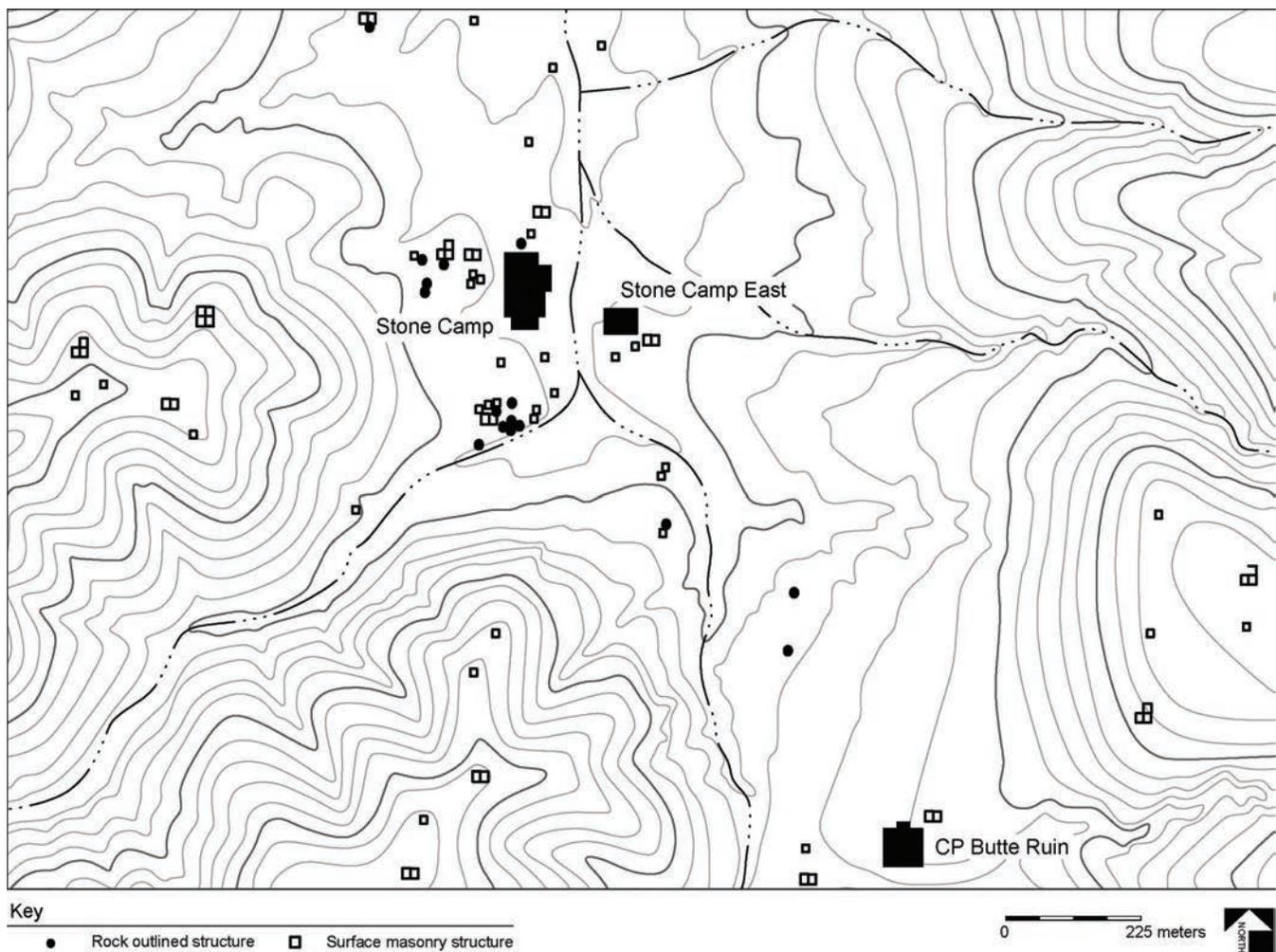


Figure 5. Map Showing the Distribution of Rock Outlined Structures and Surface Structures in the Valley Bottom.

occupied contemporaneously, at least after A.D. 1300, based on the presence of Jeddito Yellow Ware (Hays 1991) and Gila Polychrome ceramics (Table 2). Other diagnostic ceramics from the large room blocks and the Classic period are presented in Table 2 and include Little Colorado White Ware, Roosevelt Red Ware, and White Mountain Red Ware. I found no clear ceramic evidence, such as Tonto Polychrome or Four Mile Polychrome, to suggest that the Classic period occupation of the community persisted into the late A.D. 1300s or 1400s.

Table 2. Diagnostic Ceramics of the Classic Period.

Walnut Black-on-white	A.D. 1100–1250
Winslow Orangeware	A.D. 1260–1350
Salado White-on-red	A.D. 1200–1350
White Mountain Red Ware	A.D. 1175–1400
Jeddito Black-on-yellow	A.D. 1300/1325–1400+
Gila Polychrome	A.D. 1300–1400

Hays 1991; Hays-Gilpin and van Hartesveldt 1998; Museum of Northern Arizona 2005; and Wood 1987

LATE CLASSIC PERIOD LAND USE OF THE UPLAND RIDGES

The upland ridges contain a late Classic period land use pattern differing from that of the Pre-Classic and Early Classic periods. Over 100 surface structures are present in this previously-unoccupied area. I suspect most of these date to the late-thirteenth and fourteenth centuries based on the detailed recording of 36 of the sites and survey-level observations made at the remaining sites. Each site is defined solely by the presence of surface architecture; no structures that could be attributed to the pre-Classic period are present on the upland ridges. Although no ceramics were observed at 60 of the structures, sand-tempered, plainware pottery is most abundant at those sites with ceramics (see Abbott and Wood, this volume), with small quantities of phyllite-tempered plainware pottery noted at eight of the sites, and redware sherds (mostly sand-tempered) at five of the upland sites. Decorated sherds are extremely scarce, limited to a single Jeddito Black-on-yellow sherd (A.D. 1300/1325–post 1400) at a site on the east upland ridge, and a single Tusayan White Ware sherd at a site

on the west upland ridge. Both of these sites contained over 100 sherds, considerably more than all the other upland ridge sites. I suspect that these two sites represent locations that were used over longer periods of time, but do not represent permanent habitations.

These small surface structures are distributed across the upland ridges, but tend to concentrate on the colluvial gravel and cobble ridges on the west side of the valley. Approximately 75 of the structures are of a single room, and most have low masonry walls that were likely foundations for upper walls of jacal. Also present are 19 two-room structures, five three-room structures, and two four-room structures with occasional wing walls and partially-enclosed spaces. Nineteen of the structures have probable full-height masonry walls, with rubble mounds over 40 cm high. The density of these masonry structures on the upland ridges, including the narrow, sloping finger ridges, is remarkable, with many structures separated by distances of less than 50 m (see Figure 2).

THE FUNCTION OF SMALL STRUCTURES ON THE LANDSCAPE

I theorize that the construction of the closely-spaced surface structures, primarily on the upland finger ridges, represents visual land-use claims by small household groups to adjoining or nearby agricultural fields. The distribution of surface-masonry structures in the upland ridges of the Stone Camp Community presents a unique opportunity to evaluate land use in this portion of central Arizona, and how it was influenced by population aggregation during the Classic period. I have demonstrated that the valley bottom was the focal residential area, and was seemingly inhabited over a 600-year period beginning with pit house settlements as early as A.D. 800. Settlement and land use culminated in the Classic period, with the construction of multi-room pueblos and over 50 surface-masonry structures.

The valley bottom had limited areas of alluvium for overbank floodwater farming, but this may have been sufficient to support the expected, smaller population. The only two recognized dry land farming areas consist of ephemeral rock alignments and possible terraces that were established on the broad slopes in the valley bottom, south and east of Stone Camp East and north of CP Butte Ruin, in locations relatively devoid of habitation loci. No recognizable dry land farming areas have been identified in any other locations within the study area, including the upland ridges, where settlement during the Classic period was greatly intensified.

The upland finger ridges are peripheral to the densely occupied valley bottom, and there is no evidence of land use during the pre-Classic period. The smaller population of the pre-Classic period was likely sustained by the floodwater agricultural production in the valley proper. Thus, it was not necessary to traverse

the steep, 200-m-high slopes to undertake dry farming on the ridges. In contrast, the agricultural economy during the Classic period appears to have been focused on dry land agricultural production in the upland ridges. The dry land agriculture may have focused on the cultivation of maize and other cultigens, as there is no evidence of agave cultivation (e.g., rock piles) or processing (e.g., fire-cracked rock, slag, mounded roasting pits) at any of these upland sites. It should be noted, however, that the Apache were reported to carry agave up to one mile for roasting (Ferg 2003:7), and agave does occur naturally in the study area.

The agricultural expansion onto the previously-unoccupied upland ridges, beginning in the Classic period, was a multifaceted response to changing environmental conditions which occurred throughout the region (Bruder 1982; Dean 2000; Kruse-Peeples and Strawhacker 2012; Van West and Altschul 1997:349; Whittlesey et al. 1997). More importantly, it provided a means for mitigating social conflict over diminishing agricultural land resulting from internal population growth and immigration of disparate kin groups into the area. During the Classic period, the upland finger ridges in the Stone Camp Community witnessed a remarkable increase in use, as over 100 surface structures were constructed.

All of these upland structures lack evidence of long-term habitation, and are associated with very small quantities of plainware sherds (if any at all) and, occasionally, ground stone. In this regard, the Stone Camp example is similar to a Perry Mesa model of dispersed use of field houses, in which temporary structures are used over several years, but not permanently occupied, and are related to large, permanent settlements (Kruse-Peeples and Strawhacker 2012:270–275). Kruse-Peeples and Strawhacker (2012) argue that the function of the smaller structures is not always clear, but that they likely served an important role in the agricultural land use strategy. The location of the small structures was also influenced by benefits gained from reducing transportation costs between the residences and fields (Kruse-Peeples and Strawhacker 2012:271; Preucel 1990; Woodbury 1961). Based on relative proximity, land tenure of the agricultural fields on the northernmost finger ridge were likely maintained by domestic groups residing at Stone Camp Pueblo and possibly Stone Camp East, whereas property rights of field houses and associated agricultural fields on the southernmost finger ridges were likely asserted by the inhabitants of CP Butte Ruin.

Admittedly, I have very little ceramic evidence (the exception is a single Jeddito Black-on-yellow sherd) to indicate the upland ridges were occupied during the Classic period. However, similar sites lacking ceramics have been attributed to the early Classic period on Perry Mesa, along Cave Creek, and in the Tonto Basin (Bruder 1982; Oliver 1997; Wood, this volume). Phyllite-tempered, plainware sherds, at structures within five of the 18 clusters on the southernmost upland ridges and the

eastern upland ridge, may be evidence of social groups that were based in the valley bottom and that expanded their range to the upland ridges in the early Classic period. Architecturally, the surface structures are either rock-outlined rooms that represent low masonry foundations (that supported upper jacal walls), or mounded rubble that likely represent rooms constructed with full-height masonry walls. Some of these have wing walls that partially enclose an unroofed activity area. These are commonly a single room, but some structures contain up to three rooms.

The upland finger ridges that were the location of this Classic-period intensification are approximately 120 m (400 ft) above the valley bottom. Although the slopes are steep, they lack bedrock exposures or vertical cliff faces that could be effectively used in a defensive posture. The structures were built on the level ridge tops, along the gently sloping sides, along the narrow finger ridges, and often on slightly elevated terrain. Although these structures were in locations that afforded a broad view of the surrounding terrain, individually they were constructed in a location with a restricted view shed and would not have been effective defensive positions.

THE AGRICULTURAL FIELD

An important component of my argument for land tenure practices is the concept of an agricultural field. These are not always readily apparent, and often the characterization of an area as an agricultural field is based on an absence of artifacts and features such as field houses. An agricultural field is not defined solely by the presence of rock features (such as rock alignments, terraces, or rock piles), as perishable materials were also used. Estimates of arable land within an area must also take into consideration appropriate landforms and soils (see Van West and Altschul 1997:349). The main challenge of growing crops in locations such as the upland ridges would be the unpredictability of water. These areas were likely used for the cultivation of corn and other domesticates, but may have been used for cultivating drought-tolerant crops such as agave (even though no agricultural rock piles were identified). Van West and Altschul (1997:349) theorize that agricultural development of upland settings was in response to population growth, environmental uncertainties, or loss of agricultural land late in the prehistoric sequence. Farmers in the Horseshoe Basin diversified field locations and farming methods during periods of high moisture, when upland agriculture would have been very successful (although their models showed that nonirrigated agriculture had only a 46 percent success rate during the early Classic period) (Van West and Altschul 1997:369–372).

Although no studies of soil fertility or water-holding capacity have been conducted in the project area, it is expected that the numerous structures were established to support the dry land agricultural economy

and that, at least in the short term, it proved sufficient to support the Classic-period population in the valley bottom below. Castetter and Bell (1942:54) suggested that irrigated Pima farms that were from 0.86 to 2.15 ha in size supported a family of five for one year. Upland settings in the Horseshoe Basin projected a yield of six bushels of maize per 0.4 ha of dry land farming (Van West and Altschul 1997:355). The abundance of south-facing slopes—which receive up to six times more solar radiation than north-facing slopes (Auslander et al. 2003)—may have also provided for longer growing seasons in these higher-elevation locations where the growing season is from 200 to 220 days (University of Arizona 2013).

LAND TENURE ON THE UPLAND RIDGES

The increased population during the Classic period prompted the residents of the Stone Camp Community to modify previous forms of land tenure in the settlement system. This is represented in the study area by clusters of surface structures that form visual land-use claims. Using ethnographic examples in the following paragraphs, it seems likely that restricted forms of land tenure probably characterized the settlement system. Based on those examples and archaeological data, I propose that the patterned distribution of surface structures on the upland ridges represents heritable household land tenure units (Earle 2000; McAnany 1995, 1998) that are referred to here as Tenure Clusters (Table 3).

Land tenure is a strategy in which individuals or groups define a relationship and agree how land use is regulated (Food and Agricultural Organization of the United Nations 2013). Land tenure also encompasses the conceptualized and practiced rights and privileges that social entities use to claim and protect resources from others (Adler 1996:337–338; Carrier 1998; Hann 1998:7). Put simply, land tenure systems dictate the duration of land use by select groups over a given period of time. The type of land tenure system that may exist within a given area is dictated by the population size and the relationships that exist between groups within the community.

Heritable land tenure is defined by familial or small-group ownership (Schriever 2012) and is often represented by superpositioning among structures, evidence of remodeling, and clusters of temporally sequential clusters that assert a social group's relationship to land or resources (Earle 2000; McAnany 1995, 1998). Ethnographically, Hopi, Tohono O'odham, and Zuni farmers continued to maintain individual, household level access to agricultural plots (Adler 1994). Further, it has been noted that the Hopi risked crop shortages when more than six households were granted access to communal agricultural lands (Hegmon 1989).

Table 3. Upland Tenure Clusters of the Stone Camp Community.

Tenure Cluster No.	Hectares	Dimensions	Total no. structures	No. hectares per structure	1 room structure	2 room structures	3 room structures	4 room structures	Full-height walls
1	0.3	100 x 40	2	0.2	2	–	–	–	1
2	1.1	240 x 60	4	0.4	1	2	–	–	3
3	1.3	170 x 100	4	0.3	3	–	1	–	1
4	3.4	280 x 180	14	0.2	11	1	–	1	3
5	4.2	280 x 190	10	0.4	9	1	–	–	2
6	1.0	140 x 90	7	0.1	6	1	–	–	1
7	1.7	400 x 40	5	0.4	2	3	–	–	–
8	0.2	80 x 30	2	0.1	2	–	–	–	–
9	0.3	100 x 30	2	0.2	1	1	–	–	1
10	0.5	110 x 40	2	0.2	1	1	–	–	–
11	1.6	330 x 40	8	0.2	6	2	–	–	1
12	2.9	400 x 90	11	0.2	10	1	–	–	–
13	0.8	290 x 30	5	0.2	5	–	–	–	–
14	1.7	330 x 60	8	0.2	7	1	–	–	2
15	0.5	110 x 50	2	0.2	–	2	–	–	–
16	1.6	250 x 80	4	0.4	2	2	–	–	1
17	0.7	110 x 80	3	0.2	2	–	1	–	–
18	0.4	100 x 50	2	0.2	1	1	–	–	–
19	0.6	160 x 40	2	0.3	1	–	1	–	1
20	.4	120 x 40	2	0.2	1	–	1	–	1
total			99		73	19	4	1	18

Communal, or usufruct land tenure (Schriever 2012), is defined by flexible land ownership under control of a larger social group and does not reflect a household level of maintaining land or resources. Communal land tenure systems are often larger and lack features that would serve to “claim” a resource or an area. This form of land tenure is common when more than 20 households are present (Adler 1994: 86).

The aggregated room blocks in the Stone Camp Community contain 12 to 45 rooms (an estimated 4 to 15 households). The 20 Tenure Clusters, as presently defined, contain closely-spaced, one-room surface masonry structures associated with multi-room structures or clusters of one-room structures (Figure 6). These are separated by areas measuring at least 140 m long, which lack masonry structures. The Clusters range from 0.2 to 4.2 ha (0.5 to 10.3 ac) (with a mean of 3.6 ac) and average one surface-masonry structure every 0.2 ha (0.6 ac). Although the number of structures varies per cluster, only five Tenure Clusters have structure densities nearing one per acre. The distance between masonry structures within each Tenure Cluster ranges from 10 to 80 m on the level ridge tops, and from 50 to 130 m along the narrow finger ridges. The areas between Tenure Clusters range in size from less

than 2 ha (5 ac) to over 4 ha (10 ac). I propose that these areas would have provided ample space for dry farming crops.

All of the Tenure Clusters contain one to 10 one-room structures. Further, all but two of the proposed Tenure Clusters contain at least one multi-room structure or clusters of two to three one-room structures spaced less than 5 m apart. Full-height wall masonry structures were identified in 12 of the Tenure Clusters, and only one two-room structure, on the central western upland ridge, contains over 100 sherds (including the only whiteware sherd on the upland ridges). Outlying structures that do not form a Tenure Cluster are limited to the periphery of the upland ridges, but also occur in areas that were not intensively surveyed during our investigations. These include a three-room structure at the base of a finger ridge overlooking CP Butte Ruin, and four one-room structures on the extreme western end of the western upland ridge.

The spatial patterning of these upland ridge structures is more understandable if they were used, in part, to exert a visual ownership over nearby fields under their control. Regardless of the use-life of masonry/jacal and masonry structures, the extensive distribution and close spacing of the structures across the upland

landscape is redundant, if indeed the structures represent agricultural field houses. The abundance of small structures, especially the one-room structures, may be an indicator of land tenure ownership of the upland agricultural fields that were maintained by separate domestic groups. Similarly, larger kin or corporate groups that cooperated in agricultural production and distribution might be represented by core structures that consist of the larger two- to four-room structures, or by the observed spatial clustering of field houses. These core structures are generally located along the perimeter of the Tenure Cluster, but the reason for this positioning is not currently known (Figure 7). As the

primary form of land tenure within the community, they would also have been responsible for regulating the construction and location of other clusters, owned by other domestic groups using the ridges. Some of the core structures may have been constructed during the early Classic period (based on the presence of phyllite-tempered plainware sherds) and maintained by subsequent generations. Evidence of remodeling of structures within the Tenure Clusters was not apparent during this study. It is possible that multi-room structures began as one-room structures and expanded through accretion as each Tenure Cluster grew during the mid to late Classic period.

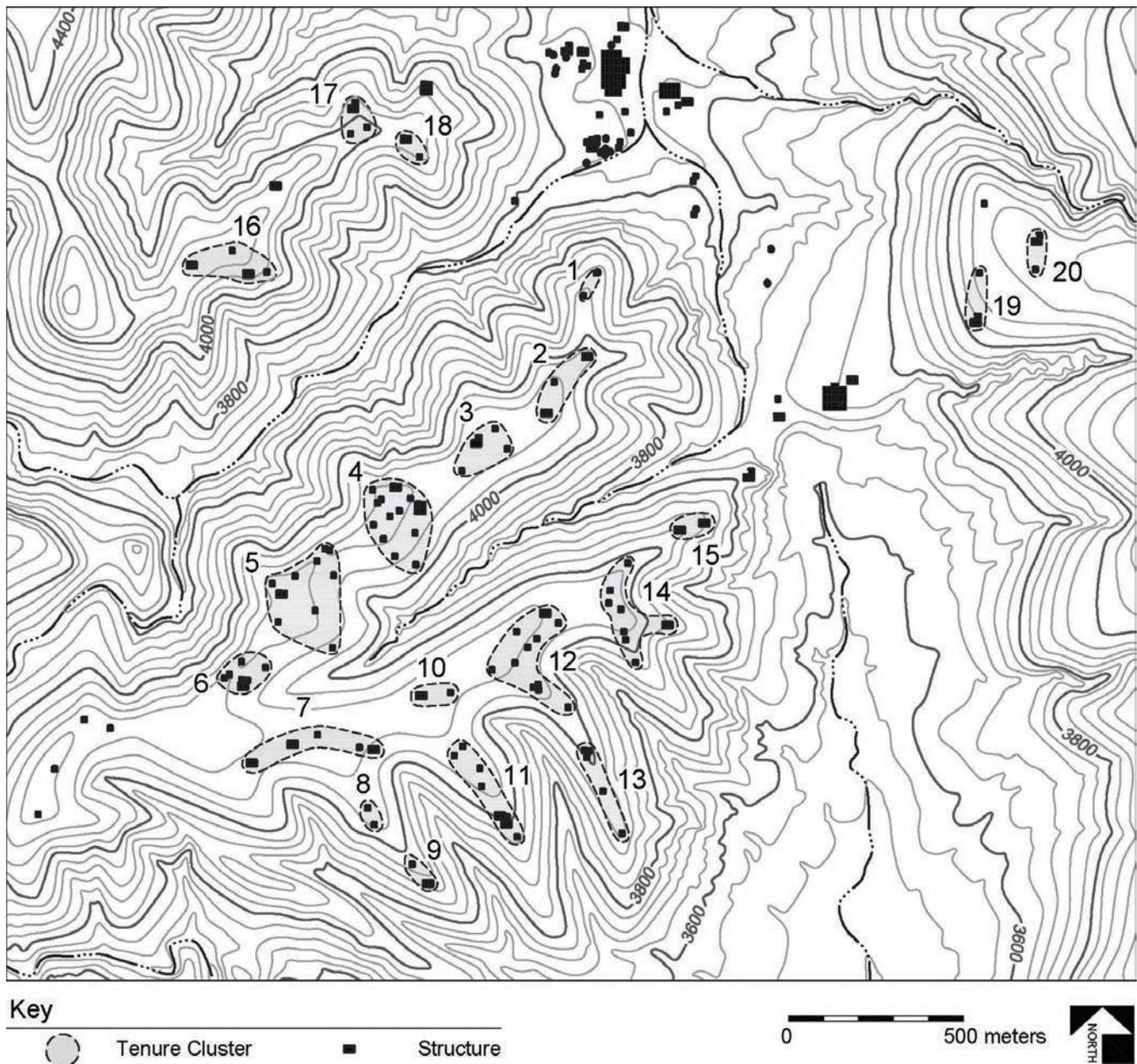


Figure 6. Map Showing Tenure Clusters and Distribution of Surface Masonry Structures on the Upland Ridges.

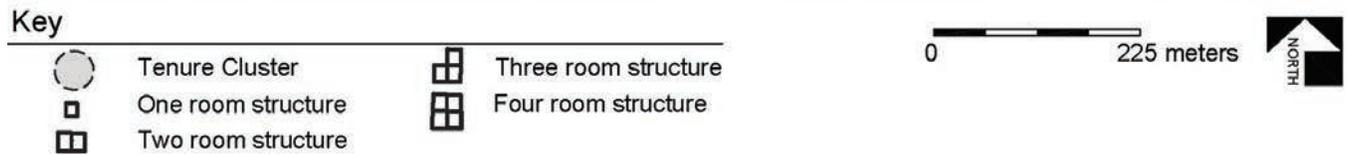
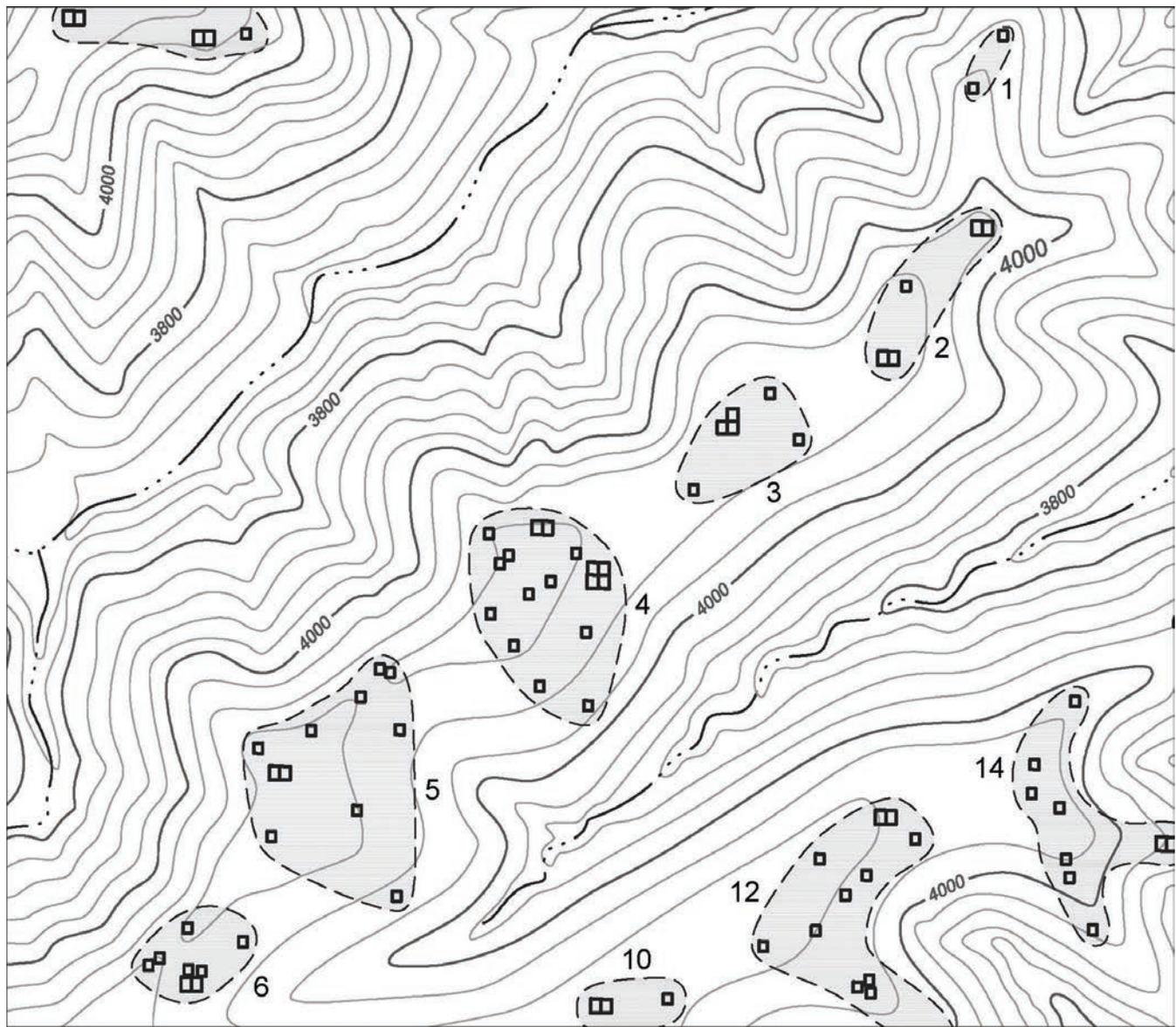


Figure 7. Map Showing Proposed Tenure Clusters on the Western Upland Ridge Top.

SUMMARY

This multi-year study of the Stone Camp Community has revealed a unique settlement in the uplands of Central Arizona, between the Verde River and Perry Mesa. It is unprecedented because the survey encompassed a large block area in a location that has never been studied, all of the structures were documented minimally with a GPS, and basic architectural and artifactual information was obtained for every structure. Detailed recording of 36 percent of the structures

within the community also included sketch maps and controlled sample artifact analyses. One of the more interesting aspects is the community's association with a previously-unidentified source of a distinctive dacite, with a limited distribution throughout the region (Courtright and Neily 2012), but which is not discussed here. This detailed recording has allowed me to characterize the temporal patterning and development of the Stone Camp Community, and it provided data to support my hypothesis on the likely tenure patterns of agricultural land use during the Classic period

In many ways, the settlement patterns evident within the Stone Camp Community are similar to other nearby settlement clusters in the Transition Zone, including Bloody Basin, the Middle Verde River, Perry Mesa, the Payson Basin, Tonto Basin, and Hackberry Basin (Ahlstrom and Roberts 1995; Graceffa 2012; Macnider and Effland 1989; Oliver 1997; Redman and Hohmann 1986; Whittlesey et al. 1997; Wilcox and Holmlund 2007). In these locales, aggregated, Classic period populations were established around large, multi-room structures and supported by peripheral agricultural areas containing large numbers of surface masonry field structures. This settlement pattern is also evident on the Colorado Plateau (Pilles 1978; Downum and Sullivan 1998). The field house structures in the Stone Camp Community exhibit a wide range of shapes and sizes, but are similar to those reported elsewhere in the Transition Zone (Crary 1991).

Tenure Clusters, as the highly patterned land tenure units in the upland ridges of the Stone Camp Community, are posited to be a response to the increased agricultural needs of a quickly growing community during the Classic period. Agricultural land in the valley bottom was limited, but was sufficient to have supported the smaller population during the pre-Classic period. The valley bottom agricultural areas would not have sustained a demographic increase that likely occurred during the Classic period. The agricultural economy instead was focused on dry land agricultural production on the upland ridges. The potential arable land on the ridge tops and finger ridges is over 74 ha (183 ac), more than enough, given adequate environmental conditions for dry farming, to support a growing population.

The Tenure Clusters were likely started by established households or residential groups living in the valley bottom. The most suitable agricultural land on the ridge tops may have been claimed early. This interpretation is based on the presence of phyllite-tempered, plainware sherds at five Tenure Clusters, located on the broadest parts of the western upland ridges, as well as one Tenure Cluster on the eastern upland ridge. As the population and agricultural demands increased, the Tenure Clusters and agricultural fields may have expanded onto the narrow, western upland ridge north of Holmes Canyon, and the narrow tops of the southern finger ridges (Figure 8). Broad expansion onto the eastern upland ridge, however, did not occur, and was likely a result of less desirable agricultural soils in this basalt covered, upland ridge location. Each Tenure Cluster also contains one or more core structures that would have regulated the construction and location of other structures within the Cluster, and that would have been responsible for monitoring adjacent agricultural fields.

The heritable land tenure units that are proposed in this article provide a baseline for comparing how

large communities, such as those at nearby Perry Mesa, Horseshoe Basin, and along the Lower Verde River, may have adapted to rapid population increases during the Classic period. Over the decades, 5,200 ha (13,000 ac) of Perry Mesa have been systematically surveyed and over 670 sites have been reported (Gummerman et al. 1975; Kruse-Peebles and Strawhacker 2012; Kruse-Peebles et al. 2009; North 2002; Wilcox and Holmlund 2007). Although these data are summarized from projects compiled over a 30-year period (Kruse-Peebles and Strawhacker 2012), it has not been analyzed in detail, and the various methods used to record sites over the years may not allow researchers to identify architectural or artifactual trends. It should be noted that these studies have reported a more substantial pre-Classic period occupation (North 2002; Kruse-Peebles and Strawhacker 2012; Wood, this volume) that mirrors the development of the Stone Camp Community.

It is well documented that large pueblos on the broad, generally-level top of Perry Mesa are surrounded by contemporaneous, smaller masonry structures, extensive agricultural fields, and resource procurement areas (Ahlstrom and Roberts 1995; Kruse-Peebles et al. 2009; and Kruse-Peebles and Strawhacker 2012). The Stone Camp Community, however, is in a much different geologic setting that provides a unique view of residential and agricultural expansion within a relatively confined area, which is defined by unique upland ridges, separated from habitation areas in the valley bottom. The intensive survey of a block area, however, has allowed me to define an entire settlement system and associated land use patterns.

The presence of land tenure units in areas such as Perry Mesa will only be identified once data from large block surveys—in locations away from residential areas—are closely analyzed. This can be accomplished by evaluating intra- and inter-spatial relationships of single- and multi-room structures. Another avenue is to analyze the types and frequencies of plainware and nonlocal, diagnostic ceramics. The parameters of what constitutes a tenure cluster will vary considerably on Perry Mesa from what has been identified at Stone Camp, because the tenure clusters at Stone Camp are located within unique, constrained landforms that are very clearly separated from the residential areas in the valley bottom. Although many smaller, non-residential structures are present in the valley bottom of the Stone Camp community, no evidence of land tenure units (such as clustering of single- and multi-room surface structures) has yet been identified. I suggest that similar tenure cluster on Perry Mesa, if present, were established across much larger areas, and may have been part of later, more sophisticated forms of land tenure (similar to Kruse-Peebles and Strawhacker's [2012] Model 3), which evolved as the increasing population adapted to the community needs for agricultural land.

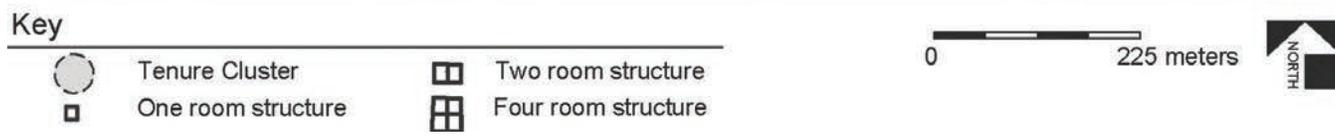
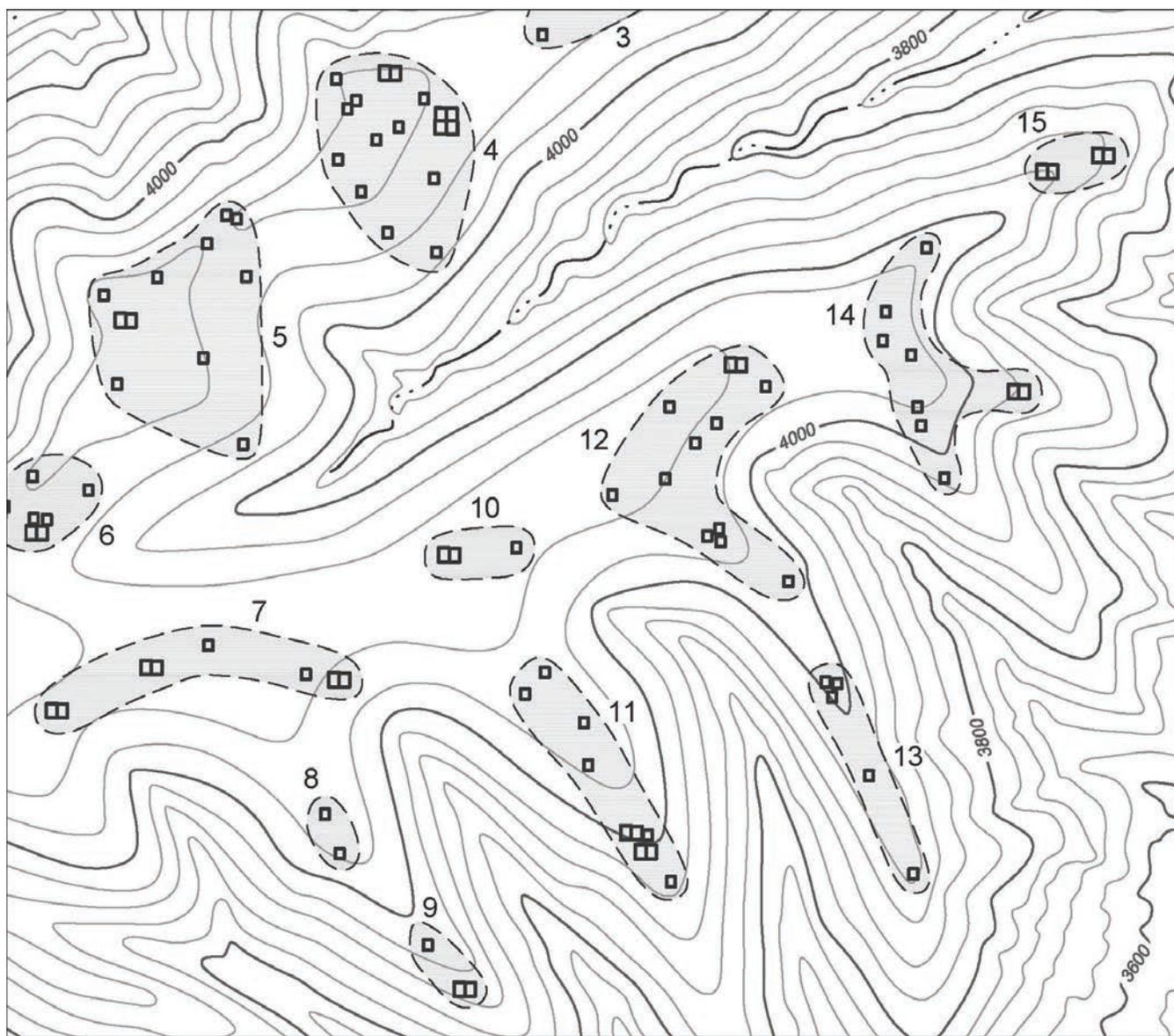


Figure 8. Map Showing Proposed Tenure Clusters on the Southern Upland Finger Ridges.

Soil fertility and moisture retainment studies for the upland ridges of the Stone Camp Community may also reveal the true agricultural potential of this area. I may be able to determine the absolute age of most of the non-descript structures on the ridge tops with the collection of samples for absolute dating from excavated contexts. At present, I can only use available plainware ceramic data to make inferences about the settlement history of the upland ridgetops. The land use on the upland ridges of the Stone Camp Community, however, does indicate the development of a distinctive pattern of land-tenure during the Classic period in this part of the Transition Zone.

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UPHILL ALL THE WAY: DEDUCTIVE AND INDUCTIVE REASONING ON A LONELY HILLTOP SOMEWHERE IN ARIZONA

Will G. Russell

ABSTRACT

The Horseshoe Butte site is perched atop a steep hill of the same name, separated from Perry Mesa by the Agua Fria River. There has been no excavation here, and few archaeologists have actually visited the site. Nevertheless, the available data from Horseshoe Butte have been interpreted in remarkably different ways. More specifically, one project has described a prehispanic signaling station, critical to the success of a massive political confederacy. Another project has described a defensive refuge, built and used periodically by mobile Yavapai or Apache groups during the late nineteenth century. While acknowledging that the two interpretations are not mutually exclusive, I argue in this paper that extant evidence does not support an inference of sustained or intensive prehispanic occupation. Furthermore, I suggest that Yavapai and Apache sites may be going unrecognized not only because of their typically ephemeral nature, but due also to the misconception that they are always ephemeral.

INTRODUCTION

An impressive number of hills in north-central Arizona are topped with archaeological features, many of which include formidable walls or breastworks. Evidence suggests that many of these “hilltop forts” are prehispanic, defensive sites (e.g., Austin ca. 1980, 2000; Crary 1991; Crary et al. 1992; Hoffman 1996; Spoerl 1979; van Waarden 1984; Wilcox and Holmlund 2007; Wilcox et al. 2007; Wilcox et al. 2001a, 2001b; see also Watkins 2016). This interpretation, however, should not be a foregone conclusion from which further inferences are drawn. With the region’s unprecedented scale of cultural transformation, demographic movement, and social diversity between 1150 and 1900 CE, understanding better how these sites articulate with the social landscape, both individually and collectively, is critical to our interpretations of past practice and social organization.

RENEWED INTEREST IN THE HORSESHOE HILLS

The present paper focuses on a particular hilltop site near Perry Mesa. Despite its modest size and relative obscurity, the Horseshoe Butte site (NA25,985) has emerged as a key contributor in efforts to understand landscape use and Indigenous social organization in north-central Arizona. The site plays a central role – both literally and figuratively – in an ambitious hypothesis concerning regional warfare and political alliance in and around the fourteenth century. Not all researchers, however, are in agreement as to the dating and nature of the site’s primary occupation.

In 2011, I and others argued that the Horseshoe Butte site’s architecture dated to the nineteenth century. The delivery of this reinterpretation, which ranged from irreverent (Russell et al. 2012) to confrontational (Russell et al. 2011, as delivered by a co-author), was unnecessarily dichotomous. While I remain convinced that the site’s architecture and principal occupation date to historic times, I tend now to agree with Watkins (2016) that the evidence from Horseshoe Butte reflects more upon the Verde Confederacy’s proposed scale and degree of commitment, than its legitimacy as an explanatory model. While I cannot argue that the hilltop was never used for prehispanic signaling, I do suggest that it is unlikely to have filled a permanent, provisioned, and continuously-staffed position, upon which an ever-vigilant infrastructure relied.

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THE PREHISPANIC LOOKOUT INTERPRETATION

In 2001, a novel socio-political model was offered to explain settlement patterns and demographic change in north-central Arizona during the thirteenth and fourteenth centuries (Wilcox et al. 2001a, 2001b; Wilcox et al. 2007; see also Wilcox 2005; Wilcox and Holmlund 2007; Wilcox et al. 2008). Central to this model is an immense, pan-regional network – the Verde Confederacy – committed to mutual defense against common enemies. As conceptualized, the Confederacy was isolated from hostile forces to the northeast and the south by evacuated buffer zones (Wilcox et al. 2001b:158). Much of the Confederacy was positioned along the Verde River, stretching between Perkinsville and Davenport Wash (Wilcox et al. 2001b:158). Perry Mesa, to the west, was recognized as a weak spot for the Confederacy, a sparsely-inhabited back door through which an army of Hohokam warriors could enter with little resistance. The solution, according to the model, was to strategically deploy groups to Perry Mesa, where a “castle defense” system could be installed along cliff edges to protect the Confederacy’s western flank (Wilcox et al. 2001b:167-168).

The Verde Confederacy was described as a “political relationship among six or seven more or less distinct settlement systems that shared in a conflict relationship with the Phoenix Basin Hohokam, and perhaps with other neighboring groups” (Wilcox et al. 2007:204; see also Wilcox et al. 2001a). All told, it is envisioned as covering over 5,000 km², including hundreds of settlements and over 10,000 people (Wilcox et al. 2001b:Table 7.2, 160-161; see maps in Abbott and Lack, this issue). Such a far-reaching and complex arrangement, structured to address imminent attack, would require rapid, dependable, and sustained communication (Wilcox and Holmlund 2007:19; Wilcox et al. 2001b:149, 155; Wilcox et al. 2007:200). The foundation of this early warning system was a network of hilltop signaling outposts with line-of-sight relationships (Wilcox et al. 2001a, 2001b; Wilcox et al. 2007; Wilcox et al. 2008; cf. Austin 1980, 2000).

In developing the communications component of their model, the Verde Confederacy group began recording a series of prehispanic hilltop sites throughout the region (Wilcox and Holmlund 2007:21-38; Wilcox et al. 2007:200; Wilcox et al. 2008). The Hilltop Survey project, as it came to be known, took a decidedly deductive approach: “We began postulating where ‘missing nodes’ in the communication network should be and finding they were there” (Wilcox et al. 2007:200). Reports were completed after each survey trip, and these were filed with the Museum of Northern Arizona (Wilcox et al. 2007:201). While I reference observations and methodologies described in these reports (Museum of Northern Arizona 1999), early inferences contained therein are omitted.

As the envisaged line-of-sight network grew, project members realized that it lacked a central node which would bridge two otherwise-unconnected clusters. Should such a lookout exist, it would have to be high up and somewhere near Cordes Junction (Wilcox et al. 2001b:156; Wilcox et al. 2007:202). Thus began a hopeful search, upon which the scale of the Confederacy’s signaling network depended (Wilcox et al. 2007:200).

By early 1999, the Hilltop Survey had yet to locate the linchpin site (Wilcox et al. 2007:200-202). David Wilcox, Judi Myers, and Rollie Myers discussed Horseshoe Butte as a distinct possibility. The latter two climbed to the top, where they encountered a “hilltop fort” which offered commanding views of numerous Pueblo III (ca. A.D. 1150-1300) and Pueblo IV (ca. A.D. 1300-1450) period sites. They took notes, made a sketch map, saw a few pieces of plainware pottery, and removed an amount of undescribed “trash” (Museum of Northern Arizona 1999; Wilcox et al. 2001b:156; Wilcox et al. 2007:202).

In May of that year, Wilcox personally visited the site on Horseshoe Butte, accompanied by Gerald Robertson, Jr. They noted the site’s level of concealment from below, and Wilcox described a rubble-core perimeter wall of boulders. Two “house foundations” were recorded inside this wall and three others outside (Museum of Northern Arizona 1999; see also Wilcox et al. 2007:Table 7.1). They found just five sherds, all plainware. Historic trash was noted, but not described. Based on this visit, Wilcox and Robinson interpreted the site as not just a prehispanic lookout, but the missing link in their signaling network (Wilcox et al. 2001b:156-157), a conclusion seemingly at odds with their later critique of Austin (2000) for having been “led to consider some sites with only a few sherds and lithics” as signaling lookouts (Wilcox et al. 2007:199). This appears not to have been principle, however, as the Elephant Butte site (AZ U:1:20 [ASU]) was listed in the same publication as part of the signaling network (Wilcox et al. 2007:209, 213), despite having no ceramics (Wilcox et al. 2007:Table 7.3). Nevertheless, a Museum of Northern Arizona site file was created for Horseshoe Butte (NA25,985). Unfortunately, the site was neither reported to the landowner (BLM) nor recorded with the state. The importance of the site’s discovery is evident in subsequent publications:

“[W]e have discovered six new sites that are nodes in a continuous series of line-of-sight relationships. From north to south these sites are Boulder Maze, Lower Stoddard, ... Townsend Butte, Horseshoe Butte, and Rosalie Lookout. From south to north, the connections established now are Indian Mesa and Boulder Creek (north of Lake Pleasant) to Henrie (at the south end of Black Mesa) to South Fort and then East Fort (in Horseshoe Basin), then to Horseshoe Butte (northwest of Perry Mesa) and on to Copper Mountain (near Mayer) and Boulder Maze (east of Humbolt). From a ridge 50 to 75 m

northeast of Boulder Maze one could signal to Norwall and thence to Emilienne (Coyote) and to Janet and on to Little Granite Mountain (Albee). The establishment of these observations strengthens the hypothesis that local systems throughout this area were closely integrated” (Wilcox et al. 2001a:121).

and

“Essential to this strategy ...[of mutual defense] was early warning, so the Perry Mesa forces could be rapidly concentrated wherever needed ... Thus there is a chain of line-of-sight relationships from Point Extreme ... to site AR 03-12-01-1364 ... to Squaw Creek Ruin... to Horseshoe Butte ... and from Rosalie Lookout ... and Six Bar Lookout ... to Squaw Creek Ruin ... and from Six Bar Lookout to Fort Metate...” (Wilcox and Holmlund 2007:19).

An argument that these and other sites comprised a viable, integrated communications network depends, at the very least, on contemporaneity, making the dating of the Horseshoe Butte site an important matter. The Hilltop Survey team suggests that the site could have been established as early as 1100 CE (Wilcox et al. 2007:Figure 7.2; Wilcox et al. 2008:Figure 16.2; see also Wilcox et al. 2001a:Figures 6.1 and 6.5) and used as late as 1400 (Wilcox et al. 2001b:Appendix 7.1) or 1450 CE (Wilcox et al. 2001b:Figure 7.12; Wilcox et al. 2007:Fig-

ure 7.1), a range that certainly overlaps with better-dated sites in the proposed network.

Barely described and seldom discussed, the Horseshoe Butte site quietly became a fixed and central feature within the Confederacy’s proposed signaling network (Wilcox and Holmlund 2007:19; Wilcox et al. 2001a, 2001b; Wilcox et al. 2007; see also Hughart 2002), labeled in one map as a “main relay lookout” (Wilcox et al. 2008:Figure 16.2). Without Horseshoe Butte, the network would be unable to operate at the scale envisioned (see Wilcox et al. 2007; Wilcox et al. 2008:Figure 16.3; see also Watkins 2016:Figure 4.2).

THE NINETEENTH CENTURY REFUGE INTERPRETATION

In 2010, archaeologists with Arizona State University (ASU) and the BLM undertook surveys within the Agua Fria National Monument (Simon et al. 2017). Findings included a small hilltop site northwest of Perry Mesa and across the Agua Fria River (see Figures 1 and 2). The site offers expansive views in almost every direction and is situated about 500 m from a spring. Because the site was unknown to the BLM and the state of Arizona, we did not realize until later that it was known or of interest to the Hilltop Survey project. Over the course of two weeks, the site was systematically documented and recorded. Efforts included the mapping of features and a limited, in-field analysis of surface artifacts (Rus-

sell et al. 2012; Simon et al. 2017). Our observations suggest that while the hilltop was likely visited during prehispanic times, there is nothing to suggest a sustained or intensive prehispanic occupation. Rather, extant evidence suggests construction and intermittent use by mobile Indigenous groups during the late nineteenth century. Several lines of evidence are discussed below.

SITE LOCATION

Without doubt, many of the prehispanic sites in north-central Arizona were built atop steep hills, in highly defensible positions (e.g., Austin ca. 1980, 2000; Crary 1991, Crary et al. 1992; Hoffman 1996; Holliday 1974; Spoerl 1979; van Waarden 1984; Wilcox and Holmlund 2007; Wilcox et al. 2001a, 2001b; Wilcox et al. 2007; Wilcox et al. 2008). Baby Canyon Pueblo (NA12,556) is but one example, sitting on a steep knoll, 6 km south of Horseshoe Butte. An abundance of ceramics at Baby Canyon Pueblo sug-

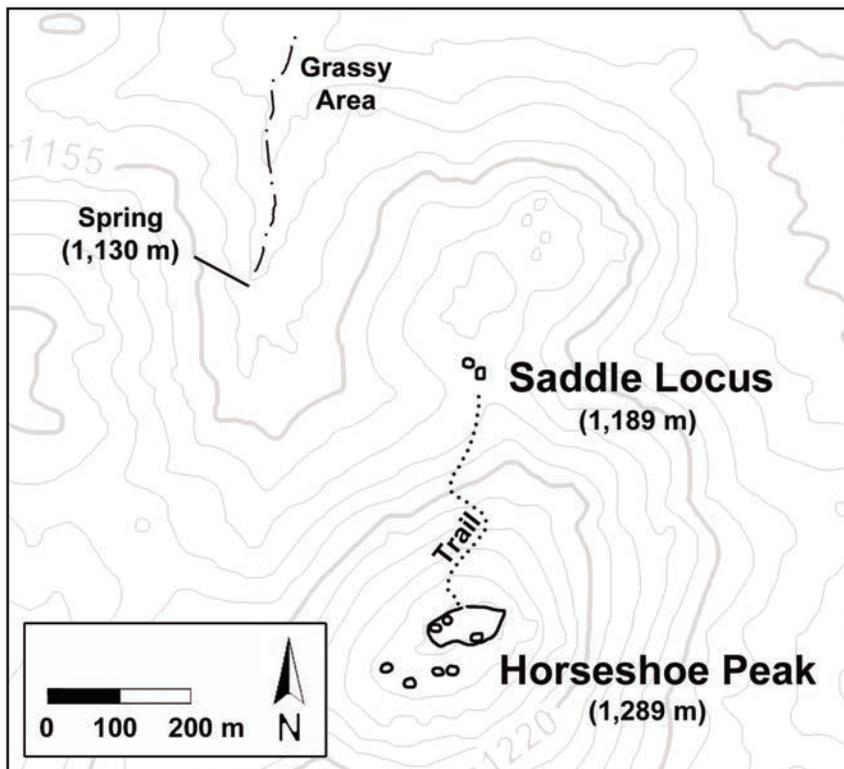


Figure 1. Map of Horseshoe Butte Site and Area to the North

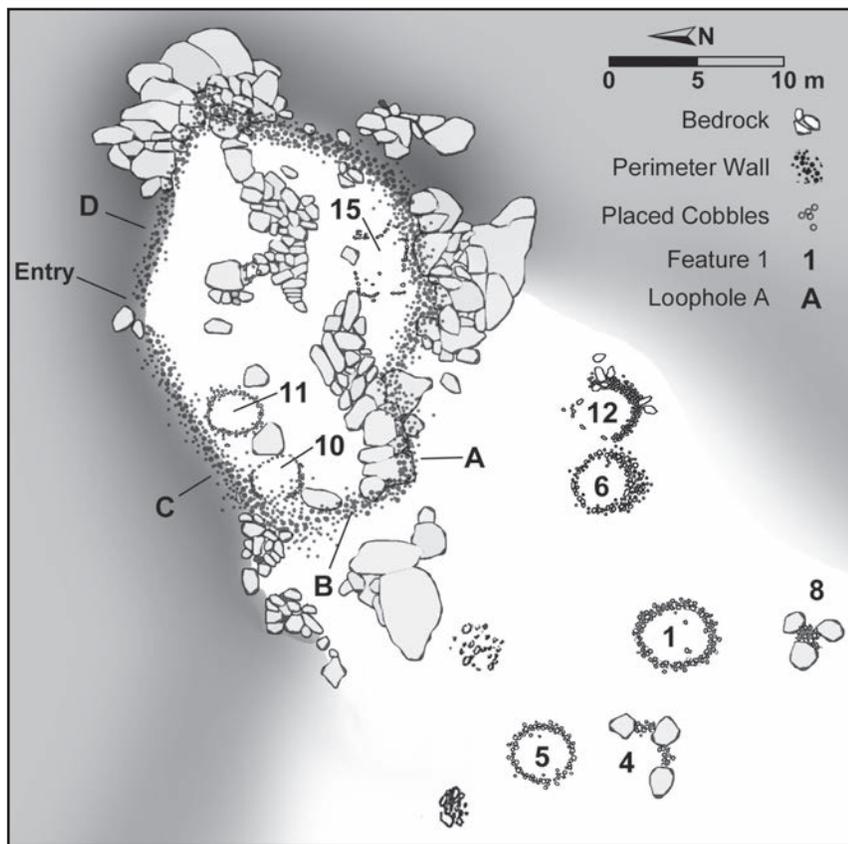


Figure 2. Plan Map of the Horseshoe Butte Site (after Russell et al. 2012:Figure 3)

gests occupation during the late Pueblo III and early Pueblo IV periods (Ahlstrom et al. 1992:109-110; Russell and Freeman 2010; Shockey and Watkins 2009; Wilcox and Holmlund 2007:Appendix B, Table 10-O). Defensive measures and hilltop placement, however, are insufficient to infer dates of use or cultural affiliation. Cortes y de Olarte (1989:65), for example, described late nineteenth century Apache sites as occupying “the steepest canyons ... surrounded by the most difficult passes ... adjacent to the greatest heights” (see also Ball 1970:22; Betzinez and Nye 1959:85; Sweeney 1991, 1992). Seymour (2009:272-273) emphasized the significance of vantage for Apache refuge sites, allowing lookouts to spot approaching enemies. She also discussed the placement of sites near pasturing locales and springs, but noted that they are seldom immediately adjacent (Seymour 2009:272-279).

Seymour (2004:160; Seymour and Robertson 2008:173) also discussed the frequency with which Apache parties situated refuge sites on or near prominent landmarks that were “easily recognized and referenced,” and where “individuals could coalesce ... after an attack”. According to one of Ball’s (1970:173) consultants, Apache parties would frequently separate, “each taking a different route to reassemble at some conspicuous landmark.” Betzinez and Nye (1959:65) wrote that

the “Apaches ... [would] always designate an assembly point ... [using] easily distinguishable landmarks”. As the highest point in the immediate area, topped with prominent bedrock outcroppings, and situated near a cloistered spring, Horseshoe Butte matches this description quite well.

PERIMETER BREASTWORK

The most elaborate feature on Horseshoe Butte is a composite breastwork that incorporates massive boulders and sections of exposed bedrock to form a low, ostensibly defensive perimeter. My observations are inconsistent with Wilcox’s description of rubble-core, masonry walls (Museum of Northern Arizona 1999). In some places, the breastwork incorporates stacked stone, but the stacking was done with far less care than is typical of prehispanic, hilltop masonry in the region (see Spoerl 1979; Whittlesey et al. 1997:680). More often than not, the breastwork on Horseshoe Butte is little more than linear piles of jumbled rock. While unlike the rubble-core walls to which it has been compared (see Figure 3), it

is similar to breastworks at Apache sites in general (see Seymour 2004:Figure 10) and local Apache or Yavapai sites in particular (J. Scott Wood, personal communication 2010).

DOMESTIC ARCHITECTURE

Three maps have been made of the Horseshoe Butte site: a sketch map by Judi and Rollie Myers, a sketch map by Wilcox, and a plan map by the ASU/BLM project. A comparison of the three maps, and their accompanying descriptions, illustrates fundamental differences in perception (see Figure 4).

The Myers map (Museum of Northern Arizona 1999) includes what appear to be two domestic structures, corresponding spatially with Features 10 and 11 (as later designated by the ASU/BLM project). Feature 10 was drawn as an open, rectilinear, three-sided structure, while Feature 11 was depicted as D-shaped and enclosed (see Figure 4, second row).

The Wilcox map (Museum of Northern Arizona 1999) shows five domestic features, the positions of which correspond with ASU/BLM Features 1, 5, 6, 10, and 11. Feature 10 is shown as roughly circular, and the other four structures appear sub-rectangular (see Figure 4, third row).

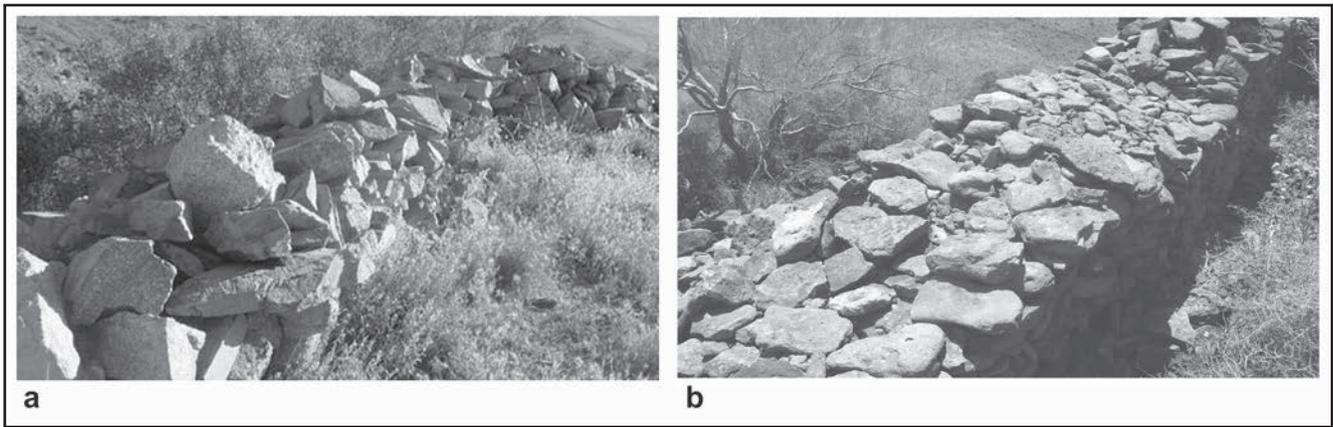


Figure 3. Comparison of the Perimeter Breastwork at the Horseshoe Butte Site (a) to the Rubble-Core Perimeter Wall at the Henrie Site (b). (Figure 3a by author. Figure 3b by and courtesy of Michael Hoogendyk).

The ASU/BLM project recorded seven domestic features (numbered 1, 5, 6, 10, 11, 12, and 15; see Figure 4, first row). Of these, Features 10, 11, and 15 are inside the perimeter breastwork. Feature 15, which is the most ephemeral of the seven, has a rectangular shape, while the other six are roughly circular.

As described by Wilcox and others, prehispanic “habitation sites in the middle Agua Fria system are pueblo room blocks” (2007:217; emphasis added). That is, during the Pueblo III and Pueblo IV periods, domestic rooms in north-central Arizona were generally (albeit not exclusively) rectangular, with masonry walls (see Fewkes 1912; Kruse-Peebles et al. 2009; Mindeleff 1896; North 2002a, 2002b; Spoerl 1979; Strawhacker,

this issue; Whittlesey et al. 1997; Wilcox and Holmlund 2007). An important question, then, discussed below, is whether the Horseshoe Butte features constitute a *habitation site*.

In contrast to typical Pueblo III-Pueblo IV period architecture, I would not describe any of the domestic features on Horseshoe Butte as “rooms,” and find no reason to believe that they ever had masonry walls. Essentially, each of the seven features amounts to a rock outline, none of which are uniform enough to suggest even foundations. Features 6 and 12 do have higher concentrations of cobbles along their southern (downslope) edges, but these are interpreted as evidence of leveling efforts rather than masonry.

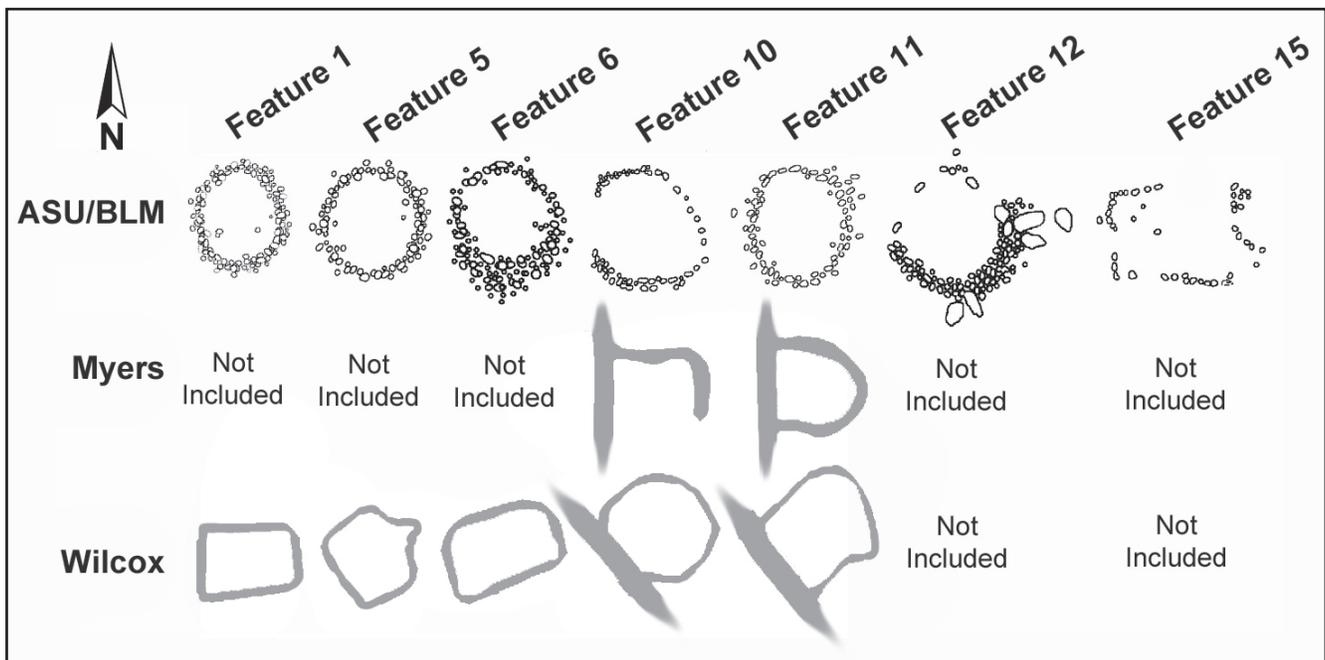


Figure 4. Comparison of Domestic Feature Depictions at the Horseshoe Butte Site (after Russell et al. 2012:Figure 4)

I suggest that the seven domestic features on Horseshoe Butte are most consistent with ephemeral brush shelters (see Arkush 1987; Seymour 2003, 2004, 2008, 2010; Seymour and Robertson 2008:166-167; Simms 1989), sometimes called *tipi rings*, *wickiup rings*, and *gowah rings*. Brush shelters are generally round or oval structures, frequently associated with Apache and Pai peoples (e.g., Bourke 1891:476; Donaldson and Welch 1991; Goodwin 1942:37; Pilles 1981; Rogers 1966; Seymour 2002, 2008, 2009, 2010). They were built of interwoven brush, cleared of interior rocks, and often covered with blankets or tarps (see Figure 5). As rocks were moved aside to create a smooth floor, an informal, circular ring was created. Collectively or in unison, these cobbles served to stabilize the structure, hold down blanket edges, and deter pests (see Seymour 2004:163-164, 2008:161, 2009:160-161, 2010:139; cf. Wedel 1961). A comparison of the Horseshoe Butte features to historic photos of intact brush shelters (e.g., Seymour 2009:Figures 1, 3) as well as modern remains of historic brush shelters (e.g., Seymour 2004:Figure 5-9, 2008:Figure 2, 2009:Figure 2, 2010:Figures 4, 6; Seymour and Robertson 2008:Figure 9; Vivian 1970:Figure 1) demonstrates striking parallels.

ADDITIONAL RAMPARTS

The topography of Horseshoe Butte is such that from its summit, one has a commanding view in almost every direction. The lower portion of the southern slope, however, is not visible from the top because of the hill's profile. Two features were installed at the apex of the hillside's convex bulge. From these, one could see anyone approaching from the hill's southern base and easily relay this information to the summit. Both are small, cleared areas with low, semi-circular breastworks of stacked stone. These are not unlike the "lookout stations" that Seymour (2002, 2004:169) has recorded at Apache sites, from which a sentinel could monitor routes that could not be seen from the main encampment.

Two additional features were recorded near the summit. Feature 8 is a modified cluster of three large boulders, just south of Feature 1. The triangular cavity between these boulders was filled with cobbles, creating a substantial rampart. Feature 4 is another modified cluster of three boulders. These three form a right angle, and cobble ramparts were built between the boulders, creating an L-shaped barrier. If the summit was attacked, people in or around Features 1 and 5 (believed to have been brush shelters) would have had ready access to cover and concealment in the form of Features 8 and 4. Seymour has recorded similar elements at the Apache site of Cerro Rojo (Site FB 9609):

"Several structural rings and crescent-shaped low rock alignments are situated outside the long wall and down slope ... These probably functioned

as ramparts, providing protection in case of attack. A single short wall, probably a rampart, is situated ... to the north ...[and] several cairns and naturally placed boulders provide numerous defensive locations across the site. The northernmost and highest peak ... also has two rock-walled structures and a cairn. These features likely had a defensive and lookout function owing to their positioning..." (Seymour 2004:166; see also Seymour and Robertson 2008:167, 173).

ARTIFACTS

While no excavation has taken place on Horseshoe Butte, some information can be derived from the site's surface artifacts. The ASU/BLM project located 87 pottery sherds, both within and without the encircling breastwork. Only two of the sherds were decorated, and these were tentatively identified as Little Colorado River White Ware, possibly from the same vessel (Brian Culpepper and Matthew Peeples, personal communication, 2010). The remaining 85 sherds consisted mostly of plain brownware with sand temper, some phyllite-tempered Wingfield Plain, and a few sherds of the red-slipped brownware common to Perry Mesa (Simon et al. 2017).

Given the frequently-cited importance of early warning to the Verde Confederacy's network in general (Wilcox and Holmlund 2007:19; Wilcox et al. 2001b:149, 155; Wilcox et al. 2007:200), and Horseshoe Butte's critical role in particular (Wilcox et al. 2001b:156-157, 161; Wilcox et al. 2008:Figure 16.2), it stands to reason that this lookout, as much or more so than others, would be frequently, if not continuously, staffed. Indeed, the Confederacy model seems to imply as much.

Following Spoerl (1979), Wilcox and colleagues (2007:199) classify hilltop sites as either *lookouts* (protective walls, no rooms), *retreats* (walled enclosures, one or two rooms), *habitation sites* (perhaps a walled enclosure, more than two rooms), or *centers* (habitation sites with 70-80 rooms). As described by the Hilltop Survey project, the Horseshoe Butte site would be classified as a *habitation site* (Museum of Northern Arizona 1999; Wilcox et al. 2001b:Appendix 7.1; Wilcox et al. 2007:Table 7.1). A scenario that involves living on Horseshoe Butte and continuously monitoring the horizons for distress signals, however, is inconsistent with the ceramic evidence. While the presence of 87 sherds does suggest prehispanic visitation or short-term, logistical use, the site's sherd density (0.002 per m²) is far below what would be expected for an inhabited or intensively-used Pueblo III-Pueblo IV period site. One could argue that recent visitors have depleted the ceramic assemblage through casual collecting, but given the site's general anonymity, remote location, and difficult approach, I would be unconvinced. There are scores of nearby prehispanic sites that are better known, highly accessible, and frequently visited, yet have far more pottery despite



Apache Indian Wick-i-up, Arizona, 1880.

Figure 5. An Apache Brush Shelter or Gowah, 1880. (Photograph by Noah H. Rose. Image courtesy of the Denver Public Library, call no. X-32810).

decades of casual pilfering, organized looting, and professional collections (see Shockey and Watkins 2009; Wilcox and Holmlund 2007:Appendices A, B, E). This is not to say that prehispanic people never sent or received signals from the summit of Horseshoe Butte. Members of something akin to the Verde Confederacy, in fact, may have made periodic use of the hilltop, as needed. However, if the Horseshoe Butte site was maintained as a prehispanic *habitation site* over the course of generations, if not centuries, it should have far more pottery than it does.

Hundreds of lithic flakes and cores were found at the Horseshoe Butte site. While these suggest an Indigenous presence (sustained, intensive, or repetitious), they are not temporally diagnostic. If they did originate during prehispanic times, the discrepancy between ceramic and lithic artifact densities is all the more striking. The complete lack of obsidian artifacts is worth mentioning. Obsidian is encountered at many Pueblo III period sites in the area, and is nearly ubiquitous at local Pueblo IV period villages (see Shackley 2005; Wilcox and Holmlund 2007: 96, Appendix D).

Late prehispanic settlements of the region were heavily dependent on plant food processing. As a result, they are consistently associated with ground stone of

various types, and often include tabular “agave knives” (see Ahlstrom et al. 1992; Ahlstrom and Roberts 1995; Fiero et al. 1980; Kruse-Peebles et al. 2009; North 2002a; see also Wilcox and Holmlund 2007:75, Appendix A, Table 6). On Horseshoe Butte, however, no such artifacts or features have been found.

Historic artifacts on Horseshoe Butte are numerous but in most cases difficult to assess. In 1999, Judi and Rollie Myers removed “some trash” from the site, but did not inventory or describe it (Museum of Northern Arizona 1999). The ASU/BLM team noted a number of historic artifacts, but most had little diagnostic value, such as bits of wire and small pieces of heavily oxidized iron. Some objects clearly date to the twentieth century, such as solder-sealed condensed milk cans. Some items are related to the geodetic survey backsight (ca. 1958), including boards, nails, and wire. Other artifacts could date to the either the nineteenth or twentieth century, such as pearlescent and amethyst glass, wrought nails, and an iron cinch or bit ring. Similar artifacts have been recorded at archaeological Apache sites (e.g., Seymour 2008:162, 2010; Seymour and Robertson 2008:169; Vivian 1970:128).

Most of the region’s late prehispanic settlements are directly associated with rock art (e.g., Carpenter

2010; Huang 2006, 2010; Napton and Greathouse 1990; Russell, this issue; Schoonover 2003; Simon et al. 2014; Simon and Russell 2017). An extensive search of the Horseshoe Butte site, however, has yet to locate a single petroglyph.

THE SADDLE LOCUS

The ASU/BLM project also recorded a concentration of features and artifacts on a small saddle, 300 m north of Horseshoe Butte (Russell 2010a; Simon et al. 2017). An undated trail leads from these features (which I refer to collectively as the *Saddle Locus*) to the only break in the hilltop breastwork (see Figure 6). Given their proximity and the connecting trail, the fortified hilltop and the Saddle Locus may be culturally associated, making a brief description of the latter worthwhile. Two cobble outlines or foundations were recorded on the saddle, one being rectangular and the other oval. These are more substantial than the domestic features atop Horseshoe Butte, yet not easily interpretable without excavation. Both structures may have had walls, although the number of cobbles present suggests that none incorporated more than two or three courses. Given the uneven terrain, some of the cobbles may have served to stabilize leveling fill. Four rock alignments – two semicircular and two straight – were recorded as well. One of the arced features, made of small boulders and having an approximate radius of 1 m, was consistent with a low rampart, overlooking the spring to the west.

A number of historic artifacts were recorded here, including a second cinch or bit ring, a coffee pot (almost identical to the one in Figure 5), enameled pot lid, silver spoon, and a rifle shell casing. The spoon was identified as part of the “Tipped” silverware set, manufactured between 1871 and 1895 by the R. Wallace and Sons Manufacturing Company (Russell 2010b; Wallace 1871). The shell casing was from a .30-40 Krag cartridge, manufactured by the Peters Cartridge Company (1887-1934; National Park Service 1985). The caliber itself was not developed until the early 1890s. The casing head stamp reads “.30 USG”, identifying it as a military-issued round, most likely fired from an M1892-99 Springfield rifle. These were standard Army issue between 1892 and 1903. The caliber eventually entered the civilian market, but civilian ammunition was head-stamped “.30-40” (see Barnes 2014; Shockley 1960). A handful of prehispanic, plainware sherds (brown paste, sand temper) and a crude basalt biface (see Figure 7) were found on the saddle as well.

INTER-SITE COMPARISON

If a number of contemporaneous and politically-affiliated sites contributed to an integrated, functional network, one would expect some degree of inter-site similarity. With this in mind, I compare the Horseshoe

Butte site with three nearby sites in the proposed communications chain: Henrie, Boulder Creek, and AZ T:4:6 (PC). These were selected because of their inclusion in the Verde Confederacy model (see Wilcox et al. 2001a:121) and because archaeological data are published or otherwise available. All are unexcavated, fortified settlements on hilltops, ridges, or interfluves to the south of Perry Mesa, originally recorded by the Central Arizona Ecotone Project (Spoerl 1979; Spoerl and Gummerman 1984).

The Henrie site (AZ N:16:1 [PC]), north of Black Canyon City, includes 13 contiguous rooms and two plazas, enclosed within a massive perimeter wall (see Figures 3b and 8a; Spoerl 1979:80-83; Spoerl and Gummerman 1984:40). The perimeter wall, which is about 1.5 m wide, is tallest and most elaborate along its eastern edge, where it rises to nearly 4 m in height in some places and includes an interior shelf or walkway. Thus, the Henrie site both typifies regional architecture (as per Wilcox et al. 2007:217) and conforms specifically to the Hilltop Survey’s *habitation site* definition (Wilcox et al. 2007:199).

Spoerl (1979:83) gave a limited description of surface artifacts, which included a *metate* fragment, stone choppers, cores, flakes, and Wingfield Plain pottery. Ken Austin told Spoerl (1979:83) that he had seen red-on-buff sherds there as well. Twenty-nine petroglyphs were recorded at the site (AZSITE file no. 97373). Spoerl (1979:82) noted that Henrie “lies about one kilometer from Interstate 17, and this accessibility has led to considerable vandalism.” Nevertheless, a not-insignificant amount of pottery remains on the surface, and the interior room walls stand over 1.2 m high (Michael Hoogendyk, personal communication, 2017). Wilcox and others (2001a:Appendix 6.1) date the site to the Pueblo III period.

The Boulder Creek site (AZ T:4:2 [PC]) sits atop a high, narrow butte to the north of Lake Pleasant (Spoerl 1979:66-69). As described by Spoerl (1979:67), the site includes seven rooms and two plaza-like areas, largely within a rubble-core perimeter wall (see Figure 8c) which, according to Joseph Crary, incorporates several small loopholes (personal communication, 2017). Spoerl’s (1979:Figure 10) plan map of the Boulder Creek site shows five fully-enclosed, contiguous features, one partially enclosed feature, and three detached features. Of the latter, one is enclosed and D-shaped. Another is enclosed and oval. The third is an L-shaped corner. Few architectural data are available beyond the perimeter wall’s dimensions, but all walls – perimeter and otherwise – are depicted identically in Spoerl’s map, suggesting that the site’s domestic rooms had masonry walls. Crary remembers that several of the rooms had substantial wall fall. He also observed a small, circular structure that resembled a granary (personal communication, 2017). This site, then, includes typical regional architecture (as per Wilcox et al. 2007:217) and is con-

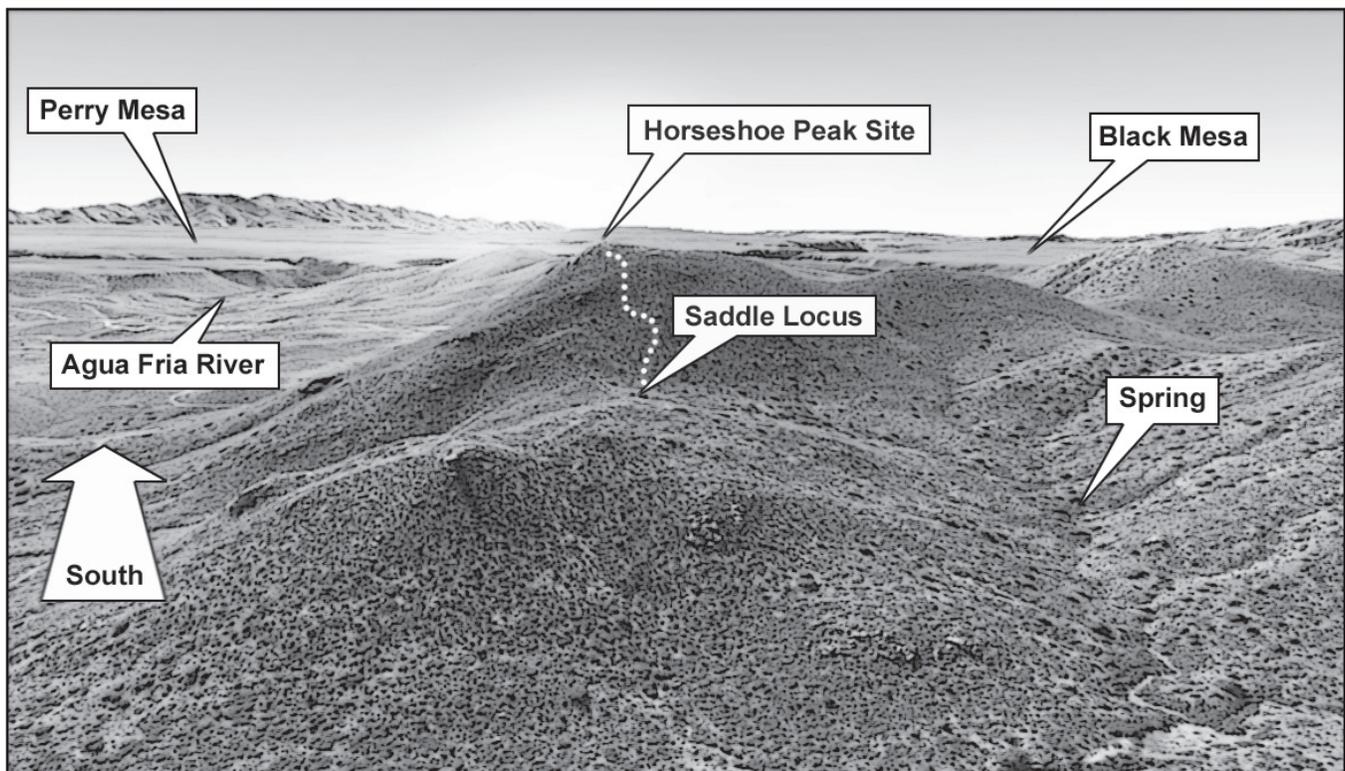


Figure 6. The Horseshoe Butte Area (Illustration by author, after 1997 Google Earth image)

sistent with the Hilltop Survey's *habitation site* definition (Wilcox et al. 2007:199).

Surface artifacts at the Boulder Creek site included two metate fragments, two "flat grinding slabs," numerous basalt scrapers and cores, one tabular knife, miscellaneous lithics, and plainware pottery (i.e., Wingfield Plain, Gila Plain) (Spoerl 1979:69). Crary noted a low artifact density in the 1990s ("hundreds" of schist-tempered plainware sherds), mostly representing plainware jars (personal communication, 2017). Spoerl (1979) made no mention of rock art at Boulder Creek, and Crary, although not looking for petroglyphs, does not recall seeing any either (personal communication, 2017).

The site of AZ T:4:6 (PC), located near the town of New River (see Spoerl 1979:73-78), includes two loci – arguably two sites – separated by about 240 m. The present comparison is limited to Spoerl's fortified Component 1, Level 3, which includes at least 12 contiguous, sub-rectangular rooms incorporated into a rubble-core perimeter wall (see Figure 8b). There is also a detached duplex and three detached rooms. Spoerl (1979:73, 76) discussed the "large amount of rubble from wall fall" inside the pueblo, which suggests substantial masonry walls. The site's features, therefore, are both typical of regional architecture (as per Wilcox et al. 2007:217) and consistent with the Hilltop Survey's *habitation site* definition (Wilcox et al. 2007:199).

Spoerl's (1979:73-78) site description mentions over 100 petroglyphs and an abundance of ceramics, including a "heavy concentration" on the slope below

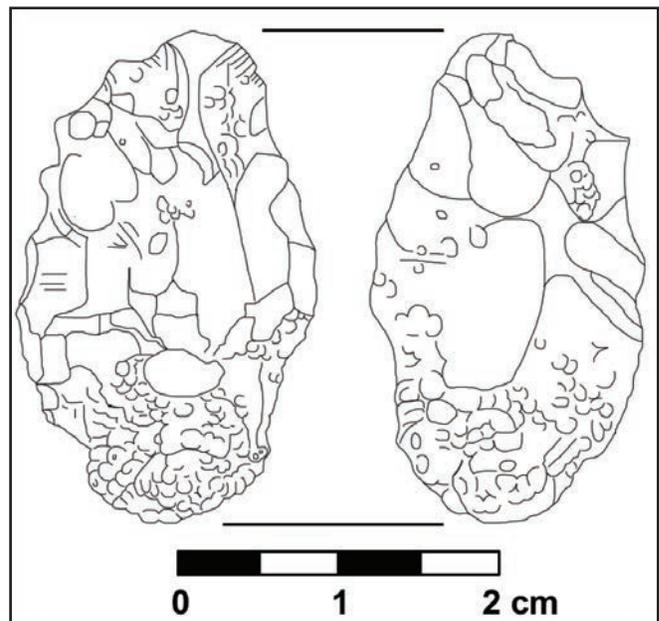


Figure 7. Biface Found at Saddle Locus (© Will G. Russell)

the pueblo. All of the recorded pottery was identified as Wingfield Plain. Non-ceramic artifacts included hammer stones, scrapers, tabular knives, cores, *manos*, *metates*, *Glycymeris* shell bracelet fragments, a slate spindle whorl, and obsidian (Spoerl 1979:77). Wilcox and colleagues (2001a:Appendix 6.1) identify this as a Pueblo III site.

A comparison of the Horseshoe Butte, Henrie, Boulder Creek, and AZ T:4:6 (PC) sites illustrates both similarities and differences (see Table 1). All four sites are defensively positioned atop steep hills, ridges, or interfluves. All combine substantial perimeter barriers, although those on Horseshoe Butte are hasty breastworks, and those at the other sites are rubble-core walls. The barriers at the Horseshoe Butte, Henrie, and Boulder Creek sites include loopholes, but there is no record of any at AZ T:4:6 (PC). Pottery and chipped stone artifacts have been recorded at all four sites, but the ceramic density at Horseshoe Butte is considerably lower than those at the other three sites. Of the four, only Horseshoe Butte lacks groundstone and includes historic artifacts. Like most late prehispanic residential sites in

the region, the Henrie and T:4:6 sites include rock art, while the Horseshoe Butte site does not, and the Boulder Creek site may not.

While there is inter-site variability in architectural layout – due largely to topographical constraints – two general patterns emerge with regard to architectural construction, at least within this small sample. At the Henrie, Boulder Creek, and AZ T:4:6 (PC) sites, domestic architecture consists of contiguous, rectangular, masonry structures, probably with full-height walls (see Figure 9b). These, then, are both typical of regional, late prehispanic architecture as described by Wilcox and others (2007:217) and conform specifically to their hilltop *habitation site* definition (2007:199). The Horseshoe Butte site, on the other hand, has no roomblocks, rooms, or

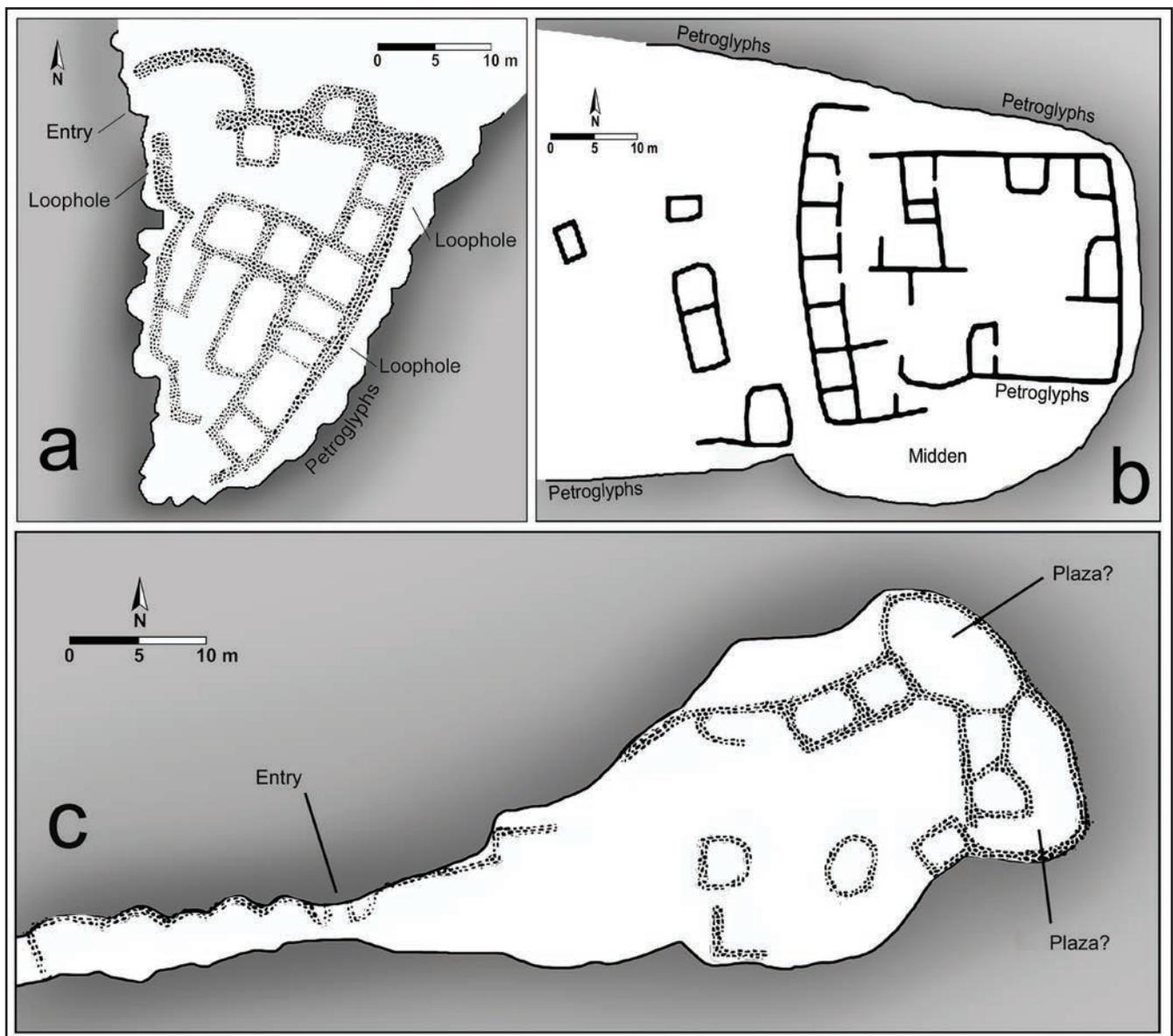


Figure 8. Comparison of Architectural Layout at the Henrie (a), AZ T:4:6 (PC) (b), and Boulder Creek (c) sites (Figure 8a after Spoerl 1979:Figure 15; Figure 8b after Spoerl 1979:Figures 12 and 13; Figure 8c after Spoerl 1979:Figure 10).

Table 1. Comparison of Attributes at Four Verde Confederacy Signaling Stations

	Precipice ^a	Rock Art	Architecture					Artifacts			
			Defensive		Domestic			Groundstone	Pottery	Lithics	Historic
	Perimeter ^b	Rubble-Core ^c	Loopholes ^d	Integration ^e	Contiguity ^f	Masonry ^g					
Henrie	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Boulder Creek	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
AZ T:4:6 (PC)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Horseshoe Butte	✓		✓		✓				✓	✓	✓

^a Site location on hilltop, ridge, or interflue
^b Site includes perimeter wall or breastwork
^c Perimeter wall or breastwork is doubled, with cobble-filled cavity in the center
^d Perimeter wall or breastwork includes holes for shooting and/or viewing
^e Domestic architecture is integrated with perimeter wall or breastwork
^f At least two domestic features share at least one wall
^g Domestic features constructed of cobble masonry, having stood at least 1 m high

even masonry walls. Rather, the only evidence of domestic architecture on Horseshoe Butte consists of circular rock alignments, consistent with brush shelters (see Figure 9a).

CONCLUSION

In the late 1800s, north-central Arizona was both homeland and refuge to Yavapai and Apache bands engaged in resisting and/or avoiding U.S. military aggression (e.g., Bourke 1891, 2007; Goodwin and Basso 1971; Thrapp 1967; Utley 1973:197). The constant threat of discovery, attack, and capture understandably contributed to decisions concerning travel routes and camp placement (e.g., Seymour 2009:272). Apache and Yavapai encampments were used temporarily and inter-

mittently, often leaving subtle traces on the landscape that can be difficult to recognize archaeologically. Ephemerality, however, is not a defining characteristic of Apache and Yavapai sites. There are a number of fortified sites along the middle Agua Fria and Verde rivers that may well be Apache or Yavapai in origin, but which have been interpreted as prehispanic based largely on architectural investment (i.e., “masonry” perimeter “walls”). I would suggest that the site on Horseshoe Butte serves as an excellent example.

At any point in time, Horseshoe Butte would have served well as a defensive locale with remarkable communications potential. The site’s location, height, and defensive posture not only complement the Verde Confederacy model, but are critical to its operation and scale as envisioned. The purpose of this paper is not to argue against the Verde Confederacy model, or even to suggest that the site on Horseshoe Butte did not play an important role in such an institution. I have backed away from my earlier and unnecessarily dichotomous position (Russell et al. 2012), acknowledging that evidence from Horseshoe Butte suggests a long history of landscape use during the Archaic, prehispanic, historic, and modern eras.

Nevertheless, I would argue that the evidence from Horseshoe Butte is inconsistent with continuous or sustained, prehispanic occupation. Relatively few sherds were encountered at the site, and no groundstone, obsidian, tabular knives, or rock art have been found. While it is clear that the hilltop was visited during prehispanic times – a late Archaic dart point and 87 sherds were encountered – the paucity of early artifacts is more consistent with short-term, low-intensity, osten-

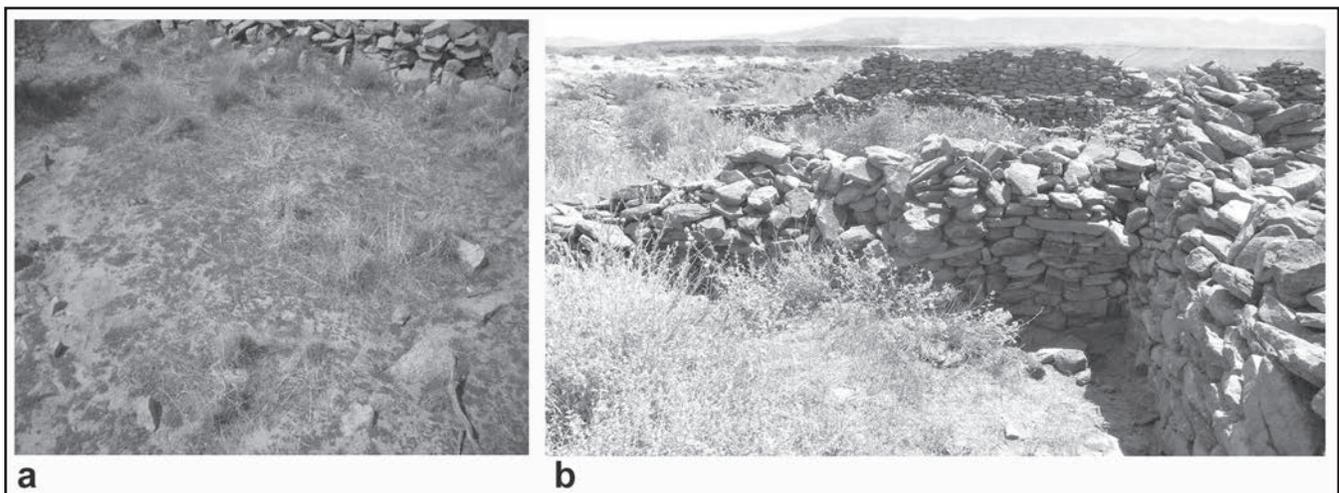


Figure 9. Comparison of Domestic Architecture at the Horseshoe Butte (a) and Henrie (b) Sites. (Figure 9a [Feature 11] by author; Figure 9b by and courtesy of Michael Hoogendyk)

sibly logistical use. Without a persistent presence and dedicated attention, the Horseshoe Butte site could not function as a reliable go-between for sub-systems to the north and south, or within the Perry Mesa Settlement System itself (*sensu* Wilcox and Holmlund 2007). Time-sensitive warnings of imminent attack, or desperate pleas for reinforcements would go unreceived. Again, this is not to say that Horseshoe Butte was never used for signaling in support of a political alliance. If it was, however, such use was likely intermittent and proactive, which should stimulate continued dialogue concerning the Verde Confederacy's nature, scale, infrastructure, and limitations.

Rather than representing a prehispanic *habitation site*, I would argue that the primary archaeological component on Horseshoe Butte dates to the late nineteenth century. The site's perimeter is bounded by a hasty breastwork rather than a masonry wall. What is left of the domestic architecture is suggestive of brush shelter bases rather than Puebloan rooms. Whereas there are relatively few prehispanic artifacts, historic artifacts have been encountered across the site and at the nearby Saddle Locus.

It is my hope that research continues in the Horseshoe Hills, the majority of which has yet to be surveyed. The Horseshoe Butte site, in particular, clearly deserves more attention. Although a handful of archaeologists have made the climb and looked at the same things, we have *seen* them in strikingly different ways. This may relate to the ways in which the site was approached. The earlier project adopted a deductive approach, looked for a site that fit their model, and found it (Wilcox et al. 2007:200). The later project stumbled across the same site, took an inductive approach, and came to an entirely different conclusion (cf. Brandes 1957 vs. Vivian 1970). Perhaps it is time to introduce new methods, combining both inductive and deductive approaches (see Gregory 1981), involving descendant communities, and considering both normative and anomalous explanations.

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AN HISATSINOM PRESENCE ATOP PERRY MESA

Will G. Russell

ABSTRACT

In and around the fourteenth century, a diverse collection of peoples arrived on Perry Mesa from various parts of the Southwest. Today, people from several Indigenous groups trace their ancestry, in part, to this distinctive landscape. Drawing upon traditional histories, the ethnographic literature, and archaeological data, I present evidence to suggest that some of Perry Mesa's prehispanic rock art references an ancestral Hopi (Hisatsinom) presence. A compelling number of sampled petroglyph motifs are stylistically consistent with ethnographically-documented, self-referential symbols used by certain Hopi clans, many of which discuss ancestral migration through this part of the Southwest. I also discuss a recurring motif on Perry Mesa that may reference a now-extinct Hisatsinom clan.

A number of Native Southwestern groups recognize ancestral connections to Perry Mesa and the surrounding landscape. These include the Akimel O'odham, Piipaash, Yavapai, Western Apache, and some Hopi clans. This paper represents a preliminary effort to examine evidence of cultural continuity between prehispanic peoples of Perry Mesa and portions of today's Hopi community. The analysis is made possible by certain Hopi practices, which are recorded in clan histories and supported by archaeological evidence. Specifically, ancestral Hopi peoples (*Hisatsinom*) are described as following a religious mandate that involved the placement of clan symbol petroglyphs at settlements along their respective migration routes (see Kuwanwisiwma and Ferguson 2004). Thus, archaeologists should be able to recognize *Hisatsinom* sites through the presence of such symbols. A number of studies, in fact, have borne out this expectation (e.g., Bernardini 2002, 2005, 2007; Colwell-Chanthaphonh and Ferguson 2006; Courlander 1971:36; Dongoske et al. 1993; Ferguson 2003; Ferguson and Lomaomvaya 1999; Kuwanwisiwma and Ferguson

2004; Lyons 2003; Mindeleff 1891:31; Russell and Wright 2009). A similar approach is taken here, comparing petroglyph motifs on Perry Mesa to Hopi clan symbols documented in the ethnographic literature.

The remainder of the paper is divided into three parts. The first draws from Hopi ethnographic material, focusing on clans, their ancestral migrations, and the self-referential symbols they use. In the second, I discuss my analytical framework, expectations, and samples. The third section comprises analytical results, derived inferences, and avenues for future research.

PART I: HOPI CLANS, CLAN MIGRATIONS, AND CLAN SYMBOLS

Traditional Hopi histories discuss the emergence of people into this, the fourth world. Leaving the corrupted third world behind, they climbed up and through a hole in the sky (the *Sipapuni*), emerging near *Ongtupqa* (the Grand Canyon). The new arrivals were greeted by the god *Masau'u*. They were divided into clans and sent off in search of *Tuuwanasavi* (the world's center), where they would eventually reunite (e.g., Courlander 1971; Ferguson et al. 1993:27; Fewkes 1907:566; Geertz 1984; Goldfrank 1948; Kuwanwisiwma 2002; Kuwanwisiwma and Ferguson 2004; Stephen 1929, 1936; Titiev 1948; Vecsey 1983; Yava 1978). The *Hisatsinom* were instructed to leave clan symbol petroglyphs wherever they went, permanently marking their journeys upon the landscape (Bernardini 2002, 2005, 2007; Ferguson and Colwell-Chanthaphonh 2006; Kuwanwisiwma and Ferguson 2004).

An impressive number of Hopi clans have been identified ethnographically (Colton 1960; Eggan 1950; Ferguson and Colwell-Chanthaphonh 2006:Chapter 5; Fewkes 1897, 1900; Hodge 1896; Mindeleff 1891; Nequatewa

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1936; Saufkie 1998; Titiev 1944; Voth 1905) and archaeologically (Bernardini 2002, 2005, 2007; Colton and Colton 1931; Ferguson 2003; Lyons 2003; Michaelis 1981). This is not to say, however, that anthropologists have a thorough or entirely accurate understanding of Hopi clans, past or present (see Rushforth and Upham 1992; Whiteley 1985, 1986). As described ethnographically, Hopi clans are exogamous social units with inherited, matrilineal membership (e.g., Eggan 1950). Among the Hopi, they are conceptualized as direct lineages (e.g., Hodge 1896; Mindeleff 1891). However, elements of oral tradition, ethnographic insight, and archaeological evidence combine to suggest that the current nature and structure of Hopi clans cannot be extended directly backward in time (Bernardini 2005, 2008; Colwell-Chanthaphonh and Ferguson 2006). Rather, the clans known to ethnographers developed out of what Colwell-Chanthaphonh (2009:199) refers to as *proto-clans* – largely autonomous, serially-migrating (Bernardini 2005, 2008), and socially-cohesive residential groups with unique histories. Bernardini compares these *Hisatsinom* proto-clans to Lévi-Strauss' (1982) *house societies*, describing them as “local groups ... organized by shared residence [and expressing] identity primarily through performance of a proprietary ceremony” (Bernardini 2008:484).

Clan Names. Many Hopi clans are named for tutelary figures (e.g., *Masau'u* Clan), totemic animals (e.g., Badger Clan), or important plants (e.g., Tobacco Clan). Others were named for objects (e.g., Strap Clan), and some were inspired by collective experiences, such as with the Bear Clan, so-named because members encountered a dead bear during their migration (Voth 1905:276). Differences in translation and orthography have contributed to confusion over the number and nature of Hopi clans. There is widespread disagreement, for example, as to whether the “Arrow Clan” and “Reed Clan” are conglomerate, synonymous, or distinct (see Bernardini 2007; Colton and Colton 1931; Fewkes 1900; Michaelis 1981). Ethnographers have discussed the Ant Clan, Large Ant Clan, Red Ant Clan, and Large Dark Red Ant with Painful Sting Clan, which may reflect anywhere from one clan (with differentially-translated names) to four separate clans with similar names. Anthropologists have distinguished between two “Bird” clans, two “Tobacco” clans, two “War God” clans, three “Lizard” clans; and three “Katsina” clans (which does not include the Warrior Katsina, Warrior Katsina Woman, or *Eototo* Katsina clans) (Ferguson 2003; Fewkes 1900; Lyons 2003; Mindeleff 1891; Michaelis 1981). Nor are anthropologists always in agreement as to whether various entities even are clans. Fewkes (1900), for instance, listed the *Sakwalelent* (Blue-Green Flutes) and *Macilelent* (Grey Flutes) as clans, whereas Lyons (2003) suggests they are better understood as medicine societies.

Clan Migrations. Migration narratives are central to Hopi clan histories and group identity. Some Hopis, from some clans, have shared portions of migration accounts

with ethnographers, albeit in varying detail. Although these stories can assist archaeologists in tracing prehispanic *Hisatsinom* movements, clan migration narratives are a combination of allegory and historical events, thus requiring careful navigation. Recent and ongoing work by researchers such as Loma'omvaya, Kuwanwisiwma, Ferguson, Bernardini, and Colwell has contributed significantly to our understanding through ethno-archaeological information, thoughtful insight, and advances in research approaches and methodology (e.g., Bernardini 2002, 2005, 2007, 2008; Ferguson 1998, 2003; Ferguson and Colwell-Chanthaphonh 2006; Ferguson and Lomaomvaya 1999; Kuwanwisiwma and Ferguson 2004).

A few caveats are particularly germane to the present analysis. First, Hopi clan histories do not describe migrations in the classical sense of finite episodes of resolute movement across the landscape along a predetermined route to a geolocated destination. Rather, they are multi-generational accountings of where groups lived and what they did between emergence and reunion. Following Fox (1997), Bernardini (2008:484) refers to clan migration narratives as topogenies of places. While there is general agreement that arrival at *Tuuwanasavi* was a goal or eventuality, finding it was generally not a preoccupation (see Ferguson and Lomaomvaya 1999:100-101; for exception, see Ferguson 1997:24). Settlements were established and occupied for generations at a time, and people would eventually move on for one reason or another in what Bernardini (2005) calls “serial migration.” While *Hisatsinom* migration narratives can inspire archaeologically-testable hypotheses (at times with rewarding results), they cannot be treated as literal accounts of the past (Bernardini 2005:30-31, 2008; Kuwanwisiwma 2002).

Part of my analysis involves what are often described as clan “origins.” Because all clan histories originate at the *Sipapuni*, subsequent settlements (i.e., between *Ongtupqa* and *Tuuwanasavi*) are better understood as waypoints. *Hisatsinom* waypoints vary according to location, size, length of occupation, and demography. Those often referred to as “origins” are generally the oldest settlement in a clan’s collective memory. To distinguish these from later settlements, I refer to them as *homelands*. It is tempting to think of clan migrations as direct, linear movements from homeland to *Tuuwanasavi*, but this is unlikely. The Hopi symbol for clan migration, after all, is a spiral, narrowing with each pass as it approaches the center. Nor should we assume that clan migrations had specific beginnings and ends, geographically or temporally. As Anthony (1990) discussed, and Southwestern archaeologists have demonstrated (e.g., Cameron 1995; Clark et al. 2013; Duff 1998), migrations generally occur in piecemeal fashion, as processes that involve continued, bidirectional movement and interaction (see also Burmeister 2000). Many clan narratives, for example, discuss living at *Homol'ovi* before continuing on to *Tuuwanasavi* (the Hopi Mesas). We know,

however, that *Homol'ovi* continued to be occupied, with people and goods moving back and forth between the world's center and the late *Hisatsinom* waypoint (e.g., Adams et al. 1993). Bernardini (2014) has demonstrated a similar pattern of ongoing interaction between Perry Mesa and *Tuuwanasavi*.

Some of the homelands described in Hopi clan narratives are shown in Figure 1. Some are described as specific settlements, such as *Kawestima* (Keet Seel), but most are references to regions of various size, such as *Nuvatukya'ovi* (Flagstaff area), *Toko'navi* (lower San Juan), and *Muiobi* (northern Rio Grande). Another homeland, *Palatkwapi*, has proven difficult to identify geographically (Ferguson and Colwell-Chanthaphonh 2006:97), and has been associated with the Phoenix Basin (Voth 1905:36-37), "near San Carlos" (Fewkes 1900:597), southern Arizona (Hodge 1910:193), Paquimé (Lekson 2009:214), central Mexico (see Fewkes 1900:622), and Central America (Snodgrass 2000:256). While most sources are in agreement that *Palatkwapi* lies somewhere to the south of *Tuuwanasavi*, some "Hopi intellectuals caution that *Palatkwapi* may be an epoch as much as a specific place, a representational time as much as an absolute space" (Ferguson and Colwell-Chanthaphonh 2006:97).

The nature of *Hisatsinom* serial migration, combined with the ways in which it has been remembered,

interpreted, and recorded, complicates efforts to geographically map the movement of clans on the prehispanic landscape (Ferguson and Colwell-Chanthaphonh 2006:97). For example, Hopi consultants told Fewkes (1900) that the Bear Clan came from *Muiobi*. A century later, Hopi historians told Ferguson (2003) and Lyons (2003) that the Bear Clan came from *Palatkwapi*. What appears initially as an inconsistency is in fact unsurprising, given what we know about proto-clan movement, structure, and plasticity. The Bear Clan may have left *Palatkwapi* and settled in *Muiobi* for a time before continuing on, or *vice versa*. They could have split into smaller groups somewhere, going in different directions, only to reunite later. Distinct, theretofore-unrelated "bear clans" could have come separately from both places, meeting at *Tuuwanasavi* and merging in acknowledgement of their shared totem. It is even possible that one group (from one homeland) arrived at *Tuuwanasavi* to find that *the* Bear Clan (from another homeland) held considerable power (see Sekaquaptewa 1999; Talayesva 1942:14, 72, 436; Titiev 1944:61-65; Whiteley 1987:700-701), prompting them to self-identify as distant relations.

Clan Symbols. Most Hopi clans, perhaps all, had at least one traditional clan symbol. These were used in reference to the clan itself, as well as to individual members (Fewkes 1897). More often than not, clan symbols

are stylized pictograms, designed to evoke the clan's namesake. The Bear Clan uses a bear paw, for example (see Figure 2a), and the Eagle Clan employs the image of an eagle (see Figure 2b). Some symbols are further removed from their referent, requiring an emic explanation. The primary symbol used by the now-extinct Oak Clan, for instance (see Figure 2c), is an abstracted reference to the oaken frames used by Hopi women to support "butterfly" hair whorls (Colton and Colton 1931:33). Seemingly incongruous symbols may reflect histories of clan division, synthesis, subsumption, or affiliation. Examples include cross-clan, iconographic similarities, such as those involving the Reed and Arrow clans (see Figures 2d and 2e, respectively), or the Crane and Red Ant clans (see Figures 2f and 2g, respectively). Other esoteric symbols suggest some conceptual association that remains unknown to anthropologists, such as the Sand Clan's triangle and square motifs (see Figures 2h and 2i). Many of the ethnographically-recorded Hopi clans are known to have used multiple symbols, some of which are similar (e.g., Figures 2j and 2k), and others that clearly have different referents (e.g., Figures 2l and 2m).



Figure 1. U.S. Southwest, Showing *Hisatsinom* Settlements and Homeland Regions Discussed in Text.

PART II: SAMPLES, METHODOLOGY, AND EXPECTATIONS

Here, I discuss the data used in the present analysis, and the ways in which Perry Mesa's prehispanic petroglyphs are compared to ethnographically-documented Hopi clan symbols. This includes some discussion of expectations based on traditional Hopi practices and stochastic assumptions. I also discuss ways in which heretofore unknown clan symbols, used by hypothesized, now-extinct clans, can be identified with some degree of confidence.

Hopi Clan Inventory

In the indigenous Southwest, few social structures have received more ethnographic attention than the Hopi clan system (e.g., Bernardini 2008; Brainard 1939; Eggan 1950; Fewkes 1897, 1900; Forde 1931; Hodge 1896; Levy 1992; Lowie 1929; Mindeleff 1891; Nequatewa 1936; Stephen 1936; Rushforth and Upham 1992; Titiev 1944; Voth 1905; Whiteley 1985, 1986, 1987, 1988). These efforts have been augmented also by a number of Southwestern archaeologists (e.g., Bernardini 2002, 2005, 2007, 2008; Colton 1960; Colton and Colton 1931; Ferguson 2003; Ferguson and Colwell-Chanthaphonh 2006; Ferguson and Lomaomvaya 1999; Lyons 2003; Michaelis 1981; Olsen 1985). In spite of all this work – and in some ways, perhaps, because of it – clarity remains elusive.

The analysis in Part III draws upon a comprehensive inventory of 165 ethnographically-recorded Hopi clans. Efforts are taken to identify and eliminate duplicate entries resulting from differences in translation and/or specificity. Nevertheless, information on some clans in the comprehensive inventory cannot escape all doubt. For example, the comprehensive inventory includes both a Firewood Clan (*Kokop Wiñwû*), recorded by Fewkes (1900), and a Fire Clan (*Kookopngyam*), recorded by Lyons (2003). Michaelis (1981:15) treated the two English translations as synonymous references to a single clan, and the Hopi names are similar. However, while the Firewood Clan reports migrating from *Muiobi* to *Sikyatki* (Fewkes 1900) and then to *Tuuwanasavi* (Michaelis 1981), the Fire Clan describes going from *Kawestima* to *Homol'ovi*, and then to *Tuuwanasavi* (Lyons 2003). Thus, the question of whether there are (or were) distinct Fire and Firewood clans remains unanswered. There are other cases (e.g., the Blue-Green Flutes and Grey Flutes) wherein researchers disagree as to whether particular entities are clans or sodalities. For these reasons, I also

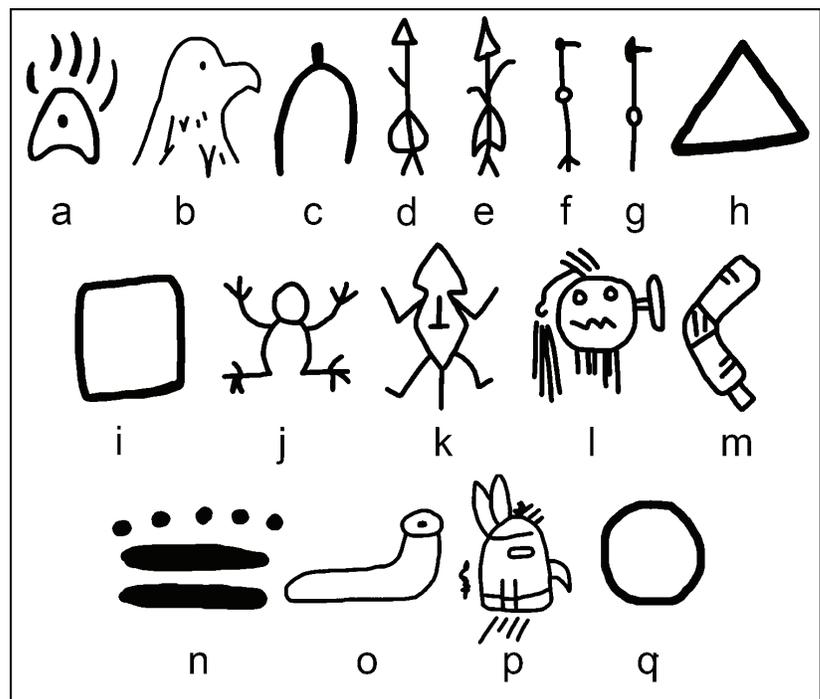


Figure 2. Hopi Clan Symbols Representing the Bear (a, n), Eagle (b), Oak (c), Reed (d), Arrow (e), Crane (f), Red Ant (g), Sand (h, i, q), Horned Toad (j, k), Tansy Mustard (l, m), Tobacco (o), Katsina (p) Clans. (After Bernardini 2002 [c, h, n, q], 2008 [e], Colton and Colton 1931 [d, g, i], Fewkes 1897 [l, m, p], Mallory 1886 [f, j, k], Nequatewa 1936 [b, o], and Olsen 1985 [a]).

consider a *conservative* subset ($n = 141$), from which 24 clans, of uncertain or unresolved status, are excluded.

Hopi Clan Symbol Inventory

Our knowledge of Hopi clan symbols comes primarily from a small collection of early anthropological works (e.g., Colton and Colton 1931; Fewkes 1897, 1900, 1903; Forde 1931; Mallory 1886; Mindeleff 1891; Nequatewa 1936; Titiev 1944). In the years since, a few ethno-archaeological studies have added to this, while simultaneously demonstrating the range of stylistic diversity that might be expected (e.g., Bernardini 2002, 2005, 2007; Michaelis 1981; Olsen 1985). Of the 165 clans in the comprehensive Hopi clan inventory, 56 have at least one ethnographically-documented clan symbol, with a total of 401 distinct motifs (see Bernardini 2007; Russell and Wright 2009:Figure 1). These are compared to the Perry Mesa sample in Part III.

In addition to ethnographic data, information has come from the site of *Tutuveni*, situated between *Tuuwanasavi* and *Ongtupqa*. No other site has done more to advance our understanding of Hopi clan symbols, especially in the context of illustrating the seamless transition from *Hisatsinom* to *Hopi*, demonstrating the benefits of combining ethnographic insight with archaeological data, and underscoring the importance of ongoing collaboration with descendant communities. For centuries, *Hisatsinom* and Hopi men have stopped

at *Tutuveni* during ritual pilgrimages to visit the *Sipapuni* and gather salt (Colton and Colton 1931; Talayesva 1942). While there, men traditionally carved their clan symbols into the sandstone before moving on (see Figure 3), resulting in an ancient and ongoing materialization of clan iconography, demography, and ritual practice (Bernardini 2007). Colton and Colton (1931; see also Colton 1960), and Michaelis (1981) documented some of *Tutuveni's* clan symbol rock art, in collaboration with Hopi consultants. Bernardini (2007) recently completed a comprehensive and detailed inventory of the site's petroglyphs, situating the clan symbols within social and historical contexts.

One of Bernardini's (2002, 2005, 2007) methodological contributions involves the identification of symbols that likely reference extinct *Hisatsinom* clans. This adds a novel dimension to clan symbol research that is less dependent upon – in some ways freed from – the limitations of ethnographic data. That is, archaeologists are no longer restricted to the comparison of prehispanic motifs on one hand to ethnographically-established exemplars on the other. There is now the potential to recognize as-yet-undocumented clan symbols, adding to what had become a static inventory. This approach came from Bernardini's (2002, 2005) study of *Hisatsinom* migration and the development of a collective *Hopi* identity. One of his several lines of evidence involved the distribution of Hopi clan symbol-like motifs in prehispanic rock art at sites in northern Arizona. In locating and recording these, Bernardini came to rec-

ognize characteristic patterns involving the selection, execution, placement, and frequency of motifs. These patterns could be used to identify likely clan symbols, even if these symbols (and their referenced clans) were unknown to both anthropologists and cultural descendants. Specifically, Bernardini encountered three simple, yet idiosyncratic motifs that were repeated within and between several sites. Based on their appearance, recorders took to calling these motifs "rabbit ears," "box-tails," and "coatis". Regardless of location, these were replicated similarly, predictably positioned, redundant, and near symbols used by known clans. The three motifs were shown to Hopi advisers, who agreed with Bernardini that the petroglyphs likely referenced extinct *Hisatsinom* clans. Bernardini (2007) later used this approach to identify a number of extinct clan symbols at *Tutuveni*.

Motif Recognition

To assess the likelihood that petroglyphs on Perry Mesa are attributable to *Hisatsinom* clans, I consider a series of attributes that were offered, implied, or inspired by Bernardini (2002, 2005, 2007). Each contributes to an overall determination, but none are definitive.

1. *Resemblance*. Generally speaking, candidate motifs should resemble one of the 401 documented Hopi clan symbols, as recorded ethnographically (e.g., Fewkes 1900) or identified archaeologically (e.g., Bernardini 2002, 2005, 2007). The only excep-



Figure 3. An Example of Hopi Clan Symbol Accumulation at *Tutuveni*.

tion would be motifs consistent with heretofore-unrecognized, extinct clan symbols.

2. *Abstraction*. In Bernardini's (2005:100) words, Hopi clan symbols generally "feature a spare, conventionalized style without a great deal of detail or elaboration."

3. *Element Isolation*. Hopi clan symbols are not incorporated into larger narrative scenes (Bernardini 2005:100). For example, a stylized deer petroglyph may be a Deer Clan symbol, but the incorporation of that petroglyph into a hunting scene would undermine the possibility.

4. *Referents*. Bernardini (2005:100) suggested that the universe from which clan symbolism was drawn was "primarily restricted to animals, plants, and meteorological phenomena." I agree, but emphasize that some clan symbols depict observations, objects, transcendental beings, and geometric shapes (see Figures 2n–2q).

5. *Redundancy*. Bernardini (2005:100) noted that "historic clan symbols are found repeatedly in a given location since clan symbols are, by definition, shared by a group of people and may be used by any member to signal identity or reference the group." For his multi-site analysis, he excluded motifs that did not appear at least three times at a given site. While I agree that intrasite redundancy can contribute to clan symbol identification (or confidence therein), no arbitrary threshold is employed here.

6. *Intrasite Distribution*. When repeated at sites, Hopi clan symbols tend to be spatially clustered, suggesting efforts to accumulate ongoing evidence of a group presence and identity (see Figure 3).

7. *Inter-Settlement Distribution*. Clan symbol motifs are unlikely to be evenly distributed between sites. Ethnographically, Hopi villages have included residents belonging to multiple clans. These clans, however, were neither evenly represented within a given village, nor proportionally represented across separate villages (e.g., Mindeleff 1891; Titiev 1944; Whiteley 1985, 1986, 1988). Bernardini (2005:100) used differences in inter-site distribution to argue that stylistic similarities reflect shared meaning rather than coincidental resemblance. By *coincidental*, I mean any explanation for stylistic similarity other than shared meaning (e.g., entoptic phenomena, independent invention). At a particular village, for example, coyote petroglyphs might accrue over the course of generations, simply because some people depicted local animals, including, from time to time, coyotes. It is reasonable to suspect that similar processes were taking place at nearby villages, resulting in similar proportions of coyote motifs. However, if the coyote motifs reference the Coyote Clan, which is unlikely to have contributed evenly to village populations, one might expect notable inter-site differences in coyote petroglyph distribution.

Exclusion of Certain Motifs

Many of the ethnographically-documented Hopi clan symbols are figurative representations of animals native to central Arizona, making it difficult to distinguish between clan-related animal symbols and animal depictions with no clan connections. For example, most of the motifs used as Hopi Lizard Clan symbols are images of lizards (e.g., Figure 4h). Similar petroglyphs are encountered throughout the Southwest, including Perry Mesa (e.g., Figure 4a). This is not to say that prehispanic lizard petroglyphs were not left by forerunners of a Hopi clan, but the motif's ubiquity and correspondence with local fauna do make the similarity less compelling. While there are hundreds, if not thousands of Perry Mesa animal petroglyphs that *could* reference the Badger, Beaver, Coyote, Bear, Deer, Mountain Sheep, Gopher, Lizard, Snake, Horned Toad, Crane, Eagle, Parrot, Bluebird, Crow, Dove, and Pigeon Hawk clans, they could just as easily have no Hopi connection. For this reason, 85 Hopi clan symbols with animal referents are excluded from the analysis. I also exclude 16 Hopi clan symbols with nondescript plant referents, as well as 10 Hopi clan symbols consisting of simple geometric motifs, such as the Snake Clan's zigzag symbol (Figure 4l) or the Sand Clan's rectangle symbol (Figure 4m). These too are found on Perry Mesa (Figures 4e, 4f), and they may reference *Hisatsinom* clans, but they are also found throughout the world (e.g., Berger 2012:Figure 6; Bradley 2002:Figure 3A). After this exclusionary process, 290 ethnographically-documented Hopi clan symbols are available for comparison. Collectively, these reference 46 Hopi clans.

Perry Mesa Sample

The Perry Mesa landscape includes an expansive and diverse assemblage of rock art, providing a wealth of research opportunities (Russell 2016; Simon et al. 2014; Stone 2006). A number of cultural resource projects on Perry Mesa have included petroglyph inventories and/or limited analyses (e.g., Ahlstrom et al. 1992; Ahlstrom and Roberts 1994; Baker and Bruder 2002; Bilsbarrow 1997; Bilsbarrow et al. 1997; Bilsbarrow and Taylor 1997; Heuett and Long 1996; Kruse-Peeples et al. 2009; North 2002, 2004; Simon and Russell 2010, 2017), and an expanding body of research is focused specifically on the area's rock art (e.g., Carpenter 2010; Harkness 2013, 2014; Huang 2006, 2009, 2010; Huang and Stone 2004; Kwiatkowski et al. 2012; Napton and Greathouse 1990; Russell and Simon 2011; Russell et al. 2011; Schoonover 2003; Simon 2012; Simon et al. 2014; Snow et al. 2012).

The analysis described in Part III involves petroglyphs from six Perry Mesa sites (see Figure 5). The most complete datasets are from Rattlesnake Egg (Napton and Greathouse 1990; Simon and Russell 2010, 2017) and Arrastre Creek (Schoonover 2003). Comparable data were collected by Snow and colleagues (2012) at Pueblo de las Mujeres, Pueblo la Plata, Lost Jupiter, and Pueblo Pato. Unfortunately, their motif frequency data

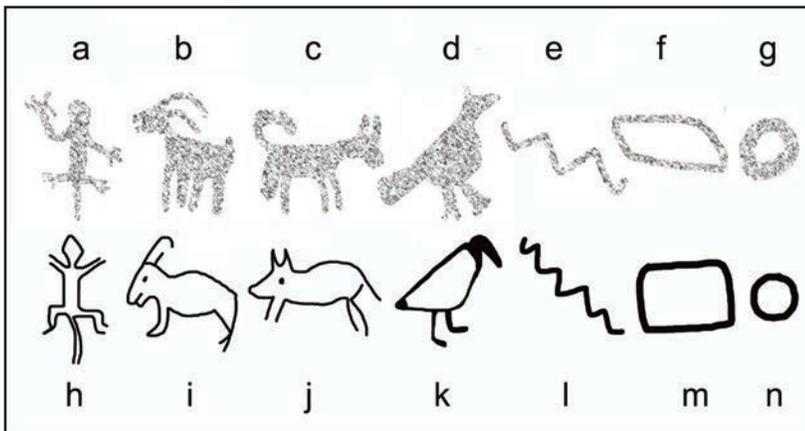


Figure 4. Examples of Perry Mesa petroglyph motifs (a-g) that resemble Hopi clan symbols (h-o), but are excluded from the analysis. (Symbols in the bottom row are associated with Lizard (h), Mountain Sheep (i), Coyote (j), Crow (k), Snake (l), and Sand (m, n) clans. Petroglyphs are from Brooklyn Basin (a, b, d, f), Rattlesnake Egg (e, g), and Arrastre Creek (c). (Bottom row after Bernardini 2002 [l, n], Colton and Colton 1931 [i-k, m], and Malory 1886 [h]).

were subsequently lost, preventing standardization. However, lists of potentially-identified clans, per site, have been preserved. Anecdotal information from the Brooklyn Basin area is also presented.

Rattlesnake Egg. Rattlesnake Egg (NA11785), located on the south rim of Perry Tank Canyon, includes a small masonry pueblo (25-30 rooms), a short ceremonial racetrack, a number of bedrock grinding features, and an extensive petroglyph assemblage (Russell 2014; Russell and Freeman 2010; Simon et al. 2014; Simon and Russell 2010, 2017). Surface artifacts suggest occupation during the late 1200s and early 1300s. A total of 561 petroglyphs have been documented (Napton and Greathouse 1990; Simon and Russell 2010, 2017).

Arrastre Creek. The Arrastre Creek (AZ N:16:62 [ASM]) site is located in the central portion of Black Mesa (which is generally included as part of the Perry Mesa landform). A prehispanic component here, dating to the late 1200s, includes three small masonry structures (four rooms total), a possible racetrack, and a large rock art assemblage where Schoonover (2003) and volunteers recorded over 1,000 petroglyphs.

Pueblo la Plata. Pueblo la Plata (NA11648) sits at the northeastern edge of Perry Mesa, with deposits dating from the late thirteenth into the mid-fifteenth century. The site includes a large masonry roomblock (100-150 rooms), several outlying structures, roasting pits, agricultural features, a large racetrack, and rock art

(see Ahlstrom et al. 1992:82-87; Kruse-Peebles et al. 2009; Russell 2014; Russell and Freeman 2010; Shockey and Watkins 2009; Strawhacker, this issue; Wilcox and Holmlund 2007). Eighty-two petroglyphs were recorded at Pueblo la Plata by Carpenter (2010), Kruse-Peebles and others (2009), and Simon and colleagues (2014).

Lost Jupiter. The small site of Lost Jupiter is just off the mesa, near the mouth of Baby Canyon. Dating to or before the fifteenth century, the site consists primarily of rock art and bedrock grinding features, accompanied by prehispanic pottery. Carpenter (2010) recorded and analyzed a total of 225 petroglyphs here, and her data were included in a subsequent study by Simon and colleagues (2014).

Pueblo Pato. Pueblo Pato (NA11434) dates from the late 1200s into perhaps the middle 1400s. Sitting on the northern rim of Perry Tank Canyon, in the west-central portion of Perry Mesa, the expansive site includes several roomblocks (totaling over 200 rooms), outlying structures, agricultural and food preparation features, and a rock art concentration (see Ahlstrom et al. 1992; Fiero et al. 1980:82-86, 122; Kruse-Peebles et al. 2009; North 2002:143-150; Russell 2014; Russell and Freeman 2010; Shockey and Watkins 2009; Simon et al. 2014; Strawhacker, this issue; Wilcox and Holmlund 2007).

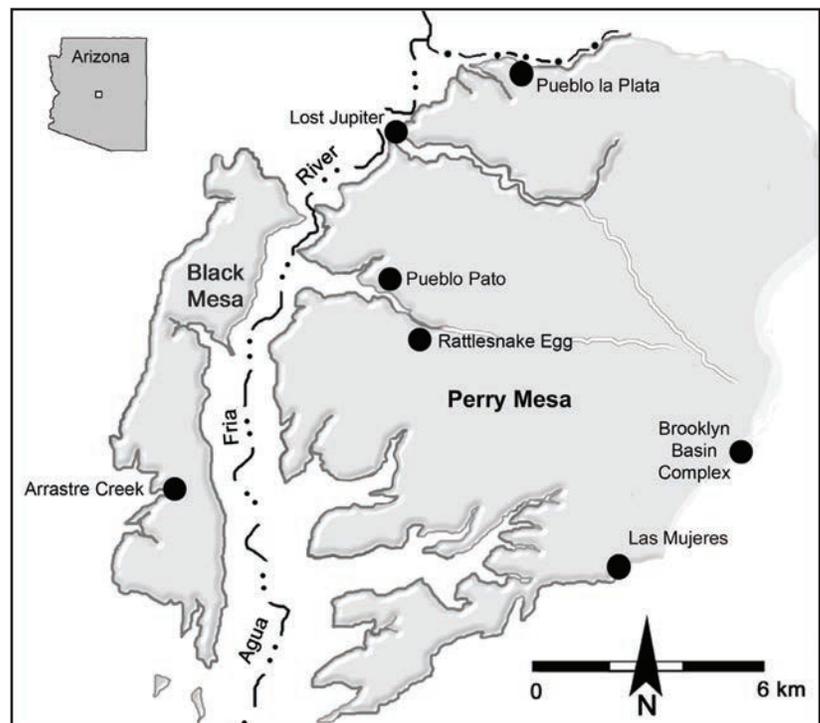


Figure 5. Perry Mesa sites discussed in this paper.

Huang (2010) recorded and analyzed a total of 170 petroglyphs at Pato, which contributed also to the work by Simon and colleagues (2014).

Pueblo de las Mujeres. The large site of Pueblo de las Mujeres (AR 03-02-01-55, NA13471), perched on the southeastern edge of Perry Mesa, contains two roomblocks (totaling 150–200 rooms), several outlying structures, two racetracks, and a number of ancillary features. The larger of the two roomblocks is surrounded by a massive stone wall, and has a large concentration of rock art on the cliff face to the east (Abbott et al. 2017; Ahlstrom et al. 1992; Ahlstrom and Roberts 1995:23-26; Kruse-Peebles et al. 2009; Russell 2014; Russell and Freeman 2010; Shockey and Watkins 2009; Wilcox and Holmlund 2007). The petroglyphs at Mujeres have yet to be systematically recorded (J. Scott Wood, personal communication, 2017). One in particular deserves mention, as it depicts a woman with Hopi-like hair whorls, wearing a Hopi *manta*-like garment (see Figure 6). David Abbott showed the petroglyph to Hopi cultural advisors, who were confident in identifying the referent as *Hisatsinom* (Simon et al. 2014:115).

The Brooklyn Basin complex (AR 03-12-01-42, AR 03-12-01-45, NA13472, NA13473) includes a cluster of pueblos (or roomblocks) that range in size and distance from one another, but represent an estimated total of 250 to 400 rooms, along with associated roasting pits, outlying structures, and ceremonial racetracks (see Abbott et al. 2017; Russell 2014, Wilcox et al. 2001:173). The adjacent cliff face hosts a dense concentration of petroglyphs, some of which have been recorded by volunteers. Collected data are on file with the Tonto National Forest. Their efforts, though herculean, have addressed only a small portion of Brooklyn Basin's rock art assemblage, preventing frequency standardization for the time being.

Sample Dating. At present, there is no established method for the absolute dating of petroglyphs exposed to the elements. Archaeologists generally rely on relative dating methods, such as spatial association with diagnostic features or artifacts, iconographic parallels with datable media, relative reflectivity, and motif content. All of the petroglyphs considered in Part III are thought to predate 1450 CE, given their frequent asso-



Figure 6. Large petroglyph at Pueblo de las Mujeres (left) compared with historic photograph of Hopi woman (right). (illustration after photograph by Joshua Watts [Simon et al. 2014:Figure 5.15]; photograph by Adam Clark Vroman, ca. 1901, courtesy of the Peabody Museum of Archaeology and Ethnology, Harvard University, PM# 975-67-10/100539.1.81).

ciation with prehispanic pottery and bedrock grinding features. All but one of the petroglyph concentrations are directly associated with prehispanic architecture. The exception is Lost Jupiter, where petroglyphs are accompanied by bedrock metates and prehispanic pottery, suggesting rough contemporaneity with several nearby, prehispanic settlements.

Each of the petroglyph assemblages in my sample includes motifs and designs found elsewhere, in datable, prehispanic media (e.g., textiles, ceramics). All of the sampled petroglyphs exhibit advanced repatination, setting them apart from historic petroglyphs, encountered rarely in the area. None of the analyzed petroglyphs reference or interact with post-contact introductions, such as firearms and horses.

Expectations

The seven criteria presented above engender several expectations. If some of Perry Mesa's petroglyphs are *Hisatsinom* clan symbols, I would expect to observe not only stylistic similarity, but also differences in clan representation, clan distribution, motif frequency, motif cooccurrence, petroglyph clustering, and southern association.

Clan Representation. Of the 165 clans in my comprehensive Hopi clan inventory, clan symbols have been identified ethnographically for 52. Many of these 52 clans have two or more symbols, some of which are excluded from the analysis. Nevertheless, all 52 clans with known clan symbols have at least one symbol that is retained for comparative purposes. If the Perry Mesa motifs in question are *Hisatsinom* clan symbols, I would expect them to reference a relatively small subset of these 52 clans. If the resemblance between Perry Mesa motifs and Hopi clan symbols is coincidental, I would expect a broader, stochastic correlation.

Clan Distribution. Because Hopi clans are exogamous, clan membership is matrilineal, and post-marital residence is matrilineal, every Hopi village includes members of multiple clans. Villages do not, however, have members of every clan. Rather, various clan combinations emerge in different villages, and these combinations can change with every death or wedding (e.g., Cameron 1992; Mindleff 1891). If the Perry Mesa petroglyphs in question do represent *Hisatsinom* clans, I would expect site-scale combinations to vary from one site to the next.

Motif Frequency. The residents of a Hopi village are not divided equally among clans. One clan (or a small alliance of affiliated clans) can dominate the village's populace. Thus, if the Perry Mesa motifs are clan symbols, I would expect to encounter them in asymmetric proportions from one site to the next.

Motif Cooccurrence. Over the centuries, particularly strong relationships have developed between specific Hopi clans. Voth (1905:109), for instance, discusses the intimate connection between the Sun and Moon clans.

Iconographic evidence suggests a similar nexus between the Arrow and Reed clans (see Bernardini 2007; Colton and Colton 1931). A number of clans use two or more clan symbols that bear no resemblance, but which convey the same social message. For these reasons, I would expect to encounter instances of motif cooccurrence (e.g., Reed and Arrow motifs) within and across sites. If the resemblance between Perry Mesa motifs and Hopi clan symbols is coincidental, I would expect no such pattern.

Motif Clustering. Because Hopi clan symbols represent a social collective, and Hopi clan symbol petroglyphs reference an individual member's contribution to this collective, it is often the case that clan symbol petroglyphs will be spatially clustered within a site, such that similar symbols will accumulate, along with other motifs used by the same clan, and alongside those of affiliate clans. Thus, if the Perry Mesa motifs are *Hisatsinom* clan symbols, I would expect them to be similarly clustered, rather than spread throughout a site.

Southern Association. Some Hopi migration narratives discuss southern homelands, ostensibly to the south of Perry Mesa. One could argue that clans with such histories are more likely to have traveled through central Arizona than are those with homelands elsewhere. Thus, if the petroglyphs in question are *Hisatsinom* clan symbols, I would expect to find southern clans disproportionately represented. Given the circuitous nature of migration accounts, and other problematizing factors detailed in Part I, it is unlikely that all referenced clans would be from the south.

PART III: COMPARING PERRY MESA PETROGLYPHS TO HOPI CLAN SYMBOLS

In this section, I compare the above-described sample of Perry Mesa motifs to established Hopi clan symbols. To reiterate, my analysis does not include basic geometric shapes (e.g., circles), ubiquitous motifs (e.g., zigzags), or most depictions of local animals (e.g., deer), even though many of the excluded petroglyphs could have referenced *Hisatsinom* clans.

As shown in Table 1, petroglyph assemblages at all six of the sampled sites included some motifs that resemble Hopi clan symbols. All told, 15 *Hisatsinom* clans are potentially represented. An example of each is shown in Figure 7, alongside Hopi clan symbol exemplars. At present, frequencies of particular motifs are available only for Rattlesnake Egg and Arrastre Creek, while potentially-represented clans are recorded only as present or absent at the four other sites.

Rattlesnake Egg. Of the 561 petroglyphs recorded at Rattlesnake Egg, 50 were retained as possible clan symbols, potentially representing nine clans: Bow, Moon, Bear, Strap, Badger, Oak, Butterfly, "Coati", and "Rabbit Ears" (see Table 1). Migration narratives have been re-

Table 1. *Hisatsinom* Clans Potentially Represented on Perry Mesa

Clan ^a	Homeland ^b	Hopi Name	Motifs Frequency per Site					
			Rattlesnake Egg ^c	Arrastre Creek ^d	La Plata ^{e,f}	Lost Jupiter ^{e,f}	P. Pato ^{e,f}	Mujeres ^f
Strap	Palatkwapi ^{g,h}	Piqöngyam ^{g,h}	6	18	0	0	0	0
Corn ⁱ	Palatkwapi ^{j,k,l,m,n}	n.d. ⁱ	0	6	Pres.	0	0	Pres.
“Coati” ^{q,r}	n.d.	n.d.	10	6	0	0	0	0
“Rabbit Ears” ^{q,r}	n.d.	n.d.	2	3	0	0	0	0
“Raptor” ^s	n.d.	n.d.	0	0	0	0	0	Pres.
Reed	Palatkwapi ^g , Muiobi ^j	Paaqapngyam ^h	0	0	0	Pres.	0	0
Arrow	n.d. ^o	n.d.	0	3	0	0	0	0
Sun	Palatkwapi ^{g,h} , Muiobi ^{j,l}	Taawangyam ^{g,h}	0	0	0	0	Pres.	0
Bear	Palatkwapi ^{g,h,n} , Muiobi ^j	Honngyam ^h	7	2	0	0	0	0
Bow	Palatkwapi ^{g,h} , Muiobi ^j	Awatngyam ^h	9	23	0	0	0	0
Badger	Palatkwapi ^{g,h} , Muiobi ^j	Honangyam ^h	3	5	0	0	0	0
Oak ^q	Muiobi ^p	Kwingyap ^t	3	20	0	0	0	0
Butterfly	Muiobi ^j	Pounyam ^l	1	33	0	Pres.	0	Pres.
Moon ^q	Muiobi ^{l,u}	n.d.	9	3	Pres.	Pres.	Pres.	Pres.
Fire	Kawestima ^h	Kookopngyam ^h	0	21	0	Pres.	Pres.	Pres.

- a. *Hisatsinom* clans, the self-referential symbols of which are consistent with Perry Mesa petroglyph motifs.
- b. Clan homeland, *Ongtupqa* notwithstanding, from which clan departed for *Tuuwanasavi*
- c. Napton and Greathouse 1990; Simon and Russell, 2017.
- d. Schoonover 2003
- e. Carpenter 2010
- f. Snow et al. 2012
- g. Ferguson 2003
- h. Lyons 2003
- i. According to Nequatewa (1967:134-135), the Corn Clan was at one point renamed *Oomawngyam* (Cloud Clan). It later subdivided into the *Nuvangyam* (Snow Clan) and *Pikyas wungwa* (Wilted Corn Clan).
- j. Fewkes 1900
- k. Mindeleff 1891
- l. Michaelis 1981
- m. LaVern Siweumtewa, in Ferguson and Lomaomvaya 1999:89-90
- n. Patrick Lomawaima, in Ferguson and Lomaomvaya 1999:93
- o. There is little agreement on whether the Reed Clan and Arrow Clan were, in fact, a single entity. Michaelis (1981) lists them as distinct, whereas Fewkes (1900) referred to a single clan, *Pakab Wiñwû*, which he translated as “Reed or Arrow Clan.” Lyons (2003) gives the Reed Clan’s Hopi name as *Paqapngyam*, which is similar to Fewkes’ *Pakab Wiñwû*. Strikingly similar clan symbols have been attributed to both clans (e.g., Figures 2d and 2e). A particular set of petroglyphs at Tutuveni, in fact, was originally attributed to the Reed Clan (Colton and Colton 1931), but Bernardini (2009) has since suggested that the motifs were left by Arrow Clan members. For the present analysis, I treat the two groups as distinct clans. There are no available data concerning the Arrow Clan’s homeland. Given the evidence of close association between (if not synonymy of) the Reed and Arrow clans, I assume similar migration paths.
- p. Robbins et al., 1916:44
- q. Now extinct (Bernardini 2002, 2005, 2007; Colton and Colton 1931; Michaelis 1981)
- r. The “Coati” and “Rabbit Ears” motifs were identified by Bernardini (2002, 2005, 2007) and Hopi consultants as likely symbolic of two now-extinct *Hisatsinom* clans, the names of which are not known; Bernardini’s terminology is used here. Both motifs have been recorded in the Phoenix Basin (Russell and Wright 2009), on Perry Mesa (Russell and Nez 2012; Simon et al. 2014), and at the established *Hisatsinom* site of Homol’ovi (Homolovi IV; Bernardini 2002), all being south of *Tuuwanasavi*. The “Rabbit Ears” motif has also been recorded at the established *Hisatsinom* sites of *Nuvakwewtaka*, Pollock (NA4317), and Kinnikinick (NA1629), also south of *Tuuwanasavi*. Thus, I infer that if these were *Hisatsinom* clans, they are most likely to have been affiliated with migration from the south.
- s. The “Raptor” motif occurs sparingly at Tutuveni, where Bernardini (2007) and Hopi consultants have identified it as likely symbolic of a now-extinct *Hisatsinom* clan. Its presence at *Tutuveni* probably reflects pilgrimage from *Tuuwanasavi* to *Ongtupqa*, after the clan’s migration had ended. All other recorded instances of the “Raptor” motif in petroglyph form are on Perry Mesa, to the south of *Tuuwanasavi*. A forthcoming paper (Russell et al., 2018) argues that as an *Hisatsinom* clan symbol, the “Raptor” motif was materialized also in the form of mosaicked objects (e.g., Jernigan 1978:Plate 8). The distribution of these objects is wide, but certainly concentrated in the Phoenix Basin and Verde River Valley (Billideau 1986; Wilcox 2003a, 2003b).
- t. Hodge 1907:748
- u. Voth (1905:109) reported that the Moon Clan and Sun Clan were closely related, raising the possibility that the former, like the latter, may have been associated with both *Palatkwapi* and *Muiobi*. However, Voth did not expound on the nature or strength of their relationship.

corded for the first seven. The Strap Clan is associated exclusively with *Palatkwapi*. Migration histories that pertain to the Bear, Bow, and Badger clans suggest at least two proto-clans, leaving *Palatkwapi* and *Muiobi*, respectively. The Oak, Butterfly, and Moon clans are associated exclusively with *Muiobi*. No migration accounts exist for the now-extinct “Coati” and “Rabbit Ears” clans, but both motifs have been encountered in the South Mountains of Phoenix (Russell and Wright 2009), elsewhere on Perry Mesa (Russell and Nez 2012; Simon et al. 2014), and at *Homol’ovi* (IV; Bernardini 2002, 2005). “Rabbit Ears” symbols were also found at *Nuvakwewtaqa*, Pollock (NA4317), and Kinnikinick (NA1629) (Bernardini 2002, 2005). All of these sites are located south of *Tuuwanasavi*.

Arrastre Creek. At Arrastre Creek, 143 petroglyphs resemble symbols affiliated with 12 clans: Butterfly, Bow, Oak, Strap, Badger, Moon, Bear, Arrow, Corn, Fire, “Coati,” and “Rabbit Ears” (see Table 1), 10 of which have ethnographically-identified homelands. Strap and Corn clan histories refer only to *Palatkwapi* (Ferguson 2003; Fewkes 1900; Lyons 2003; Michaelis 1981; Min-

deleff 1891), whereas both *Palatkwapi* and *Muiobi* are listed as Bear, Bow, and Badger clan homelands (Ferguson 2003; Fewkes 1900; Lyons 2003; Michaelis 1981; Mindeleff 1891). While there are no migration accounts specific to the Arrow Clan, there is ample evidence of a strong connection between this and the Reed Clan, and some indication that the two were at some point merged (see Table 1:note o). Thus, for analytical purposes, the Arrow Clan’s homeland status mirrors that of the Reed Clan. The Oak, Butterfly, and Moon clans are connected through oral tradition only to *Muiobi* (Fewkes 1900; Michaelis 1981; Robbins et al., 1916:44), while the Fire Clan is linked with *Kawestima* alone (Lyons 2003).

As an aside, I also note that 11 Katsina-like petroglyphs were recorded at Arrastre Creek (see Figure 8a-k). These were excluded from the analysis primarily because I could not confirm that they were, in fact, referencing *Katsinam*, and if so, whether they were affiliated with an *Hisatsinom* Katsina clan.

Anecdotal Data. Snow and colleagues (2012) found that some of the 82 petroglyphs recorded at Pueblo la Plata (Carpenter 2010) resemble symbols used by the Hopi Corn (*Palatkwapi*) and Moon (*Muiobi*) clans. At Lost Jupiter (Carpenter 2010), they identified some of the site’s 225 petroglyphs as consistent with Reed (*Palatkwapi*, *Muiobi*), Butterfly (*Muiobi*), Moon (*Muiobi*), and Fire (*Kawistima*) clans. Of the 170 petroglyphs recorded at Pueblo Pato (Huang 2010), Snow and others (2012) identified motifs consistent with symbols used by the Sun (*Palatkwapi*) and Moon (*Muiobi*) clans, which Voth (1905:109) reported as being particularly connected. Working at Pueblo de las Mujeres, Snow and colleagues (2012) identified four petroglyph motifs that resemble symbols used by the Corn (*Palatkwapi*), Butterfly (*Muiobi*), Moon (*Muiobi*), and Fire (*Kawestima*) clans.

The “Raptor” Motif

In Part II, I described the approach taken by Bernardini (2002, 2005, 2007) to recognize prehispanic petroglyphs that are likely to have referenced now-extinct *Hisatsinom* clans. During the course of the present analysis, a motif fitting these criteria was identified along the southeastern edge of Perry Mesa (see Figures 9 and 10). In form, it resembles the outline of a bird with wings spread. These are most prevalent at the Brooklyn Basin complex, but found also at Pueblo de las Mujeres, where the motif grades into a Greek cross. The petroglyphs are frequently clustered together, not unlike the rock art at *Tutuveni* (compare Figures 3 and 9), where Bernardini (2007:Figure 3.11f) has recorded six comparable petroglyphs (see Figure 10i). Their abstract nature, standardized form, redundancy, clustering, and presence at *Tutuveni* suggest reference to a now-extinct clan. A series of similarly-shaped, mosaicked artifacts have been found throughout the Southwest (e.g., Fig-

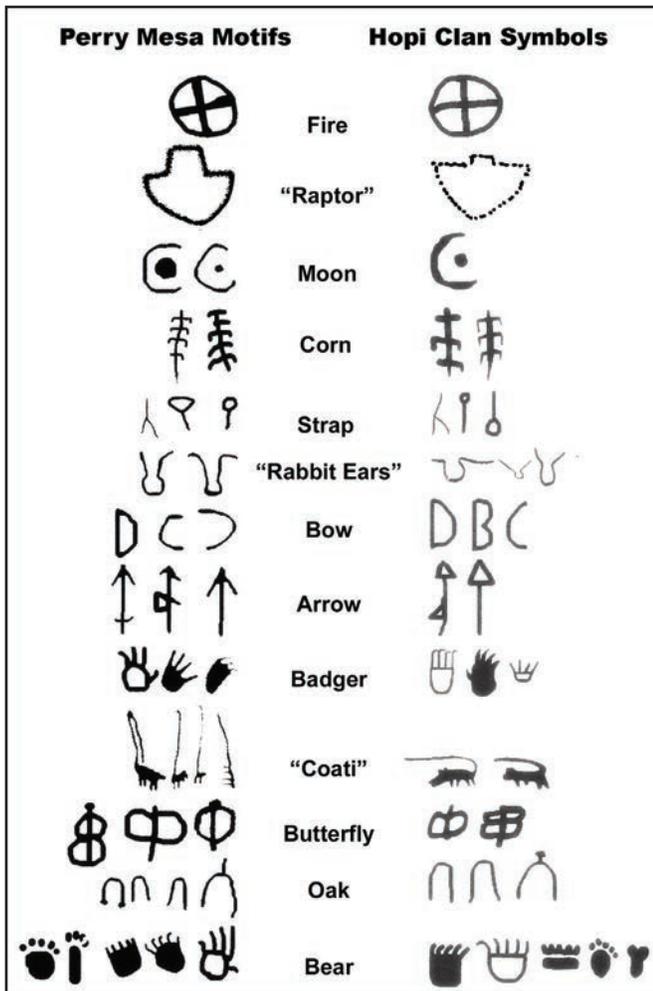


Figure 7. Examples of Similarity between Perry Mesa Motifs and Hopi Clan Symbols.

ures 10g—h; see Billideau 1986; Wilcox 2003b). In their jewelry form, Wilcox (2003a) refers to these as “raptorial birds,” leading to my use of “raptor” in reference to the petroglyphs. A forthcoming article suggests that the “raptor”-evoked *Hisatsinom* clan eventually transformed into a wider ritual sodality, referenced by the raptorial bird mosaics (Russell et al., 2018).

Comparisons and Patterns

Several patterns emerge from the observations above. These involve differences in motif selection, spatial distribution, relative frequency, cooccurrence, and migration history. None are consistent with a coincidental explanation for resemblance. These patterns are presented below, relative to the expectations listed in Part II.

Stylistic Similarity. The comparison of Perry Mesa’s rock art to Hopi clan symbols has identified a number of compelling similarities. At Rattlesnake Egg, for example, nearly 70 percent of the petroglyphs are similar to known clan symbols. Most such cases involve simple shapes, ubiquitous designs, or local animal life (see Figure 4). To reduce the chances of misidentification, all matches involving such motifs are eliminated from consideration. Nevertheless, I am left with a compelling number of retained petroglyphs that resemble ethnographic and archaeological exemplars of Hopi clan symbols (see Table 1, Figure 7).

Clan Representation. If the similarities between Perry Mesa petroglyphs and Hopi clan symbols are the result of coincidence, I would expect this coincidence to involve a wide, representative sample of Hopi clans. As described above, 290 ethnographically-documented Hopi clan symbols were retained for comparison, rep-

resenting 46 different clans. Thirty of the 290 exemplar motifs (10.3 percent) were encountered within my sample (see Figure 7 for the most commonly-encountered), whereas 260 were entirely absent. Of the 260 clan symbols not encountered in my sample, 139 are associated with clans not included in Table 1. A sample of these is shown in Figure 11. Of the 46 clans that could have been recognized by way of my methodology, only 12 potentially (26.1 percent) were, a fraction that argues against coincidental resemblance.

Clan Distribution. Coincidental explanations for motif similarity are likely to produce fairly uniform distributions over the course of Perry Mesa’s 200-year occupation. For example, if the bear paw petroglyphs on Perry Mesa played a role in hunting magic rather than clan identity, I would expect to encounter them at most pueblos, given that most pueblos likely included hunters among their residents. Within my sample, however, Bear Clan-consistent motifs appear at only two out of six sites.

Motif Frequency. Coincidental explanations are also likely to engender similar motif frequencies across sites. That is, two similarly-sized rock art assemblages should end up with comparable numbers of coincidentally-produced motifs. Again, however, this is not the case. Petroglyphs resembling Butterfly Clan symbols, for example, are present at both Rattlesnake Egg ($n = 33$) and Arrastre Creek ($n = 1$), but in strikingly different proportions. To assess such differences, I consider the nine clans that are potentially represented at both of the two sites. For each of the nine clans, I determine the degree to which its motif contributes to each site’s overall assemblage of potential clan symbols. Returning to the Butterfly Clan example, Rattlesnake Egg’s 33 consistent motifs make up 66 percent of the site’s 50 suspected clan symbols. In contrast, Arrastre Creek’s one consistent motif accounts for less than 1 percent of that site’s 113 suspected clan symbols. Differences in proportion are compared using a series of two-tailed Fisher’s Exact tests. Frequency, proportion, and probability values are provided in Table 2. Results indicate that inter-site differences in the potential representation of five clans – Oak, Bear, Butterfly, Moon, and “Coati” – have a low probability of resulting from chance ($p < 0.05$, $Q > 0.54$). It is interesting to note that at least three of these clans (Oak, Moon, and Coati) are now extinct (Bernardini 2002, 2005; Michaelis 1981).

Motif Cooccurrence. Coincidental explanations are unlikely to produce patterns involving motif co-occurrence. For example, petroglyphs that coincidentally resemble Moon Clan symbols are unlikely to accompany those that coincidentally

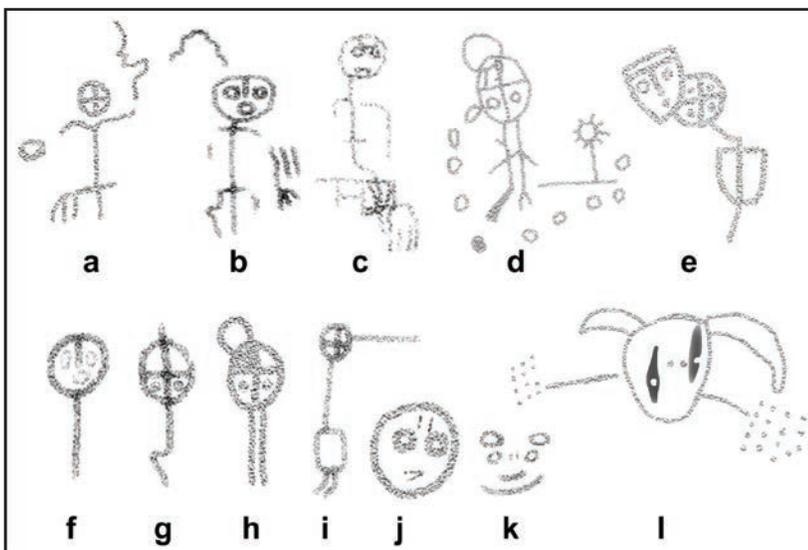


Figure 8. Sample of Perry Mesa petroglyphs that may reference *Katsinam* (8a-k from Arrastre Creek; 8l from Brooklyn Basin. Note lightning-like motif with 8a and cloud-like motif with 8b. Dark, lanceolate shapes in 8l are natural cavities in the stone, possibly incorporated as eyes. Not to scale.)

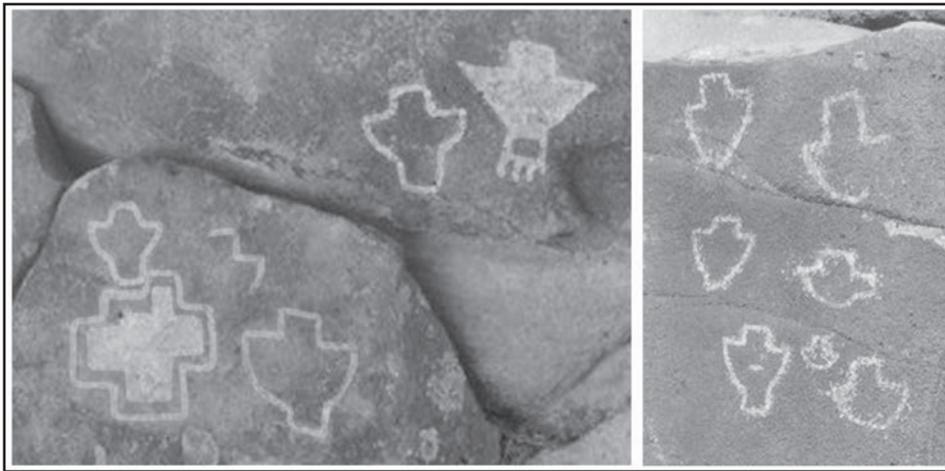


Figure 9. Two “Raptor” Motif Concentrations at Brooklyn Basin. (Petroglyph values enhanced digitally. Not to scale).

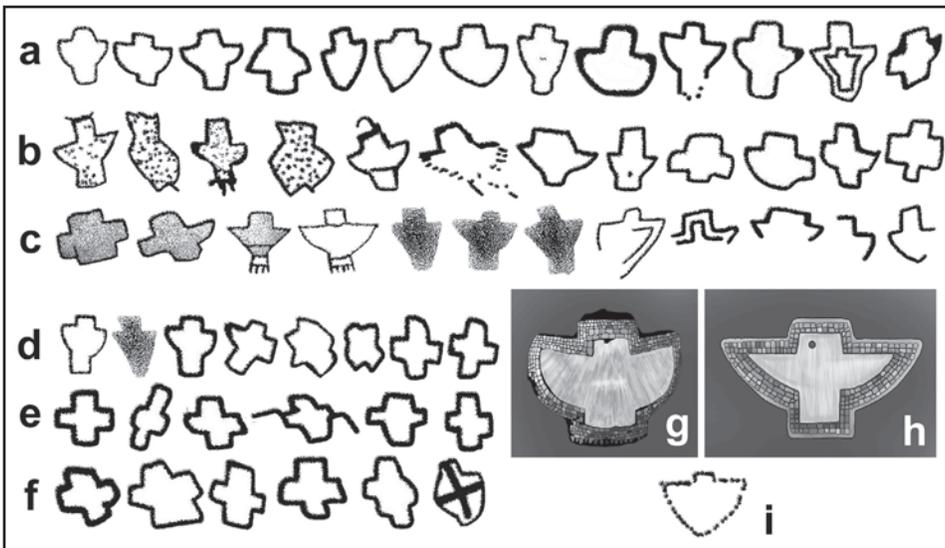


Figure 10. Sample of “Raptor” motifs from Brooklyn Basin (rows a-c) and Pueblo de las Mujeres (rows d-f), compared to contemporaneous pendants from Casa Grande (g) and Ridge Ruin (h), as well as Bernardini’s “Extinct-6” motif from Tutuveni. (Figure 10g after Wilcox et al 2008:Figure 16; Figure 10h after McGregor 1943:Plate II.1; Figure 10i after Bernardini 2007:Figure 3.11 f).

resemble Strap Clan symbols any more than they would those that coincidentally resemble Badger Clan symbols. Again, however, this is not the case (see Table 3). Arrow Clan symbols and Bow Clan symbols, for example, never occur except in tandem. All such inseparable pairs are shaded in Table 3b. In other cases, clan symbols co-occur sometimes (e.g., Badger and Corn) or never (e.g., Reed and Oak). The range of variability is consistent with the Hopi practice of grouping various clans into unnamed social collectives, which anthropologists refer to as *phratries*. The consistent co-occurrences on Perry Mesa suggest a possible phratry comprised of the Bow, Arrow, Badger, “Coati”, Butterfly, Moon, Oak, “Rabbit Ears,” Bear, and Strap clans. Several of these, during ethnographic times, have been listed as phratry-mates

or otherwise associated (Fewkes 1900; Lyons 2003; Titiev 1944).

Petroglyph Clustering. Though not quantified, I can report that Perry Mesa petroglyphs that are tentatively identified as Hopi clan symbols are generally clustered within sites, not unlike the “Raptor” motifs shown in Figure 9. I have also noticed nuanced differences in where these clusters tended to accrue. At Rattlesnake Egg, for instance, petroglyphs consistent with Oak Clan symbols were clustered on mesa-top, bedrock outcroppings, adjacent to grinding features. Those corresponding with Bear Clan symbols were clustered at the upper edges of the cliff face, and those resembling Strap Clan symbols were most often near the base of the escarpment (Simon and Russell 2017).

Southern Connections. The use of traditionally-maintained clan itineraries to assess stylistic similarities is problematic for a number of reasons. Clan migration narratives are not consistently available to the archaeologist, and when they are accessible, they often include contradictory elements or multifaceted and divergent strands. The multi-generational movements they describe are circuitous, seldom involving a predetermined route or geographically-identified destination. Thus, clans leaving *Palatkwapi* cannot be assumed to have passed through the Perry Mesa region. Nor can the possibility of non-southern clans circling through central Arizona be ruled out. Nevertheless, I would expect to encounter more evidence of southern clans to the south of *Tuuwanasavi* than I would northern, eastern, western, or autochthonous clans. Ideally, differences in homeland representation could be standardized and compared in order to determine whether southern clans are disproportionately represented on Perry Mesa as compared to the Hopi clan inventory. In practice, however, this approach is unsound, given that (a) many of the sampled petroglyphs (corresponding with a large number of

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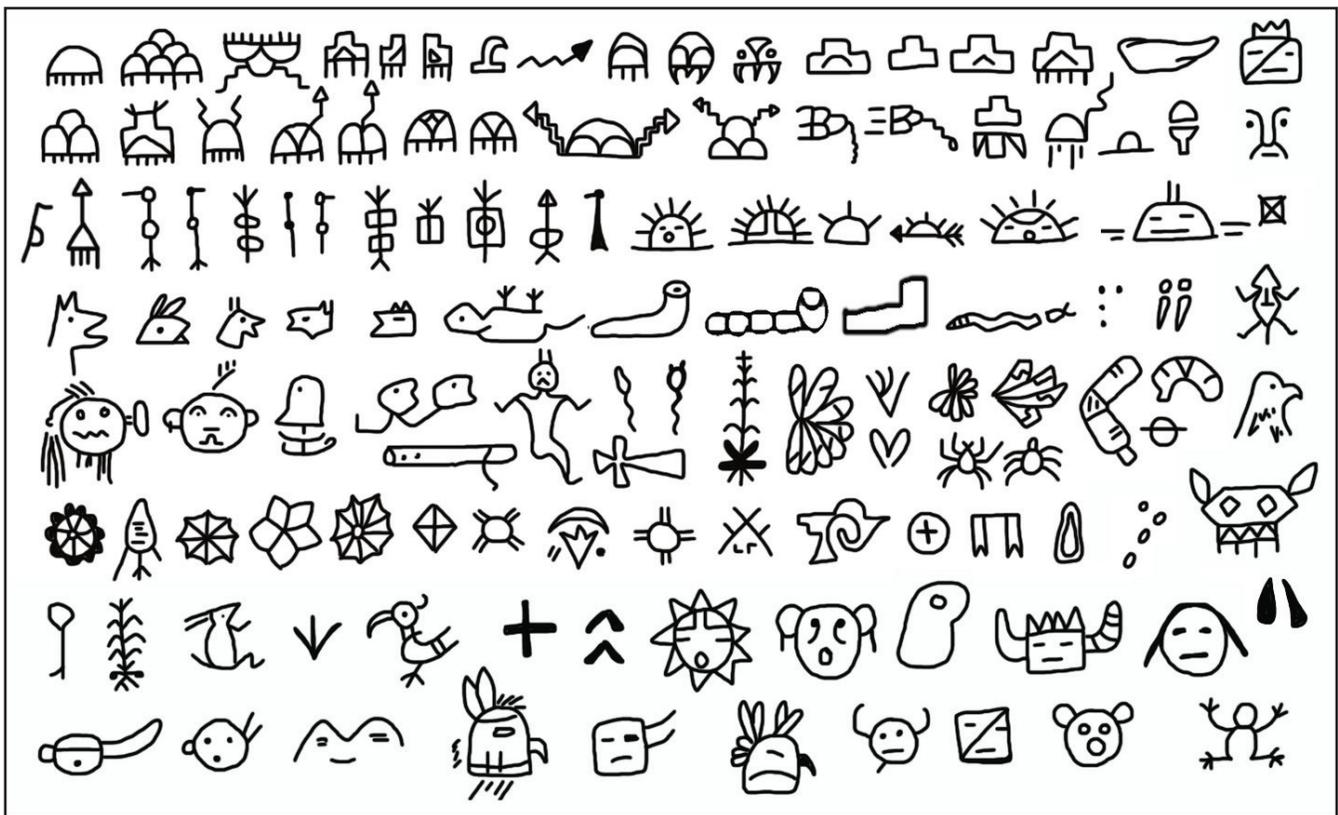


Figure 11. Sample of Hopi Clan Symbols that Were Retained for Analysis and Associated with Clans Other than Those in Table 1, but Which were Not Encountered within the Sample. Note that Similarities between Motifs in this Table Do Not Necessarily Indicate that Similar Motifs were Associated with the Same Clan (after Russell and Wright 2009:Figure 1).

potentially-represented clans) were excluded from the sample, (b) clan symbols have not been recorded for all known Hopi clans, and (c), not all Hopi clans have ethnographically-recorded migration accounts. All this having been said, it is worthwhile to note that two of the clans potentially represented on Perry Mesa are linked only to the homeland of *Palatkwapi*, and six have multifaceted accounts that include *Palatkwapi*. There are no migration accounts available for the extinct “Coati,” “Rabbit Ears,” and “Raptor” clans, but their motifs are encountered almost exclusively to the south of *Tuwanasavi* (see Bernardini 2002, 2005; Russell et al. 2018; Russell and Wright 2009; Russell and Nez 2012; Simon et al. 2014). Thus, at least half (and potentially as much as 73 percent) of the potentially-represented clans on Perry Mesa have demonstrable ties to the south, whereas only four out of 15 lack any southern association.

CONCLUSION

Though not alone, some Hopis recognize cultural ties between themselves and those who lived for a time on Perry Mesa (Spielmann 2005), and there is an increasing body of supporting archaeological evidence (e.g., Bernardini 2014; Russell and Nez 2012). Given the unique nature of *Hisatsinom* mobility and

clan symbolism, Hopi histories are perfectly situated to aid in the development of archaeologically testable hypotheses (Bernardini 2005; Dongoske et al. 1993; Ferguson 2003; Spielmann 2005). Specific to the examination of potential clan symbols, Bernardini (2005, 2007), Ferguson (2003; Ferguson and Lomaomvaya 1999), Colwell (Colwell-Chanthaphonh and Ferguson 2006), Lyons (2003) and others have advanced our recognition and understanding of not only *Hisatsinom* movement, but social structure, identity, and the navigation of a rapidly-changing landscape.

As Bernardini (2002, 2005, 2007, 2008) has shown, research focused on Hopi clan symbols can be especially productive in the context of changing *Hisatsinom* culture and the relatively recent emergence of a *Hopi* identity. His work in northern Arizona has advanced our ability to make increasingly confident inferences. At the end of the day, however, there is no getting around the fact that some prehispanic petroglyphs *might just look like* the totemic symbols sketched by Mallory (1886), Fewkes (1900) and others. Skepticism notwithstanding, a good portion of Perry Mesa’s petroglyphs do, in fact, resemble Hopi clan symbols. It is hard to consider all of these, because many are ubiquitous, simplistic, and more parsimoniously explained. Others, however, are differ-

Table 2. Inter-Site Comparison of Potential Clan Symbol Frequency

Clan	Rattlesnake Egg		Arrastre Creek		Proportional Difference	Probability ^a	Strength ^b
	Number	Proportion	Number	Proportion			
Bow	9	18.0%	23	20.4%	2.4%	0.83	--
Badger	3	6.0%	5	4.4%	1.6%	0.70	--
"Rabbit Ears"	2	4.0%	3	2.7%	1.3%	0.64	--
Strap	6	12.0%	18	15.9%	3.9%	0.63	--
Oak	3	6.0%	20	17.7%	11.7%	0.05	0.54
Bear	7	14.0%	2	1.8%	12.2%	<0.01	0.80
Butterfly	1	2.0%	33	29.2%	27.2%	< 0.01	0.91
Moon	9	18.0%	3	2.7%	15.3%	<0.01	0.78
"Coati"	10	20.0%	6	5.3%	14.7%	<0.01	0.63
<i>Total</i>	<i>50</i>	<i>--</i>	<i>113</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>

a P-values, determined by two-tailed Fisher's Exact test

b Q-values, determined by Yule's Q test

ent – so idiosyncratic and faithfully reproduced that coincidental resemblance seems less likely. Hopi clan symbols are their closest, if not only, stylistic analogs, and their placement upon the landscape is no less comparable. Their distribution, at multiple scales, is asymmetric, clustered on certain panels and concentrated at certain sites. These concentrations are not only consistent with established practices at *Tutuveni* and elsewhere, but indicative in their own right of accumulation and redundancy. Over time, that is, multiple individuals went to the same places and left the same marks, contributing to a trail of deepening footprints on the landscape, while simultaneously establishing and reestablishing their connections to those symbols and their meanings, both unique and shared alike. I note also that the manufacture of Perry Mesa's suspected clan symbols was contemporaneous with that of similar motifs at more northern sites (Bernardini 2002, 2005), with established connections to Hopi (e.g., *Nuvakwewtaqa*, *Homol'ovi*). In several cases, the Perry Mesa motifs are found at sites with substantial amounts of Hopi yellow ware (Shockey and Watkins 2009; Wilcox and Holmlund 2007), which has been traced back to the Hopi Mesas (Bernardini 2014), and serves as yet another line of connective evidence.

Relatively little of Perry Mesa's rock art has been systematically recorded, and only a fraction of that analyzed. The data used in this analysis are less than robust, and my results are far from conclusive. My goal with this paper is to demonstrate the inherent potential that Perry Mesa's rock art represents. It is my hope that the issue of *Hisatsinom* iconography on Perry Mesa is revisited, using a more robust sample and methodological improvements. Future work should prioritize collaboration with members of the Hopi community, incorporating their voice in the interpretation of their history.

Finally, I emphasize that nothing in this paper is intended to suggest that the prehispanic settlements of Perry Mesa were established or populated by *Hisatsinom* elements alone. It remains clear to me that the Perry Mesa Tradition (much like the Hopi tradition), drew together a wide variety of groups (Russell and Nez 2012). When people eventually left the mesa, it seems likely that they went in several directions, contributing ultimately to a variety of descendant communities.

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Table 3. Motif Co-occurrence

Table 3a (Appearance)						Table 3b (Rate of Co-occurrence [%])																
	P. La Plata	Lost Jupiter	P. Mujeres	R. Egg	Arrastre Cr.	P. Pato		Strap	Corn	"Coati"	"Rabbit Ears"	"Raptor"	Reed	Arrow	Sun	Bear	Bow	Badger	Oak	Butterfly	Moon	
Strap																						
Corn							Corn	50														
"Coati"				✓	✓		"Coati"	100	33													
"Rabbit Ears"				✓	✓		"Rabbit Ears"	100	33	50												
"Raptor"			✓				"Raptor"	0	33	0	0											
Reed	✓						Reed	0	0	0	0	0										
Arrow					✓		Arrow	50	33	50	50	0	0									
Sun						✓	Sun	0	0	0	0	0	0	0								
Bear			✓	✓			Bear	100	33	100	100	0	0	100	0							
Bow			✓	✓			Bow	100	33	100	100	0	0	100	0	100						
Badger			✓	✓			Badger	100	33	100	100	0	0	100	0	100	100					
Oak			✓	✓			Oak	100	33	100	100	0	0	100	0	100	100	100				
Butterfly	✓	✓	✓	✓			Butterfly	100	67	100	100	100	100	100	0	100	100	100	100			
Moon	✓	✓	✓	✓	✓	✓	Moon	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Fire	✓	✓		✓			Fire	50	67	50	50	100	100	100	0	100	100	100	100	100	75	50

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STONE ROBBING AS A MEASURE OF OCCUPATIONAL HISTORY: AN EXPLORATORY ANALYSIS OF ARCHITECTURAL VARIABILITY ON PERRY MESA

Colleen Strawhacker

ABSTRACT

The concentration of population on Perry Mesa, occurring in the late AD 1200s until the mid-1400s, has been the focus of many questions regarding processes leading to the construction of large pueblos on the Perry Mesa landscape. In addition to these large pueblos – some consisting of over 100 rooms – recent archaeological surveys have located many small room blocks surrounding the pueblos. Analysis of these outlying structures, comprised of one to ten rooms, around two large pueblos on Perry Mesa (Pueblo la Plata and Pueblo Pato) provides insight into the occupational histories and community development of the pueblos and their surrounding room blocks. Several characteristics of these small room blocks can provide information on timing of construction, community development, and patterns of aggregation on Perry Mesa. Architectural variables of the small room blocks that are analyzed here include number of rooms, area of the room block (m²), mound height (cm), and the proportion of shaped stone used in construction. Data from small room blocks around Pueblo la Plata and Pueblo Pato show distinct differences between these two arguably contemporaneous and otherwise similar communities, suggesting that both have different occupational histories and patterns of aggregation. These interpretations can lead to a more in depth understanding of architectural variability across Perry Mesa and its relationship to the aggregation of the pueblos.

For decades, archaeologists working in the American Southwest have been investigating the reasons for and consequences of population aggregation. Survey and excavation data across the region have demonstrated that large, aggregated pueblos frequently grow out of dispersed, small settlements, like in the Cibola and the northern Rio Grande regions (Adler 1996; Kintigh et al. 2004; Woosley 1986). Sometimes, however, these outlying room blocks will continue to be occupied, even after large settlements appear in the archaeological record, like in the Mesa Verde and Point of Pines regions (Cameron and Duff 2008:40-41; T. Stone 2000; Varien 1999). These aggregated pueblos and their relationship

to surrounding, smaller settlements can provide insight into patterns of aggregation and community development in that region. On Perry Mesa, in central Arizona – an area that has been the subject of intense archaeological investigation over the past decade – new survey data can inform upon the development of communities and the aggregation of people that occurred during the late AD 1200s and early 1300s – a period of rapid concentration of population into large pueblos on Perry Mesa (Kruse-Peeples et al. 2009; C. Stone 2000; Wilcox and Holmlund 2007).

Focusing on the outlying room blocks (1-10 rooms) around two large, prehispanic pueblos on Perry Mesa in central Arizona, this paper addresses the role of these small room blocks in the processes of community development and aggregation. Structures of less than 11 rooms are scattered across the U.S. Southwest and were used for a variety of functions – including seasonal field houses, storage places, year-round residences, and boundary markers (Kohler 1992). While largely under-represented in much of the archaeological literature, these structures can provide a more complete picture of community development and aggregation across an entire landscape, instead of simply focusing on the larger, aggregated pueblos themselves (Cameron 1999; Kolb and Snead 1997). What role, then, did these small room blocks play in the aggregation into larger pueblos that took place on Perry Mesa in the late AD 1200s and early 1300s, and what can they tell us about aggregation processes on Perry Mesa at that time?

This paper compares the outlying, small room blocks located around the pueblos of Pueblo la Plata and Pueblo Pato to gain insights into the prehispanic settlement and construction history on Perry Mesa. First, I look for similarities and differences in the architectural attributes of these room blocks to discern whether these room blocks may have been used for different purposes

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prehispanically. Next, I analyze the differences in the investment into the construction of these room blocks through data on mound height and stone shaping. Finally, I evaluate evidence of stone robbing at these small room blocks around both communities to understand the temporal patterning of construction across the landscape. Were these small room blocks contemporaneous with the large pueblos they surrounded, or were they constructed before the construction of a major pueblo? The analysis presented here shows that while the small room blocks at both pueblos may have been used for similar functions prehispanically, the occupational histories and patterns of aggregation of the pueblos and their surrounding room blocks diverge, leading to interesting conclusions about the concentration of populations into pueblos on Perry Mesa in the late AD 1200s.

THE PREHISPANIC OCCUPATION OF PERRY MESA, ARIZONA

Archaeological research on Perry Mesa shows a sparsely-occupied prehispanic landscape until the late AD 1200s, when a rapid florescence of aggregation into large pueblos occurs. Analysis of surface ceramic collections at a number of pueblos across Perry Mesa has resulted in the definition of the “Perry Mesa Tradition,” which typifies those pueblos that were occupied from the late AD 1200s until their abandonment in the late AD 1300s to early 1400s (Fish et al. 1975; Kruse-Peeples and Strawhacker 2012; C. Stone 2000; Wilcox et al., 2001b; Wilcox and Holmlund 2007). The construction of major pueblos, including Pueblo la Plata and Pueblo Pato, has been assigned to this cultural period. This aggregation into pueblos, on a previously sparsely-occupied landscape, has produced a number of competing hypotheses concerning why this explosion in settlement concentration may have occurred. The placement of the large pueblos on mesa edges, and their rapid construction, lead some to think that the pueblos of Perry Mesa were constructed as a defensive alliance against aggressive groups to the south (Wilcox et al. 2001a, 2001b). Others hypothesize that climate became more favorable for agriculture at this time, making Perry Mesa more attractive to farming communities, resulting in a migration of people into the area (Ingram 2014; see also Abbott and Spielmann 2006; Kruse 2007).

While parts of Perry Mesa are managed by Tonto National Forest, Pueblo la Plata, Pueblo Pato, and their outlying room blocks are located within the boundaries of Agua Fria National Monument, in semi-arid desert grassland (Figure 1). Agua Fria National Monument encompasses over 71,000 ac, approximately 80 km north of Phoenix. The monument is now primarily used for recreation, and all grazing cattle were removed from monument boundaries in 2006. According to previous archaeological research, approximately 600 prehispanic and historic sites exist within the boundaries of the monument, including

Pueblo la Plata and Pueblo Pato (Ahlstrom et al. 1992; Fiero et al. 1980; Fish et al. 1975; Kruse-Peeples et al. 2009; North 2002; Spoerl and Gumerman 1984; Wilcox and Holmlund 2007), and these sites are a part of the Perry Mesa Archaeological District in the National Register of Historic Places (National Park Service 2010).

The two pueblos of focus, constructed primarily with shaped basalt, are located on the western edge of Perry Mesa. Pueblo la Plata is a 69-room structure located close to the northern rim of Perry Mesa, between two small canyon systems (Mapes 2005:13). Situated approximately 6.5 kilometers to the southwest of Pueblo la Plata is Pueblo Pato, located on the northern edge of Perry Tank Canyon. Room counts of the five large, separate pueblo room blocks that comprise Pueblo Pato range from 10 to 125 rooms each (Ahlstrom et al. 1992:81; Wilcox 2001b:148), making it larger than Pueblo la Plata. While the architectural organizations of Pueblo la Plata and Pueblo Pato differ (see Figures 2 and 3), ceramic assemblages indicate a temporal overlap in their occupation, providing an excellent opportunity for a comparative case study between these two pueblos and their surrounding room blocks. Archaeological surveys during 2007 and 2008 mapped an abundance of previously unrecorded agricultural features and outlying room blocks of one to ten rooms around both pueblos. These surveys identified 37 prehispanic, outlying room blocks around Pueblo la Plata and 30 prehispanic, outlying room blocks around Pueblo Pato, all of which form the basis of study for this paper (see Figure 4 for an example; Kruse-Peeples et al. 2009).

AGGREGATION AND COMMUNITY DEVELOPMENT OF PREHISPANIC PUEBLOS

Aggregation, or the concentration of formerly dispersed populations into larger towns and villages, occurs for a variety of reasons. Many archaeologists have cited that people aggregate into larger settlements for protection from warfare and raiding (LeBlanc 1999, 2001), including the pueblos on Perry Mesa (Wilcox et al. 2001a, 2001b; Wilcox and Holmlund 2007). Others have attributed population concentration to migration (Bernardini 2005; Duff 1998; Lyons 2003; C. Stone 2000), increasing competition for resources (Adler 1996; Cordell 1996; Kintigh 1994), the maintenance of social networks in times of resource stress (Plog 1983; Plog et al. 1988), increasing population and the resulting need for organizational change (Crown and Kohler 1994; Kintigh et al. 2004; McGuire and Saitta 1996; Rautman 2000), and the protection of agricultural land tenure (Adler 1996).

Studying the initial reasons for aggregation and its relationship to community development in a specific region, like Perry Mesa, needs to extend beyond the aggregated settlement itself. In their discussion of aggregation in archaeological contexts, Kolb and Snead

(1997) stress the need to consider the *entire* community, including agricultural field areas and their associated features, not just the aggregated settlement itself. Kolb and Snead explain that the community is not limited to the aggregated settlement, but the entire catchment that the aggregated settlement used. They argue that “By combining a focus on the lower ‘community’ levels of the settlement hierarchy with intensive survey coverage and understanding of the operational scale of the social unit under study, this approach provides a means through which community-level activity patterns can be examined” (Kolb and Snead 1997:612). Thus, by focusing on the outlying room blocks in addition to the larger pueblos on Perry Mesa, we can gain a more complete view into the entire scale of the community initially occupying the area.

Wilcox and Holmlund (2007) also briefly mention the importance of studying the outlying, small room blocks around Pueblo la Plata and other large pueblos in understanding the settlement history of Perry Mesa. Using surface diagnostic sherds around these room blocks, Wilcox and Holmlund hypothesize that many of these structures were occupied contemporaneously with the pueblos. If these outlying room blocks were constructed and occupied at the same time as the pueblos, they argue, then the simultaneous construction of the pueblos and the outlying room blocks were a “deliberate, coordinated, planned act” and that these settlement complexes were “‘hardened positions from the beginning [of settlement]” (Wilcox and Holmlund 2007:82). Others hypothesize that some of these room blocks could have been precursors to the construction of the large pueblos, possibly indicating a slower migration to Perry Mesa (Kruse-Peebles and Strawhacker 2012; Wilcox et al. 2001b). Unfortunately, due to the absence of many diagnostic sherds on the surface (and overlapping dates of the production of those ceramics) and the unavailability of absolute dates, the temporal relationship between the outlying room blocks and the large pueblos remains unclear and needs to be evaluated with more archaeological data.

While many previous analyses of aggregation understandably focus on the aggregated settlement itself, this analysis focuses on the outlying room blocks in order

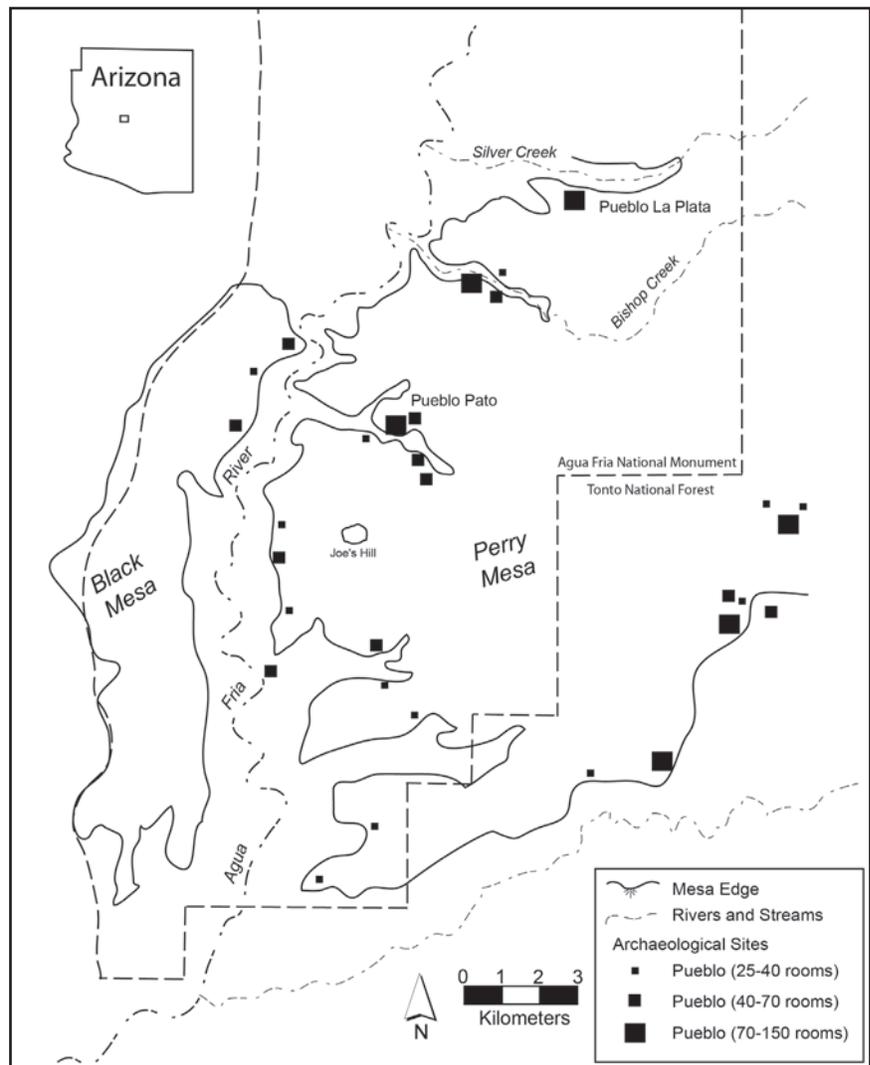


Figure 1. Large Pueblos of Perry Mesa, Displaying the Locations of Pueblo la Plata and Pueblo Pato (Map made by Melissa Kruse-Peebles)

to understand how the entire settlement system grew into the initial pulse of occupation in the late AD 1200s. Perry Mesa is also unique from other areas in the American Southwest in that these outlying room blocks are located close to the pueblos – often a 10-minute walk from the large settlement – making for an interesting relationship between these small structures and their nearby pueblos. While the data presented here are modest, this analysis provides interesting conclusions regarding the processes of aggregation and community development on Perry Mesa.

WHAT ARE OUTLYING, SMALL ROOM BLOCKS?

Typically referred to as *field houses*, *farmsteads*, or *hamlets* in the literature, small room blocks (1-10 rooms) across the U.S. Southwest have been hypothesized to have a number of different functions. Due to their characteristically far distance from the pueblo

and their proximity to agricultural fields, archaeologists argue that these sites were used for tending agricultural fields on a seasonal basis. These field houses usually represent a response to a growing population in which agriculture must be intensified closer to the pueblo while simultaneously extended to previously uncultivated areas far from the pueblo (Preucel 1988; Wilcox 1978). Thus, these field houses are constructed to house agriculturalists tending fields while away from the village.

More recently, small room blocks have been argued to serve as boundary markers in an increasingly crowded landscape in which communities are beginning to perceive future land shortages (Courtright, this issue; Kohler 1992; Stone and Downum 1999). Like the use of field houses, this land tenure hypothesis is a result of intensifying agriculture and, in addition to housing people working in distant agricultural fields, these field houses serve to mark territory. Furthermore, these rooms could have held stored agricultural crops or tools, as the agriculturalists traveled daily from the pueblo to the fields.

The function of the outlying room blocks on Perry Mesa is unknown, and few have been excavated (see Figure 4 for an example studied in this analysis). Their construction style (primarily basalt masonry) and few remaining diagnostic surface ceramics indicate they were constructed and inhabited during the Perry Mesa Tradition, like Pueblo la Plata and Pueblo Pato, although their contemporaneity with the pueblos is unknown (Kruse-Peeples et al. 2009; Wilcox and Holmlund 2007). Nine small room blocks (ranging from 1-4 rooms each) have been excavated on Perry Mesa, most to the south and east of Pueblo Pato. These small room blocks display a range in variability in architecture, artifacts, and presence or absence of hearths and burials. Some have been interpreted as permanent residences, while others have been classified as more ephemeral constructions (Fiero 1980; Gumerman et al. 1975; Spoerl and Gumerman 1984). The small room blocks of focus in this paper are unique from previously described small room blocks across other parts of the Southwest, due to their proximity to the pueblos on Perry Mesa (most are locat-

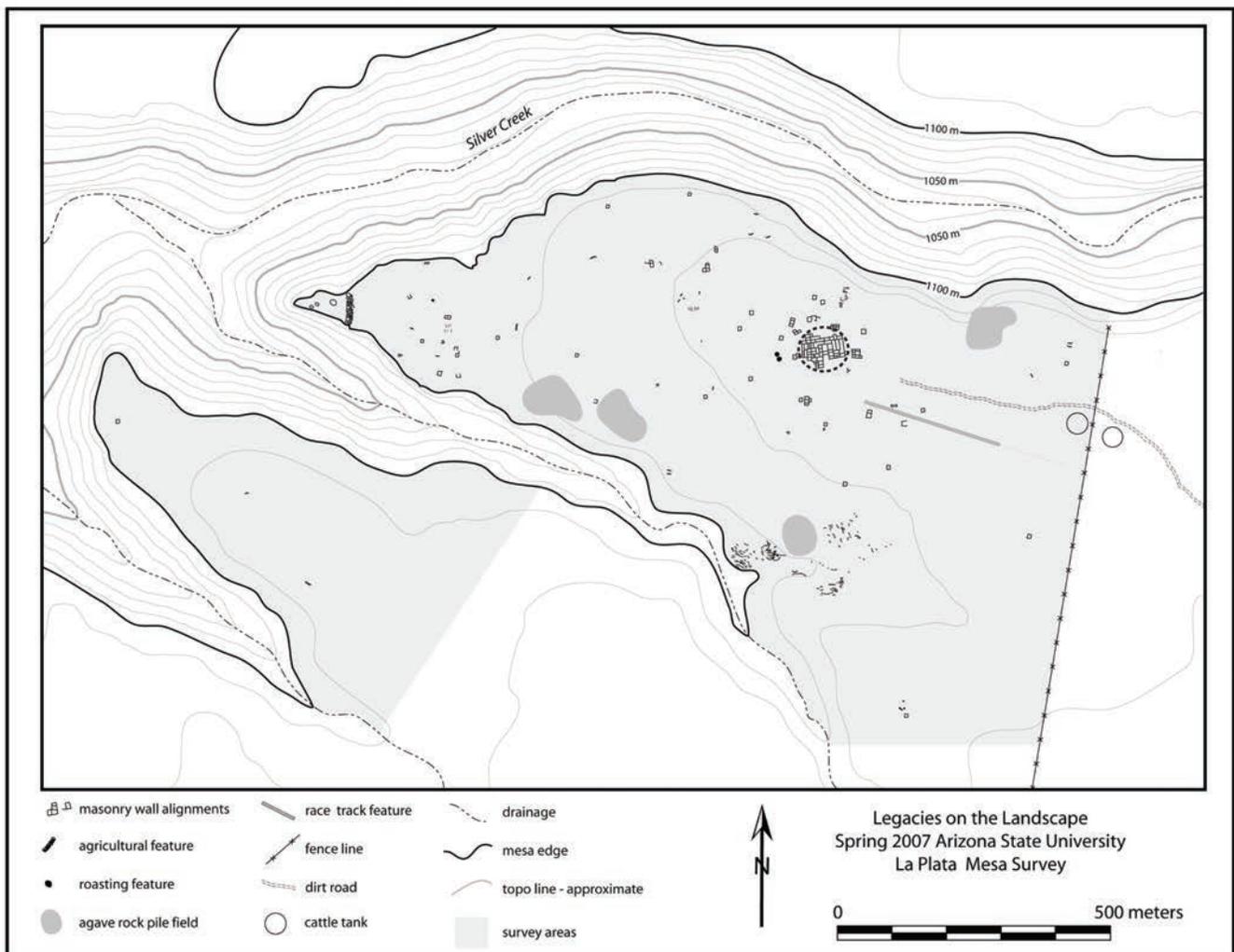


Figure 2. Pueblo la Plata and Surrounding Room Blocks. (Dashed circle around pueblo indicates rooms not included in the analysis; map by Matthew Peeples)

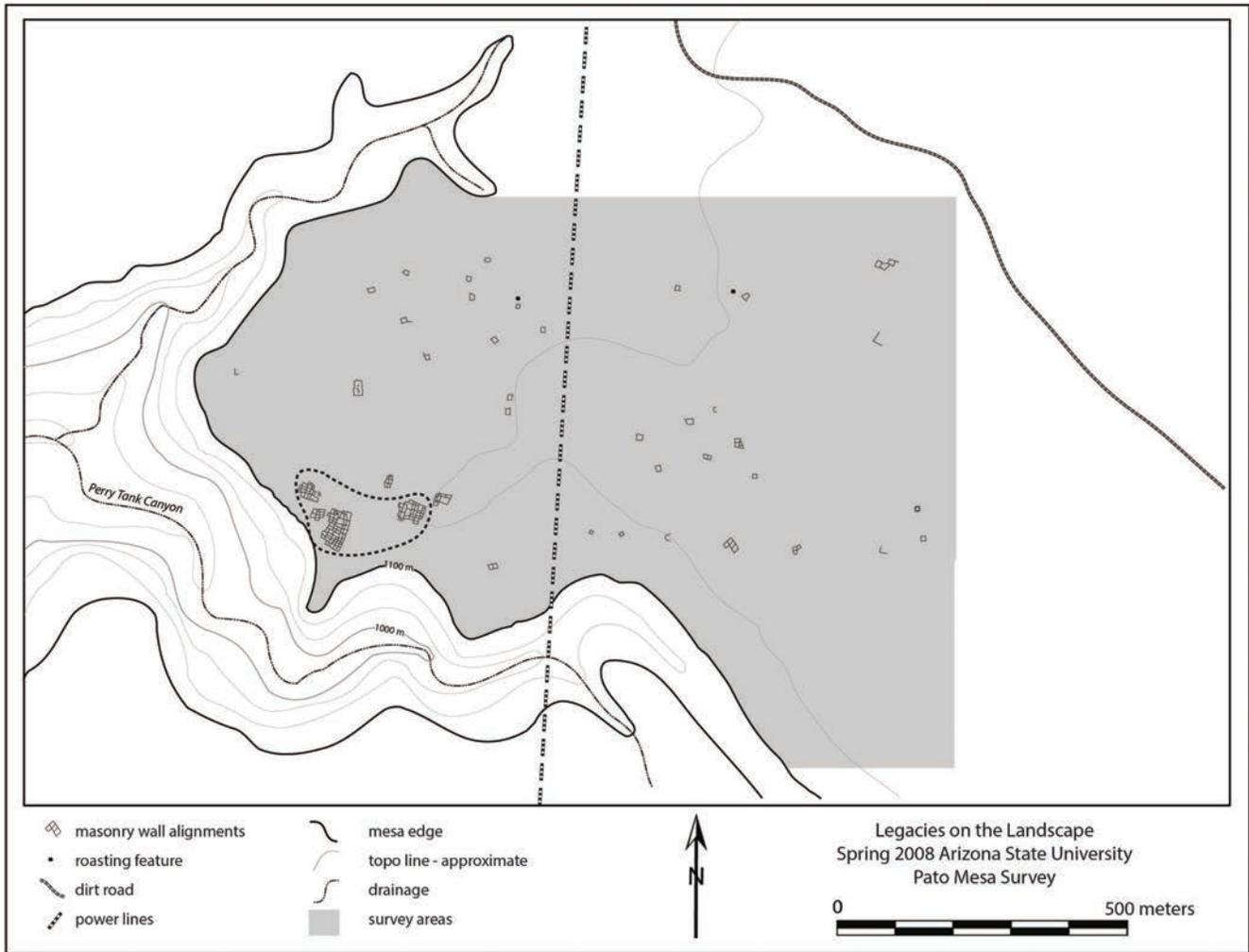


Figure 3. Pueblo Pato and Surrounding Room Blocks. (Dashed circle around pueblo indicates rooms not included in the analysis; map by Colleen Strawhacker.)

ed within 1 km of the pueblo). While they may have been used for storage, seasonal (or even daily) residences for farmers, or land claims for the surrounding agricultural fields (which were also located during the archaeological surveys), it is important to understand their relationship to the pueblos (Kruse-Peeples et al. 2009; Kruse-Peeples and Strawhacker 2012).

Architectural data from room blocks of many sizes across the Southwest have been helpful in discerning the prehispanic function of the room blocks, the investment into their construction, cultural affiliation of the people using the room block, and social inequality in the region (Gilman 1987; McGuire and Schiffer 1983; Wilshusen 1989). Primarily focusing on the pithouse to pueblo transition across the northern Southwest, archaeologists have argued that architectural data can be used to interpret both the

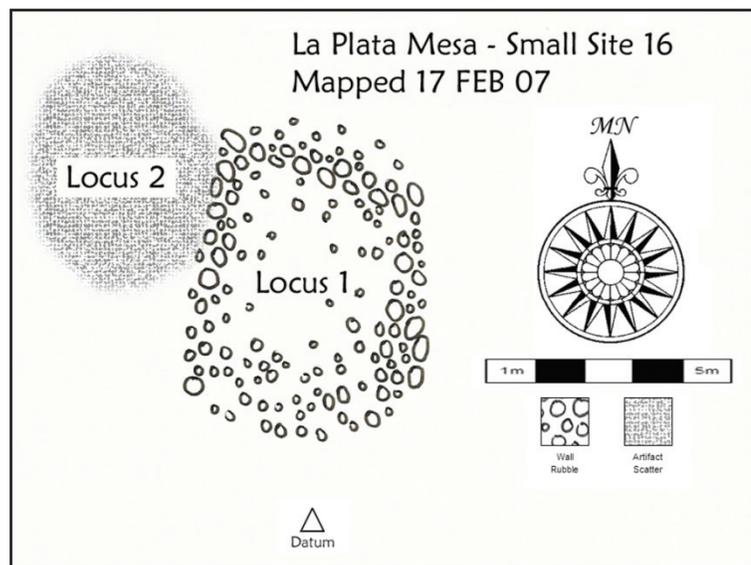


Figure 4. Example of a Room Block on Perry Mesa. (Map by Will Russell, Kruse-Peeples et al. 2009)

utilitarian and symbolic activities that may control the architectural variability of these structures. Architectural variability in these small room blocks may be a result of symbolic signaling of status or kinship, residential mobility, availability of construction material, and minimizing the cost of construction or maintenance (McGuire and Schiffer 1983). Preliminary investigations into the architecture of the pueblos on Perry Mesa show that the inhabitants of these structures preferred the closest available stone for their construction material. Around Pueblo la Plata, for instance, an area depleted of stone directly adjacent to the pueblo shows that its builders prioritized least effort to procure construction material (Briggs et al. 2006).

Discerning the function and timing of the construction of these outlying room blocks is useful in understanding the occupational history and community development of the pueblos on Perry Mesa. This analysis cannot discern the exact function of the room blocks, but can provide data on whether the functions greatly varied between the two communities (Pueblo la Plata and Pueblo Pato) and clarify their temporal relationship to the pueblos. If the outlying room blocks were constructed before the pueblos and served as primary residences, this construction sequence could indicate that a slow buildup of construction occurred on Perry Mesa, with initial occupation in the outlying, small room blocks and eventually aggregating into large pueblos. If they were constructed at the same time as the pueblos, this could indicate that rapid construction occurred on Perry Mesa, potentially supporting the “castle defense” theory of occupation on the mesa (Wilcox et al. 2001b; Wilcox and Holmlund 2007).

METHODOLOGY

During the spring of 2007, the Arizona State University Legacies on the Landscape seminar performed systematic surveys at both Pueblo la Plata and Pueblo Pato to locate room blocks and agricultural features associated with these pueblos (Figures 2 and 3). This interdisciplinary research was designed to understand the construction histories of multiple pueblos, the distribution of architecture across the landscape, the location and extent of agricultural fields, and the long-term ecological impacts of these agricultural fields (Briggs et al. 2006; Kruse Peoples et al. 2009; Spielmann 2011; Spielmann et al. 2011).

Both surveys were designed to cover the same acreage for comparability (approximately 220 ac per site) and were performed with four to five people, walking 15 m apart. When a cultural feature was located, a GPS point and initial observations were recorded. The project’s first priority was to map all of the outlying room blocks around Pueblo la Plata, resulting in 37 room blocks included in this analysis (of 49 cultural features, which also include roasting pits and historic structures).

At Pueblo Pato, 30 room blocks were identified in the same square acreage around the pueblo. Only structures more than 10 m away from the pueblo and with fewer than 11 rooms were included in this analysis to ensure that architectural units directly associated with the main pueblo room blocks were not included. Figures 2 and 3 show the small structures found on the surveys at both pueblos. Note that the room blocks have not been drawn to scale, in order to see their shapes, and that agricultural features have not been as extensively mapped on Pueblo Pato. Thus, their absence on the map is not due to their absence in reality.

These sites were then revisited throughout the course of the field season and mapped using the compass and tape method. A number of observations on the nature of the construction and surrounding environment were recorded. The number of rooms was estimated from observed external and cross walls of the room block, while the area of the room block was calculated from the map of the room block produced during the survey. One- and two-room structures may have functioned in the ways described above (as storage areas, field houses, or boundary markers). Three-walled structures, common on Perry Mesa, were recorded as having one room. Detailed maps and descriptions of the small room blocks are included with the survey report submitted to the Bureau of Land Management (Kruse-Peoples et al. 2009).

The number of rooms and the area of a room block, both of which are related to each other, provide complementary lines of evidence on how the functions of the room blocks varied between both communities at Pueblo la Plata and Pueblo Pato. As these room blocks become larger than two rooms, they may have served a more permanent purpose, as a seasonal residence or meeting area (Kohler 1992; Preucel 1988; Wilcox 1978). If major differences emerge in how large the small room blocks around both pueblos were, the prehispanic function of these room blocks may differ. For example, if the outlying room blocks around Pueblo Pato are larger than those around Pueblo la Plata, the outlying room blocks around Pueblo Pato may have been used as permanent residences, unlike those at Pueblo la Plata.

Two other variables - stone shaping and mound height - provide further evidence of function and initial investment into the construction of the small room block. Mound height can indicate investment into the quality of construction (i.e., height of walls prehispanically, which could then indicate planning or time investment), post-occupational processes, such as stone robbing, or natural processes like runoff or erosion, which can lead to lower mound heights. Lower mound heights may also reflect *jacal* structures, which use stone for their base, with a brush superstructure, thus resulting in less surface stone observed today. The structures used in this analysis, however, were recorded as structures with full height masonry walls, indicating that other

factors, like stone robbing, may be driving the mound height of these room blocks, not the original prehispanic construction style.

Stone shaping requires an investment in time and labor in order to build more stable walls, although some have suggested that shaped stone may reflect cultural affiliation (Clark 2001; McGuire and Schiffer 1983). Shaping of construction material indicates additional labor investment and planning for extended occupation, and is commonly used in the large pueblos on Perry Mesa (Mapes 2005). Many of the outlying room blocks, however, depending on their prehispanic function, could have been quickly constructed without shaped basalt, which is widely available on the mesa surface. The degree of stone shaping was observed while mapping the structures. Categories include no stone shaping, about half the construction stones are shaped, and most construction stones are shaped. While this variable is closely related to mound height (i.e., if stones were shaped, the mound height is more likely to be higher today), it provides important information on the deliberate planning and time invested into the initial construction of these outlying room blocks.

Finally, two variables - mound height and number of rooms - are revisited and compared to their distance from the pueblo in order to understand how the small room blocks relate to the pueblo, temporally. Due to the lack of excavation data from Pueblo la Plata and Pueblo Pato on Perry Mesa, the contemporaneity of these pueblos and their surrounding room blocks cannot, at present, be determined with absolute dating techniques. Because of this limitation, it has been assumed that small room blocks and the pueblos were occupied at the same time, due to similar architecture styles and limited amounts of diagnostic ceramics, like Jeddito Yellow Ware and White Mountain Redware, on the surface (Fish et al. 1975; Kruse-Peeples et al. 2009; Stone 2000; Wilcox and Holmlund 2007). While the analysis of wall construction patterns at Pueblo la Plata and Richinbar Pueblo has shown that the pueblos grew accretionally over the course of multiple construction periods (although it is unknown how long these construction periods would have lasted), it is unknown whether the small room blocks were constructed before, during, or after the construction of the pueblo (Mapes 2005; Hoogendyk 2011; Schollmeyer 2004, 2005; Wilcox and Holmlund 2007). If the temporal relationship between the small room blocks and the pueblos can be determined, this analysis can provide another line of evidence of how population was concentrating on Perry Mesa during the late AD 1200s.

To understand the temporal relationship of the outlying small room blocks and the pueblos, I use the relationship between the number of rooms and mound height, as compared to distance from the pueblo, to document prehispanic stone robbing of the outlying small room blocks. Previous analyses have shown that

a radius of groundcover directly adjacent to Pueblo la Plata had been depleted of stone, presumably to construct the pueblo, resulting in a distinct change in vegetation (Briggs et. al 2006:184), showing that, not surprisingly, the architects of Pueblo la Plata preferred nearby stone. As soon as the area directly adjacent to the pueblo would have been depleted of stone, the residents of the pueblo may have resorted to robbing stone from the closest, previously-constructed, unoccupied structures. Thus, if stone robbing took place prehispanically, mound heights of the outlying structures closer to the pueblo would be lower than those farther away from the pueblo; mound height of the small room blocks would gradually increase with distance from the pueblo. If stone robbing did occur, the outlying room blocks nearest the pueblo would have been occupied and abandoned before the construction of the pueblo, thus establishing a temporal sequence of occupation.

To further understand the construction history of the pueblos and the outlying room blocks, the number of rooms of the outlying room blocks is plotted against the distance away from the pueblo. As explained above, larger room blocks may have been used for more permanent reasons, such as year-round residences, and their relationship to the pueblo can be helpful in discerning the developmental processes of each pueblo. This analysis, in combination with evidence for stone robbing, will help clarify the development of the pueblos in relationship to the outlying room blocks.

RESULTS

Function of the Outlying Room Blocks

Analyses of the number of rooms and the room block area of the outlying room blocks show no clear differences overall between the communities around both pueblos. Figures 5 and 6 show that the distribution of the number of rooms and the area of the outlying room blocks is similar overall at both pueblos. Two-sample t-tests were performed, and support that no significant differences exist in the number of rooms and the room block area between the overall room block communities around Pueblo la Plata and Pueblo Pato ($p = 0.418$, CI = 95 percent [number of rooms]; $p = 0.145$, CI = 95 percent [area of the room block]) (Table 1). Because the size of the small room blocks around both pueblos is similar, these small room blocks were most likely used for similar functions prehispanically.

Investment in Room Block Construction

Differences between the outlying room blocks of both pueblos emerge when the degree of stone shaping and the mound heights of the outlying room blocks are compared to assess the level of investment into the construction of the small room blocks. Figure 7 shows slight differences in mound height of the outlying room blocks - all recorded as having full height masonry walls, pre-

hispanically – between the two communities. On average, the mound heights of the room blocks of Pueblo la Plata are lower than those around Pueblo Pato. This difference could be due to more planning and labor investment in the sites around Pueblo Pato, or to variability in post-occupational processes between both pueblos. While a two-sample t-test shows that these differences are not statistically different overall ($p = 0.176$, CI = 95 percent), the average mound height at Pueblo Pato (33.80 cm) is almost twice as high as that at Pueblo la Plata (18.97 cm) (Table 1).

Figure 8 shows the degree of stone shaping observed in the small structures of each pueblo. Perhaps the most convincing example of variability in time and labor investment, 43 percent of the outlying room blocks at Pueblo Pato were at least partially constructed with shaped stone, compared to none at Pueblo la Plata. A two-sample t-test was performed on the categorical data from outlying room blocks around both pueblos, resulting in a statistically significant difference between the groups of room blocks around the pueblos ($p < 0.01$, CI = 95 percent).

While clear differences exist between the communities in degree of stone shaping, the interpretive significance of the mound height variability remains unclear, perhaps due to differences in post-abandonment stone robbing between the sites. While no statistically significant differences in mound height can be observed (although mound heights on average are higher at Pueblo Pato), the structures around Pueblo Pato were constructed with more shaped stone than those around Pueblo la Plata, indicating differences in construction patterns among the two sites. The presence of shaped stone in the room blocks around Pueblo Pato indicates that more effort was invested in their construction, compared to those around Pueblo la Plata.

Contemporaneity of Outlying Room Blocks and the Larger Pueblos that They Surround

Clear differences emerge again between Pueblo la Plata and Pueblo Pato when comparing mound height and number of rooms at the outlying room blocks to the distances from both pueblos. Figure 9 shows two divergent patterns of these communities when the mound heights of the outlying room blocks are compared against their distance from the large pueblo. While mound height decreases with distance from the pueblo at La Plata, the opposite holds true at Pueblo Pato. The mound heights at Pueblo la Plata are highest in those structures closest to the pueblos (cubic $r^2 = 0.390$), indicating that stone robbing likely did not occur here. The mound heights at Pueblo la Plata indicate that the structures around that village may have been constructed and inhabited contemporaneously with the pueblo or after the pueblo’s abandonment. The mound heights of the outlying room blocks at Pueblo Pato, on the other hand, are higher with increasing distance from the

Table 1. Differences in Architectural Attributes at the Small Room Blocks around Pueblo la Plata and Pueblo Pato

		Pueblo la Plata	Pueblo Pato
Number of Rooms	N	37	30
	Mean	1.51	2.10
	SD	1.017	1.900
Area of the Room Block (m ²)	N	37	30
	Mean	23.77 m ²	50.05 m ²
	SD	17.12 m ²	91.59 m ²
Mound Height (cm)	N	37	30
	Mean	18.97 cm	33.80 cm
	SD	19.06 cm	23.39 cm

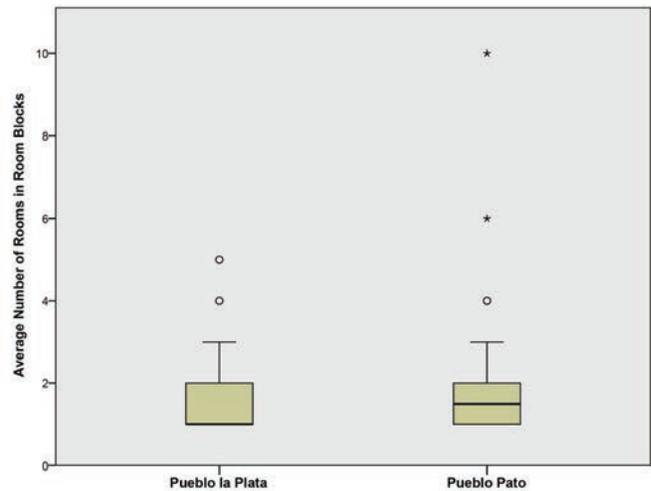


Figure 5. Average Number of Rooms per Room Block at Pueblo la Plata (n = 37) and Pueblo Pato (n = 30)

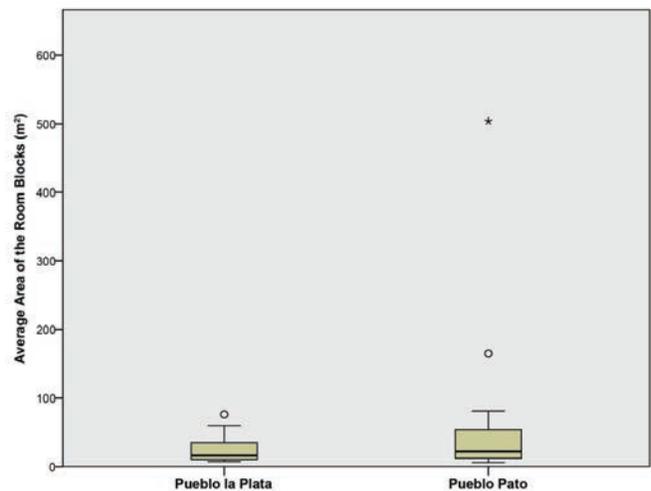


Figure 6. Average Area of Room Blocks (m²) around Pueblo la Plata (n = 37) and Pueblo Pato (n = 30)

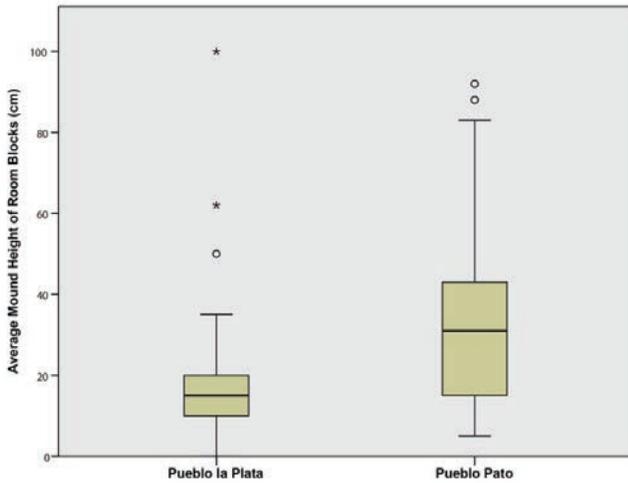


Figure 7. Average Mound Height of Room Blocks (cm) around Pueblo la Plata (n = 37) and Pueblo Pato (n = 30)

pueblo, indicating the possibility that those structures closest to the pueblo may have been robbed for their construction stone prehispanically (cubic $r^2 = 0.121$). These data support evidence that the small room blocks around Pueblo Pato were occupied and abandoned before the construction of the pueblo, while those around Pueblo la Plata were occupied contemporaneously or after la Plata's abandonment.

While the first analysis on the number of rooms did not show any overall differences in function between these two communities, plotting the number of rooms

of each room block against distance from the pueblo might clarify the relationship between the outlying room blocks and the pueblos.

Figure 10 shows, again, two different patterns at Pueblo la Plata and Pueblo Pato. While most of the larger outlying room blocks are located closer to Pueblo la Plata ($r^2 = -0.059$), many of the larger room blocks are located farther away from Pueblo Pato ($r^2 = 0.107$; the outlier of the 10-room room block was removed from the analysis). Although the r^2 values for both regressions are low – indicating that the relationship between number of rooms and distance from the pueblo is not strong – the regression lines and distribution of points show two distinct patterns around both pueblos. The larger room blocks tend to be closer to Pueblo la Plata, while larger room blocks are located farther from Pueblo Pato, indicating differences in the occupational histories around both pueblos.

DISCUSSION

The analyses presented here provide interesting interpretations about the occupational histories of two pueblos on Perry Mesa during the late AD 1200s and early AD 1300s. First, the average number of rooms and area of the room blocks suggest that the overall function(s) of the outlying room blocks around both pueblos were similar. Without further analysis (excavation, artifact collection, etc.), specific prehispanic function cannot be determined for individual room blocks, besides what can be interpreted with these results from

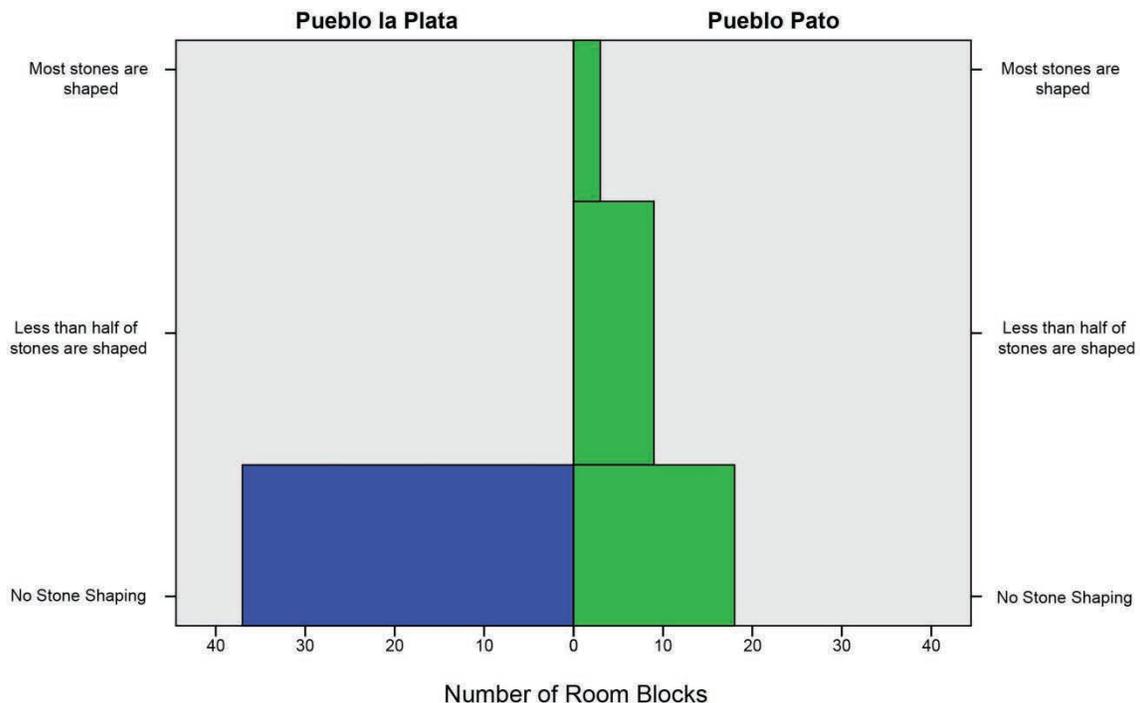


Figure 8. Stone Shaping Observed in the Room Blocks around Pueblo la Plata (n = 37) and Pueblo Pato (n = 30)

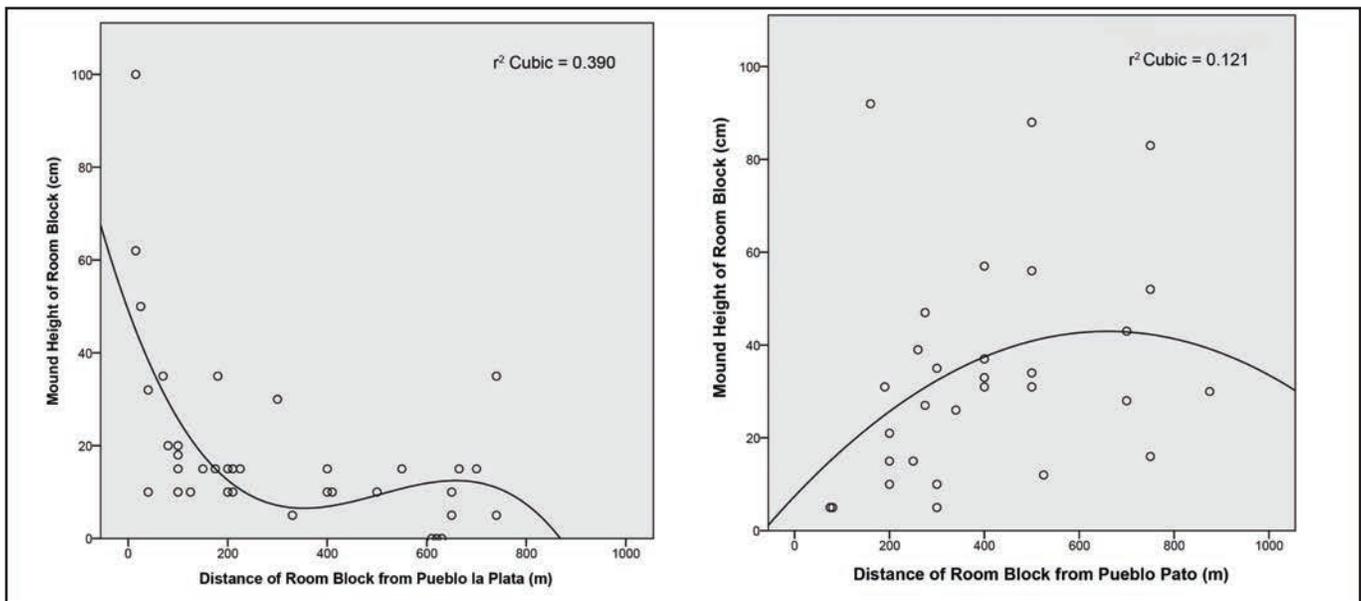


Figure 9. Mound Height (cm) and Distance (m) from Pueblo la Plata (left; $n = 37$, cubic $r^2 = 0.390$) and Pueblo Pato (right; $n = 31$, r^2 Cubic = 0.121)

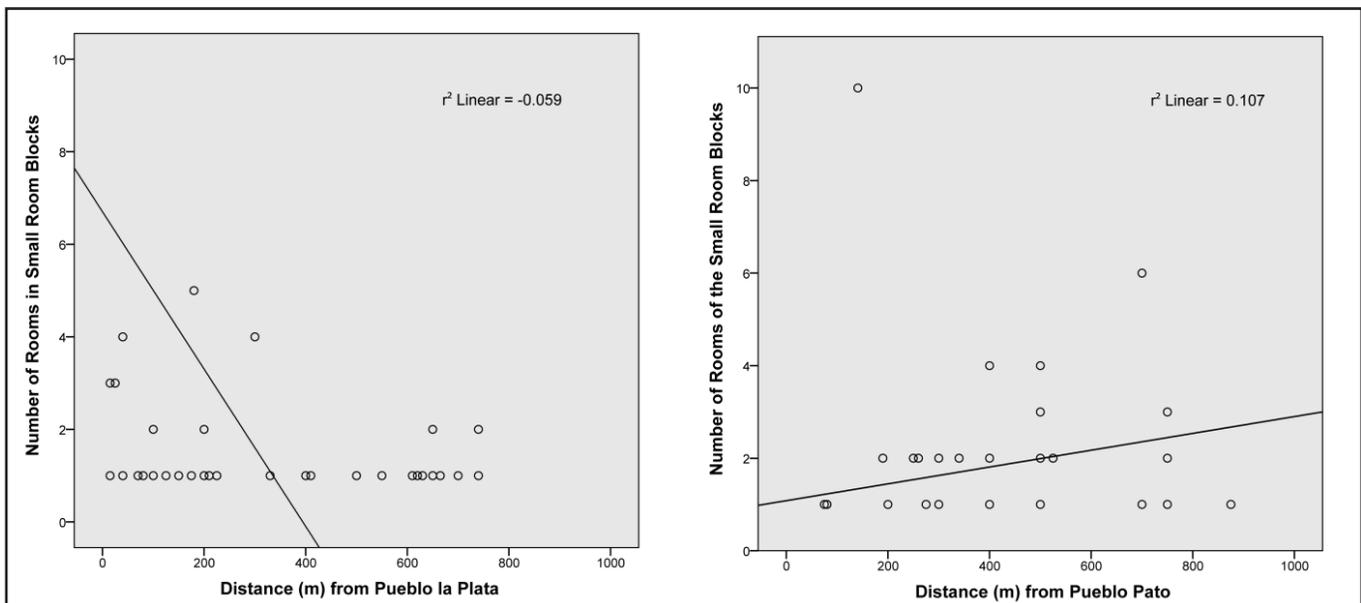


Figure 10. Number of Rooms and Distance (m) from Pueblo la Plata (left; $n = 37$, $r^2 = -0.059$) and Pueblo Pato (right; $n=31$, $r^2 = 0.107$)

architectural data observed on the surface: that *overall* function of both populations of outlying room blocks appears the same.

Mound heights and evidence for stone shaping, on the other hand, represent significant time and labor investment into construction, and considerable differences exist between the room blocks around both pueblos. The outlying room blocks around Pueblo Pato have more evidence for stone shaping than those around Pueblo la Plata, indicating that more time and labor was invested in their construction at Pueblo Pato. Consequently, while room function may be similar across

the landscapes, the time, planning, and labor investment was greater at Pueblo Pato than at Pueblo la Plata, perhaps indicating differences in how these structures were constructed and used prehispanically.

The relationship between mound height and number of rooms, as compared to distance from pueblo clarifies the occupational history of both pueblos. At Pueblo Pato, the mound heights of the outlying room blocks suggest that the closest room blocks were stone robbed (and thus occupied and abandoned before the construction of the pueblo), and the largest room blocks are located farthest from the pueblo. These data indi-

cate that the outlying room blocks were constructed before Pueblo Pato, used for more permanent residences (due to their larger size and evidence of stone shaping at many of these room blocks), and then abandoned as people aggregated into the larger pueblo, on the mesa edge. The inhabitants of Pueblo Pato then robbed these small room blocks for construction stone for the pueblo.

At Pueblo la Plata, however, no evidence exists for stone robbing, and, unlike Pueblo Pato, the largest room blocks are located nearest to the pueblo. These larger room blocks, close to the pueblo, may have been constructed at the same time as the pueblo, perhaps originally constructed to be added on to the pueblo in the future, especially with previously-documented evidence of the accretional growth of the pueblos (Mapes 2005; Hoogendyk 2011; Schollmeyer 2004, 2005; Schollmeyer and Nelson 2013). Indeed, only two small room blocks mapped during the 2007 survey at Pueblo la Plata were built with shaped stone, like the pueblo, and these room blocks are located within 10 m of the pueblo, and thus not included in this analysis (Kruse-Peeples et al. 2009). Alternatively, the small room blocks around Pueblo la Plata may have been constructed after the abandonment of the pueblo, as the population dispersed and small, remnant communities continued to use small room blocks around the abandoned pueblo. This pattern is similar to what has been documented around Grasshopper Pueblo and Point of Pines (Graves et al. 1982; T. Stone 2000; Wasley 1952). The room blocks around Grasshopper and Point of Pines, however, have had the benefit of extensive excavation data, allowing for temporal relationships between outlying room blocks and the pueblo to be firmly established. While this analysis of surface architectural data clarifies the occupational histories of small room blocks and pueblos on Perry Mesa, their temporal relationships could be further clarified with the collection and analysis of excavated ceramic, tree-ring, and architectural data.

CONCLUSION

Current archaeological evidence shows that before approximately AD 1270, Perry Mesa was a sparsely-inhabited landscape. Then, in the late AD 1200s, people migrated to Perry Mesa, where dense concentrations of agricultural and architectural features convey that this landscape was primarily used for agriculture by the early AD 1300s (Kruse 2007; Kruse-Peeples et al. 2009; C. Stone 2000). Archaeologists have sought to explain how and why this pulse of occupation and aggregation occurred. Did it occur quickly, with the contemporaneous construction of the pueblos, or did people incrementally build the pueblos and other structures as more of the landscape became favorable for the use of agriculture? The answer to these questions can clarify the factors that are driving the influx of people to Perry Mesa. The pueblos would have been constructed quickly and con-

currently, as argued by Wilcox and others, if they were built for the protection of Perry Mesa against warring polities to the south (2001a, 2001b). They would have been built incrementally, on the other hand, if people were migrating to Perry Mesa for agricultural opportunities as the climate became more favorable for crop production (Ingram 2014; Kruse 2007).

Overall, the results of the data analyzed here document a dense agricultural and residential landscape around Pueblo la Plata and Pueblo Pato. It appears that a number of different occupational histories are possible for the pueblos of Perry Mesa, as documented here and in other analyses (Kruse-Peeples et al. 2009; Kruse-Peeples and Strawhacker 2012). While Pueblo la Plata seems to have been constructed before or at the same time as its surrounding room blocks, Pueblo Pato appears to have grown more slowly, with the construction and abandonment of the small room blocks preceding the pueblo's construction. With these data from the small room blocks and other analyses performed on the pueblo itself, one overarching explanation for how people concentrated on Perry Mesa during the late AD 1200s may not be sufficient.

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ANTECEDENTS II: A PROGRESS REPORT ON THE ORIGINS OF THE PERRY MESA SETTLEMENT AND CONFLICT MANAGEMENT SYSTEM

J. Scott Wood

ABSTRACT

As described over a decade ago by David Wilcox, Jerry Robertson, and myself, and expanded on from time to time by one or more of us, the Late Classic (“PIV”) occupation of Perry Mesa was a highly organized settlement system integrated by a complex, local and regional, economic and political structure based on agriculture, trade, and warfare. The relative importance of each of these elements during the fourteenth century is still being debated, but one question remains largely unanswered: what was going on up there prior to AD 1300? This paper will attempt to characterize the Preclassic and Early Classic settlement systems on and adjacent to the mesa.

The recent discovery of several new sites and field evaluations of some previously recorded ones may help us to paint a new picture of the history of human occupation on Perry Mesa, the “jewel in the crown” of the Agua Fria National Monument, and a special part of the Tonto National Forest. It also gives us an opportunity to reconsider several elements of the “Verde Confederacy” model developed by Dave Wilcox, Jerry Robertson, and myself some years ago (Wilcox et al. 2001a, 2001b) to describe the development of the striking and fascinating settlement pattern and cultural landscape created on Perry Mesa in the fourteenth century.

My goal here is to look at the occupational sequence of topside Perry Mesa. As most people have interpreted the Verde Confederacy model, it supposedly called for a sudden influx of people into a previously all but unoccupied landscape. The model was actually a climate and migration story, and always held that there was an antecedent population both on and off the mesa prior to its rapid growth in the years just prior to AD 1300; it just focused on what happened later. Unlike several recent representations of the model, there was never any suggestion that the Perry Mesa occupation was focused solely on war; its people were always assumed to

have been both farmers and fighters, like most agricultural people on this planet. However, my purpose here is not to debate the Landscape vs. Alliance models of Perry Mesa development, but to introduce some new information and see where that leads us.

There has been relatively little systematic survey of Perry Mesa, and no professional excavation in any of the major site complexes that characterize its Late Classic¹ settlement system. There are a lot of data from contract surveys (e.g. Fiero et al. 1980; Fish et al. 1975; Heuett and Long 1996; North 2002; Watkins, et al. 2012), from the pothunting study (Ahlstrom et al. 1992), from the ongoing work being conducted by Arizona State University (Abbott and Lack, this edition; Abbott and Spielmann 2013), and contained in site inventories of the Museum of Northern Arizona (MNA), Arizona State Museum (ASM), the Central Arizona Ecotone Project (CAEP) of Prescott College/Southern Illinois University (Gumerman et al. 1976), the Bureau of Land Management (BLM), and the Tonto National Forest, but they are incomplete and inconsistent. There are difficulties in the recognition of features, questionable maps, conflicting ceramic identifications (when there are any at all), and a general lack of comparable data sets from one investigator to another. Counting all these inventories, my own wandering around, and recent work by dedicated amateurs such as Mike Hoogendyk (personal communication, 2012), there are well over four hundred known sites on Perry Mesa, but less than half of them have sufficiently recorded documentation to assign them to a specific time period. Therefore, the descriptions and interpretations of sites that follow are taken from my own observations at virtually every site mentioned, except for those on top of Black Mesa. Other people may have recorded many of these sites, but no one else need be blamed for my interpretation of them.

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We'll use these data to build several maps (Figures 1-4), to show rough approximations of settlement distribution across the mesa at different time periods. Temporal assignments for these maps were made primarily by ceramic identification, and used a basic assemblage signature for each period.

The Late Classic period (AD 1300-1400) signature is pretty well known. It is dominated by Tonto Plain (Verde and Perry Mesa varieties), and by the high-luster, polished redware commonly called Perry Mesa Red, but which resembles the Salt Red of the Late Classic Hohokam in the Phoenix area (Wood 1987). The decorated pottery of the Late Classic lacks a lot of variety, both in types and places of origin, being limited primarily to the so-called Salado Polychromes (Gila, Tonto, Los Muertos, etc.), Hopi yellow wares (Awatovi Black-on-yellow and Jeddito Black-on-yellow, with an occasional piece of Sikyatki Polychrome), small amounts of White Mountain Redware (especially Fourmile Polychrome), and a few late whitewares such as Bidahochi Black-on-white. You can also occasionally find a few sherds of phyllite-tempered Wingfield Plain and/or Red on some of the late sites, but for all intents and purposes, the Wingfield potteries ceased to be a major component of any topside ceramic assemblage after about 1300, replaced by sand-tempered plainware and highly polished redware.

The Early Classic period (AD 1150-1300) signature is distinctly different. It consists primarily of Tonto Plain and Red (Verde and Perry Mesa varieties) and Wingfield Plain and Red. Dominance by either Tonto types or Wingfield types varies from site to site, and may reflect temporal variations within the period or other historic patterns. Decorated ceramics are dominated by Little Colorado White Ware, particularly Walnut Black-on-white. Lesser elements include Tsegi Black-on-orange (1150-1300), Sosi Black-on-white (980-1180), Tusayan Black-on-white (1150-1300), Flagstaff Black-on-white (1085-1275), Winslow Black-on-orange and Polychrome (1250-1300+), and even Pinedale Polychrome (1275-1350); all dates are from the Checklist (Wood 1987) and are subject to revision, but should still be fairly close. There may also be sherds of Casa Grande Red-on-buff (1150-1300), Verde Red-on-buff (1150-1300+), Prescott Black-on-plain (aka Black-on-gray; 980-1300), or Tusayan Corrugated (1000-1300). Although none of these types occur in great abundance, the variety and consistency of their association with Wingfield Plain and Red suggests that the Early Classic on Perry Mesa was not a time of isolation, and that folks living there were able to produce something in enough quantity to trade. Curiously, considering the amount of Gila Polychrome on Perry Mesa, there appears to be very little Pinto Polychrome (1280-1300), perhaps indicating that these folks were under some kind of economic hardship and were otherwise engaged during that period and didn't have the time or capital to engage in a lot of trade or the manufacture of fancy pottery until things had settled down.

The Preclassic period on Perry Mesa (ca. AD 750-1150) is very much under-represented in the literature. Common types are a mix of Tonto Plain (mostly Verde variety) and Wingfield Plain, with some Wingfield Red. As we shall see, dominance of one or the other appears to follow several geographic and temporal patterns. Other plainwares include both Salt and Gila varieties of Gila Plain, typically in small quantities. The decorated assemblage is typical of Preclassic Hohokam sites throughout the "northern periphery." Buffwares include Snaketown Red-on-buff (at one site only, so far), Gila Butte Red-on-buff, Santa Cruz Red-on-buff, and, of course, Sacaton Red-on-buff, by far the most commonly encountered. Northern imports are dominated by Tusayan White Wares, particularly Black Mesa Black-on-white (980-1150) and Kana'a Black-on-white (725-1070). Other recurring imports include Deadmans Black-on-red (775-1070), Deadmans Black-on-gray (900-1150), Floyd Black-on-gray (800-900), and Sacaton Red (1000-1150?). A number of Preclassic sites on Perry Mesa also have slate palettes, eroded clusters of cremated bone, and Glycimerus bracelet fragments. Again, this assemblage suggests a population that was neither isolated nor lacking in anything to trade.

The sites we will discuss were either found myself or identified from the CAEP, MNA, or Tonto National Forest site files as having the Preclassic signature just described; all have been verified in the field. So far, the list is pretty short: just over 20 sites. Their approximate locations are shown in Figures 1 and 2. These sites cluster along the southern and eastern edges of Perry Mesa. The only exceptions are a couple of MNA and CAEP sites at the head of Lousy Canyon, and the large MNA-recorded site on the divide between Lousy Canyon and Perry Tank Canyon. There are Preclassic sites at several locations along the Agua Fria and a yet-to-be-recorded site at the BLM Silver Creek toilet along Bloody Basin road, but we will concentrate only on the ones topside and in Brooklyn Basin, just off the mesa proper, in an upland setting near the headwaters of the north fork of Squaw Creek.

Part of this distribution of sites may simply reflect the distribution of survey coverage, but there has been enough block and transect survey coverage of the rest of both Perry Mesa and Black Mesa (Fiero et al. 1980; Fish et al. 1975; Gumerman et al. 1976; Heuett and Long 1996; North 2002) to suggest that there is at least some validity to this pattern.

The earliest of these Preclassic sites appear to be in the Brooklyn Basin and Rosalie Mine areas (Figure 1). AR-03-12-01-1760, off the mesa top in Brooklyn Basin, has the earliest pottery so far, namely Snaketown Red-on-buff, probably a fairly late example. Never a large site, little more than a hectare at best, it nonetheless has a full range of buffwares, through Sacaton Red-on-buff, and looks as though it was in use, perhaps periodically, over a long time. There is at least one slab-faced, oval

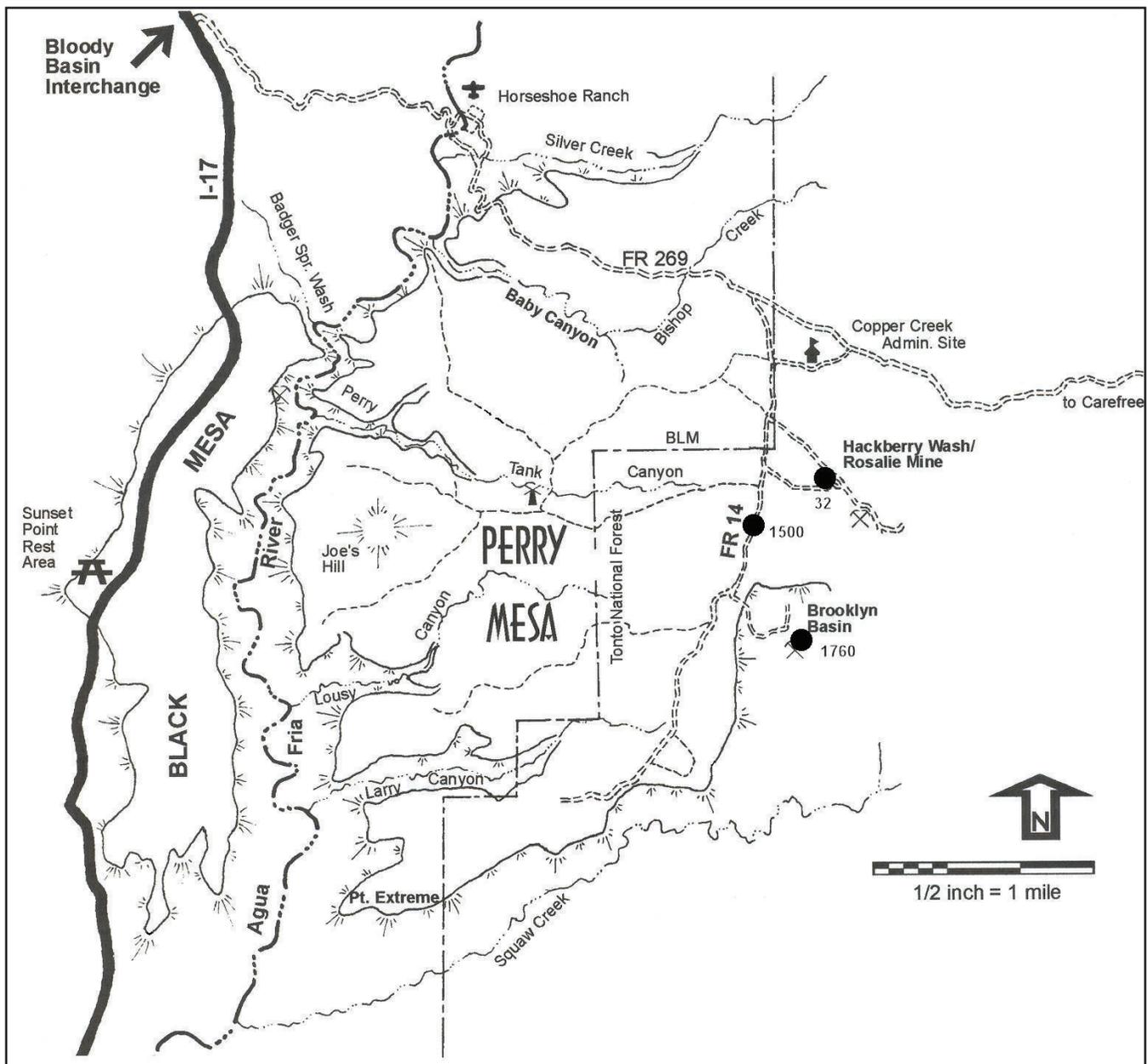


Figure 1. Early Preclassic Sites; Pre-Sacaton Phase

pithouse, exposed in a road. Through the kind graces and open checkbook of the Desert Foothills Chapter of the Arizona Archaeological Society, this site was included in a small ceramic study directed by Dave Abbott at ASU, and was sample surface collected last year (Snow and Abbott 2012). About a third of the plainwares were Wingfield. Although in a favorable, open location, not far from several former springs, it appears to have been abandoned at the end of the Sacaton phase.

The next-oldest of these Preclassic, Perry Mesa sites, going back into the Gila Butte phase (ca. AD 750) and continuing through the Sacaton phase (possibly as late as AD 1150), are AR-03-12-01-32 and AR-03-12-01-1500. The latter, known as the North Campbell site, is out on the mesa proper, at the interface between the formerly spring-laden foothills of Hutch Mesa and the

tobosa grass flats of Perry Mesa, in between Brooklyn Basin and the Rosalie Mine. Considerably larger, at about 3 ha or more, it contains Gila Butte-, Santa Cruz-, and Sacaton Red-on-buff, and appears to have been occupied for a considerable period, having several small-to moderately-sized trash mounds. Imported pottery includes Gila Plain (Gila variety), Deadmans Black-on-gray, Floyd Black-on-gray, Deadmans Black-on-red, Kana'a Black-on-white, Black Mesa Black-on-white, other Tusaayan White Ware, and Verde Red-on-buff. Although substantial and located in an area with water and better soils than the decomposed granites down in Brooklyn Basin, it too was abandoned at the end of the Sacaton phase. Like the Brooklyn site, there is Wingfield pottery all across the site, but the majority of the plainwares are sand-tempered varieties of Tonto Plain. There is a later

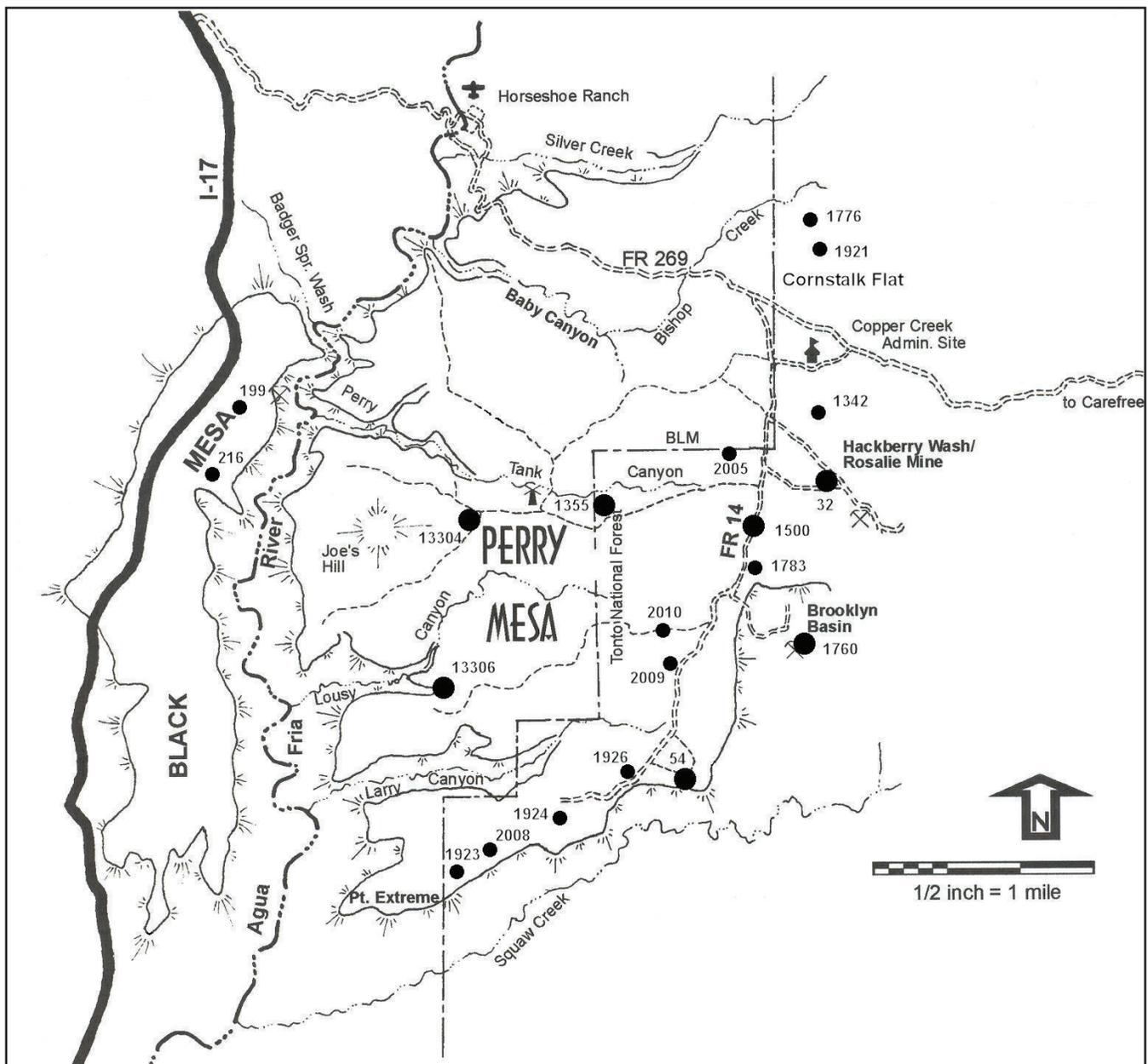


Figure 2. Sacaton Phase Preclassic Sites

component to the site, consisting of several Late Classic fieldhouses with polished redware, a slag roaster (possibly re-used from a Preclassic origin), and some agave terracing, but there doesn't appear to have been any continuity between the Sacaton phase and Late Classic occupations.

The third of our trio of early Preclassic sites is AR-03-12-01-32. The most notable difference between this site and the other two is that it was not abandoned at the end of the Sacaton phase. However, the later occupation partially obscures the earlier component. It is located in the middle of the Rosalie Valley, on the ridge opposite Big Rosalie Ruin (AR-03-12-01-1292), which was adjacent to a spring (which was turned into a stock tank in the 1960s, and has since dried up). It has a full range of buffwares, from Gila Butte to Sacaton, with Black Mesa

Black-on-white, Gila Plain (Gila variety), Tusayan Corrugated, and Prescott Black-on-plain. It is hard to judge intensity of occupation because there is no way, short of excavation, to tell how much of the Preclassic site is covered by the Classic period architecture and trash. Overall, with all of its components, it runs to about 2.5 ha, but only a few hundred square meters worth of the Preclassic component is accessible, about half of which is awash in later material. Once again, Wingfield Plain and Red are a consistent part of the assemblage, but it is dominated by Tonto Plain.

The number of Preclassic sites appears to have remained small and focused on the Brooklyn/Rosalie access points for several hundred years without any major expansion of territory. This situation appears to have changed during the Sacaton phase, when the number of

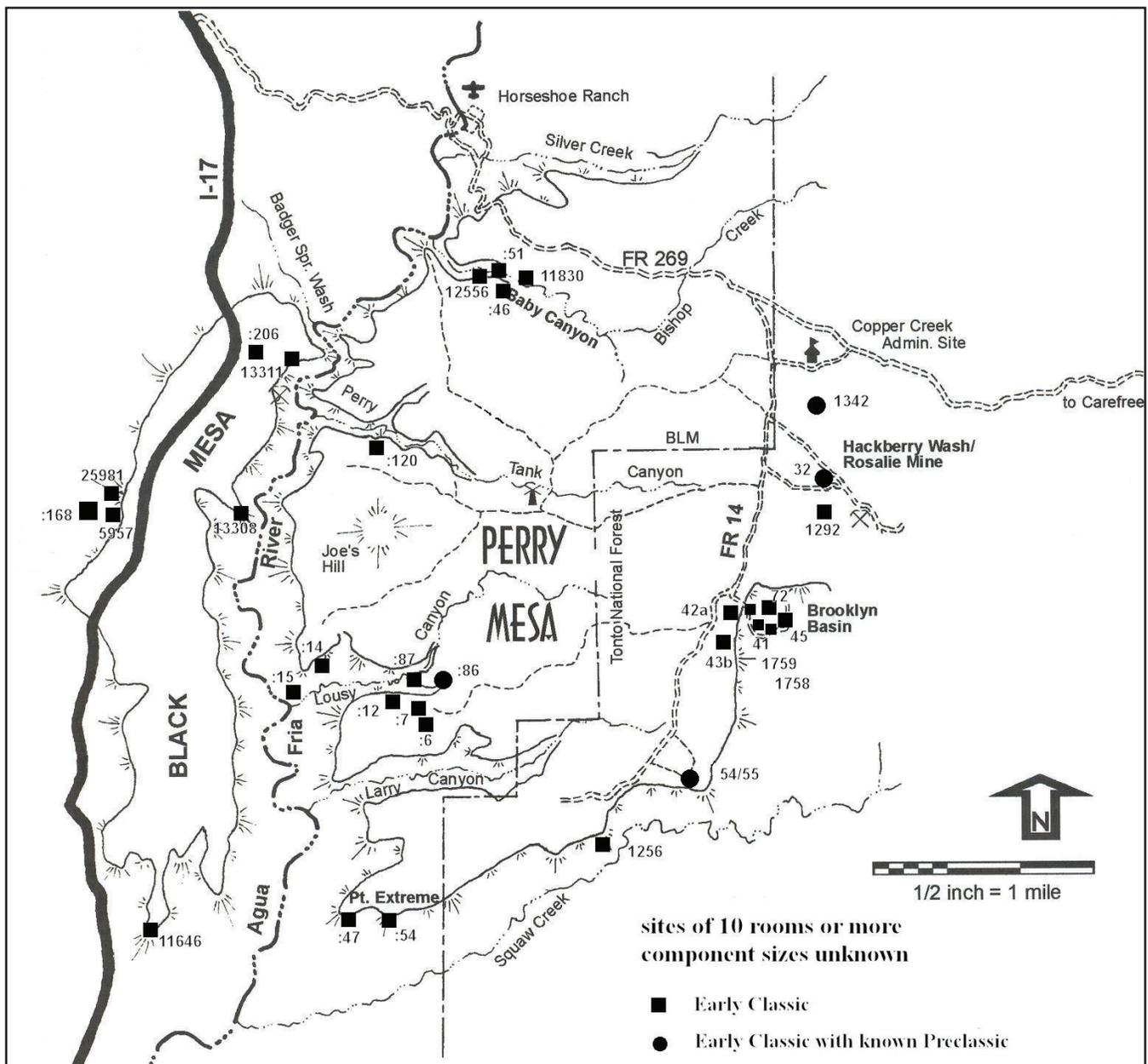


Figure 3. Early Classic Sites and Components

Preclassic sites on the mesa jumped dramatically, from three or four to 18 (Figure 2). Some of these new sites are on the eastern side of the mesa, clustered around the presumed original “founder” settlements, but there is an extension of this eastern zone both to the north, into the Cornstalk Flat area, and to the south, along the Squaw Creek edge of the mesa. There is also an expansion out into the interior of the mesa proper.

The first new site to the north of Rosalie is AR-03-12-01-1342. It is small, probably less than 1 ha, but has a fairly substantial, eroded trash mound with Tonto Plain (Verde variety), Wingfield Plain and Red, Sacaton Red-on-buff, and Black Mesa Black-on-white. The site also has an Early Classic component, and may have continued into the Late Classic. The Cornstalk Flat, Sacaton phase

pithouse settlements may have been an attempt to exploit another area of loamy, gravelly soils near the Hutch Mesa/Perry Mesa interface like those in Rosalie, though the Cornstalk Flat soils tend to be shallower than those farther south. The ceramic signatures of these sites are very similar to those from the Rosalie area in terms of the ratio of Tonto to Wingfield types. However, this expansion failed, since these sites were both abandoned by the end of the Sacaton phase and there is little or no subsequent occupation in that area.

The expansion out into the middle of the mesa might not have originated from the Brooklyn/Rosalie nexus, but rather may have been the result of a new incursion of Hohokam, coming up out of the Agua Fria via Lousy Canyon. One of these new sites, AR-03-12-

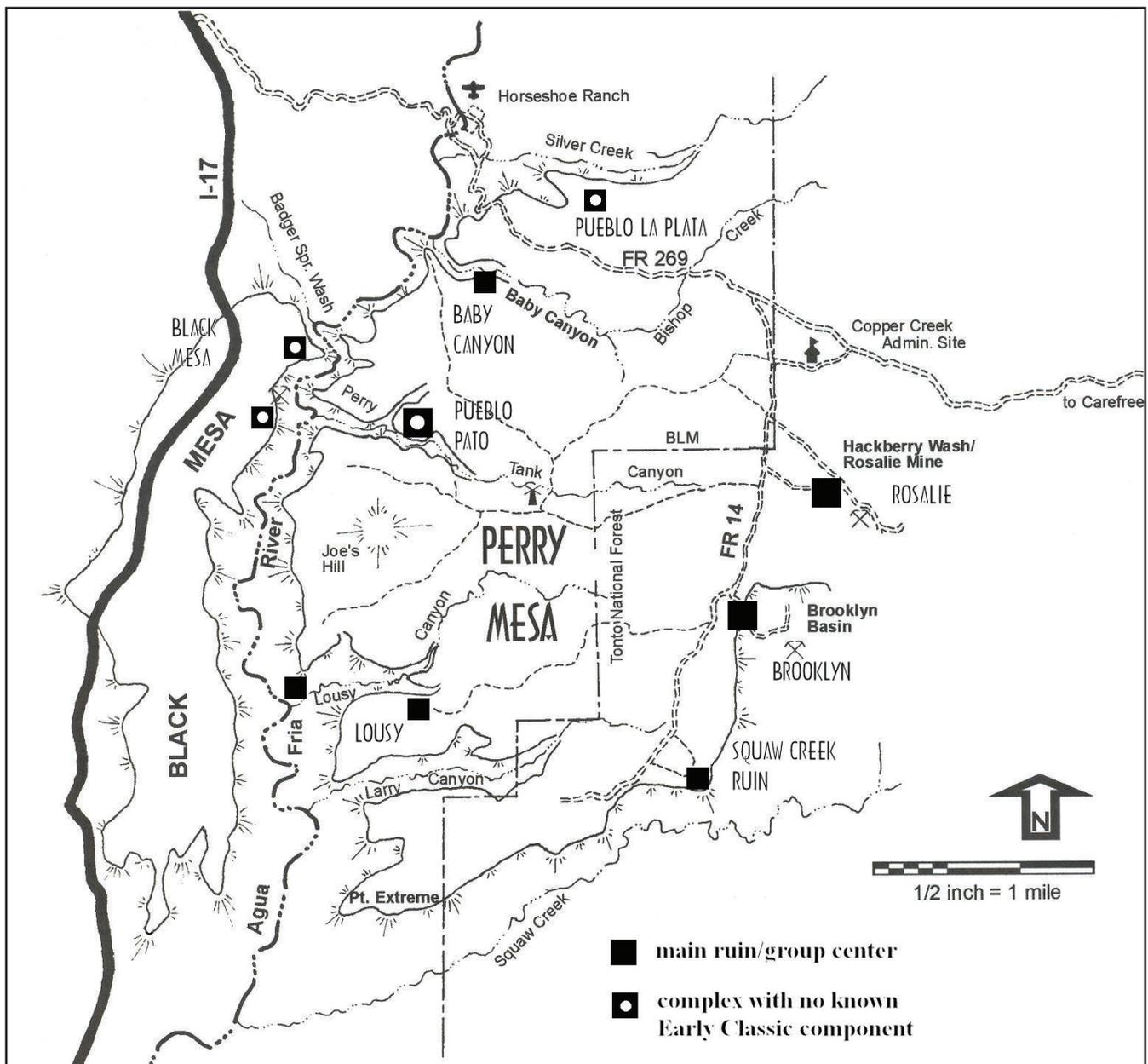


Figure 4. Late Classic Site Complexes

01-1355, is several miles west of the North Campbell site, out on the open mesa near Perry Tank. It was relatively small, with a core of about 1 ha. It had a single sherd of what could have been Santa Cruz Red-on-buff, but the bulk of the assemblage indicated that it was primarily occupied during the Sacaton phase: Sacaton Red-on-buff, Kana'a Black-on-white, Black Mesa Black-on-white, Deadmans Black-on-gray, Deadmans Black-on-red, and Sacaton Red, very similar to what can be seen at North Campbell. Also like the North Campbell site, this one was abandoned at the end of the Sacaton phase, with a few ceramic indications and agricultural features suggesting that it was re-used sometime during the Classic period for agave production. However, nearly all of the utilitarian pottery here was Wingfield

rather than Tonto.

Although AR-03-12-01-1355 indicates that these people were accessing some of the same social and economic networks as the Rosalie/Brooklyn folk, the ceramic assemblages of these new sites are clearly dominated by Wingfield Plain and Red. Site NA 13306, located where Lousy Canyon first reaches the top of the mesa, has very little on it but Wingfield Plain.

The third Sacaton phase expansion zone is the one along the south edge of the mesa, along Squaw Creek. As Figure 2 illustrates, these sites appear to be strung out at almost regular intervals between Point Extreme and Brooklyn Basin. One of these, AR-03-12-01-54, appears to represent the initial occupation of the Squaw Creek Ruin location.

All of these new Sacaton phase, southern mesa sites carry much the same ceramic signature; the majority of the pottery is Wingfield Plain, with smaller amounts of Wingfield Red and Tonto Plain (Verde variety). The decorated pottery consists primarily of Sacaton Red-on-buff and Black Mesa Black-on-white (sometimes also Kana'a Black-on-white). Another type that consistently occurs, again, is Deadmans Black-on-red. Because of the very strong association between these sites and Wingfield pottery, and the strong overall similarity in the decorated portion of the assemblages of all the Preclassic sites on Perry Mesa, it is tempting to suggest that the Sacaton phase represents the initial introduction of Wingfield potteries to Perry Mesa, brought in with the incursion of Hohokam folk from a different place of origin than the "founder villages". If so, that might allow us to use the presence of that pottery as a temporal diagnostic for the period AD 950 -1300. However, until we have excavation data to test that idea and further study of the pottery itself (e.g. Abbott and Lack, this edition), it remains only a tempting speculation.

These new southern mesa, Sacaton phase sites also share other consistencies beside ceramic assemblage. All of them have plentiful tabular rhyolite mesal knives and fragments. Nearly all of them contain roasting pits with both fire cracked rock and slag, and most of them are pretty small, often much less than 0.5 ha in size. As well, most of them are located within "caliche islands," that is, localized exposures of caliche substrate or high concentrations of caliche gravel in the basalt soils. The roasters associated with these sites are almost invariably located within the caliche islands, even when the artifact scatters extend beyond them. Curiously enough, most of them are also located in areas where there are concentrations of native agave as well as rough agricultural features of the type generally associated with agave cultivation. Caliche islands I've visited in areas without agave tend not to have roasters or much cultural material at all. So far, the distribution of caliche island sites favors the southern end of the mesa, since there appear to be fewer of them in the northern part. That being said, however, one of the largest of the Sacaton sites, NA13304, is located on one of the flanks of Joe's Hill, between Lousy and Perry Tank canyons (Figure 2).

While most of these Sacaton sites may turn out to be just seasonal mesal camps, several of them are substantial enough to suggest that they may have been longer term settlements. However, by the Early Classic period, few of these sites remained occupied, though the areas where they were located became dotted with Classic period fieldhouses that could have served much the same purpose. The exceptions are Brooklyn Basin and the Rosalie Mine area, the Squaw Creek Ruin locality, and the Lousy Canyon settlement cluster. All three of these became the focus of permanent settlement during the Early and Late Classic periods.

Cornstalk Flat appears to have been abandoned completely. The mesa center, after the abandonment of NA13304 and shift of population to the edge of Perry Tank Canyon, saw continued occupation, characterized only by fieldhouses and agricultural facilities, most of them frustratingly undated.

Along the southern edge of the mesa, one of the Preclassic sites was reoccupied, but not convincingly until the Late Classic. However, the several access points up onto the mesa from Squaw Creek were covered during the Early Classic by fortified/defensive sites on spurs below the mesa top, overlooking the canyon, including the Point Extreme site (AZ N:16:47 [PC]), another nearby site (AZ N:16:54 [PC]), the Mine Overlook Fort (AR-03-12-01-1256, aka NA13470), and Squaw Creek Ruin itself (AR-03-12-01-55). In Brooklyn Basin, the old Preclassic pithouse village was abandoned, never to be reoccupied again, though there is an Early Classic occupation nearby (e.g. AR-03-12-01-1758, 1759). Most surprising is the abandonment of North Campbell, the largest and most substantial of the lot. Of all the Preclassic settlements or camps operating during the Sacaton phase, only two sites in the Rosalie area (AR-03-12-01-32 and 1342) and the Lousy Canyon cluster have strong indications of in situ continuity. There may be others, of course, obscured by the overwhelming volumes of architecture and trash at the Late Classic centers, but from surface data, this is what we can see today.

There are also a few Preclassic sites on Black Mesa (North 2002). The best appears to be a small pithouse area similar to those on the east side of Perry Mesa. Located out in the middle of Black Mesa, this site (AZ N:16:216 [ASM]), with no surface features, was recorded as having a ceramic assemblage consisting of mostly "Gila Plain," a lot of Wingfield Plain, Sacaton Red-on-buff, Kana'a Black-on-white, and other Tusayan White Ware, along with a bit of Medicine Black-on-red.

The Early Classic occupation of Perry Mesa (Figure 3) has been problematic for some time, largely because so little of it remains "untainted" by the Late Classic occupation, and so has been hard to recognize. Most site maps don't convey variations in architectural style or construction methods or materials between sites, much less within them, making it difficult to differentiate between periods of construction so that the only way, in most cases, to identify earlier components at the larger sites has been through ceramic markers. Unfortunately, many site records don't include adequate descriptions of the pottery or have little consistency in the type names used to identify them. Nor does it help that the architectural style and construction techniques used for the Late Classic settlements on Perry Mesa are pretty much the same as those used during the Early Classic period in the Bradshaw Mountain foothills and New River areas. This leaves us with the ceramic signature described above as the best (and sometimes only) tool for identifying Early Classic occupation at many sites and, given the relative

rarity of all decorated pottery on the surface of Perry Mesa these days, that often boils down to the presence or absence of Wingfield Plain and Red.

In Brooklyn Basin, the Early Classic is represented by several small settlements of boulder-founded jacal construction. Several of these sites (e.g. AR-03-12-01-1759) include elements similar to Hohokam or Salado compounds, while others (e.g. AR-03-12-01-41, 1758) are small room blocks. None contain more than about ten rooms. Most of the Early Classic sites in Brooklyn Basin are concentrated in the same area as the Late Classic sites, but there are others scattered along the ridges and benches, all the way down to the ridge just below Squaw Creek Ruin, where there is a five- to ten-room, granite boulder compound containing a mix of Tonto Plain and Red and Wingfield Plain on a bench overlooking the creek (Mike Hoogendyk, personal communication 2011). Throughout the basin, there are small (one to four rooms) homesteads and terraced farming sites scattered across the catclaw infested granite ridges. Altogether, a best guess would be that there are somewhere between 30 and 50 Early Classic rooms in the basin.

Nearly all of these sites are free of Late Classic material or construction, and so appear to have been abandoned by the end of the Early Classic, but there are several others, two off the mesa and the others topside, that appear to have formed the basis for Late Classic room blocks. One off-mesa site, AR-03-12-01-45, with seventy plus rooms in two large, full masonry, Late Classic room blocks, has a smaller, less substantial eight-room block, what appears to be the remains of a small boulder-outline compound, and a small cluster of detached, boulder-outlined rooms with Wingfield Plain, Little Colorado White Ware, and Tusayan Black-on-white, all within about 200 m of the Preclassic pit-house site AR-03-12-01-1760. Another off-mesa site is the Wagner Ruin, AR-03-12-01-72, spread out along the crest of a long ridge that dominates the basin and is nearly level with the top of the mesa. It is a fairly typical Late Classic Perry Mesa site, despite its odd location. It has five separate room blocks, totaling about 70 rooms, with three intervening plaza areas defined by retaining walls. The architecture and the bulk of the ceramics are both typical Late Classic. However, one of the cemetery plazas, extensively vandalized, has a concentration of smudged Tonto Plain and Red, Wingfield Plain and Red, Walnut Black-on-white, and other unidentifiable sherds of Little Colorado White Ware.

Another Brooklyn Basin site with an early component is Brooklyn Camp Ruin, AR-03-12-01-42, which consists of a massive, full masonry structure near the edge of the mesa top, containing about 60 rooms (42A) that is surrounded by a number of small outliers and agricultural features, much like any other large, Late Classic Perry Mesa site. However, one of these outliers (42B) is a group of about six contiguous and detached,

boulder-founded rooms just off its northwest corner, and several nearby, low boulder-line walls that seem to originate from under the main ruin. There is also a low, boulder-outlined, two room structure (42C), a short distance from the opposite corner of the big room block. Both of these areas are covered with Late Classic trash, flowing off of the big ruin; amongst all of that are sherds of Walnut Black-on-white and Wingfield Plain at 42B and Wingfield Plain and Tonto Red at 42C. A third boulder-outlined structure with three rooms (42K), located off of the northeast corner of the room block, had some Tsegi Orange Ware as well (see also Snow and Abbott 2012; the collection transects for that study missed all three of these loci, but they did recover several additional Wingfield sherds on the south side of the main ruin, near 42C, and on the west side, near 42B).

A similar situation can also be found at the Brooklyn Rim Ruins, AR-03-12-01-43, only a few hundred meters away from 42A. The largest of this cluster of three large room blocks and small outliers is a massive, 80-plus-room, masonry structure (43B). The outwash of Late Classic trash surrounding this structure has literally buried several outliers, but there are boulder wall alignments still visible at the south end of the structure, and one can occasionally find Wingfield Plain and Red sherds scattered throughout the trash.

A similar situation obtains at Rosalie. AR-03-12-01-32 continued to be occupied into the Early Classic, with only slight horizontal displacement. It is dominated by its 20-room, Late Classic room block, but there are several boulder-outlined wall alignments originating under the massive rubble mound, and a couple of detached, boulder-founded rooms less than 30 m to the northwest. Late Classic trash overwhelms the surface assemblage of the site, but scattered within it are sherds of Wingfield Plain and Red, Tonto Red, Prescott Plain, Tusayan Black-on-white, and Winslow Black-on-orange or Polychrome.

At AR-03-12-01-1342, the Preclassic component is partially overlain by a small boulder-founded structure of about five to nine rooms, with four detached, single-room outliers. There are no full masonry structures. The ceramic assemblage fits the typical Early Classic signature. There were also a few sherds of Gila Polychrome and Jeddito Yellow Ware.

And then there is Big Rosalie herself, AR-03-12-01-1292, at well over a hundred rooms, the single largest structural complex on Perry Mesa. Clearly dominated by its Late Classic occupation, it has a number of Early Classic structural elements, mostly around the central plaza area, where there are low-walled, boulder-outlined and truncated structures within it and around its edges. Pot-hunter backdirt from several of the cemetery areas exhibits the full Early Classic signature. The massive, Late Classic building program that resulted in this commanding site on the hill may have obscured its humble beginnings, but they are leaking out the sides.

Finally, there is AR-03-12-01-30, a compound-like structure between 32 and 1342, built with boulder-founded, low walls, with Walnut Black-on-white mixed in among the later polished redwares, yellow wares, and polychromes.

Squaw Creek Ruin (AR-03-12-01-55) needs more work. Its outliers overlap the adjacent caliche island site AR-03-12-01-54. I recently discovered a series of seven detached, boulder-founded jacal rooms, just outside the compound wall of the main ruin and stringing out to the west, near the edge of the mesa. I also found several slab-faced, oval pithouses or pit rooms in the same area. The pottery on these structures was predominantly Wingfield Plain and Red, with a few sherds of Little Colorado White Ware. The previously recorded single- and multi-room outliers surrounding the main ruin and overlapping AR-03-12-01-54 contain Wingfield Plain amongst the Late Classic trash, and the big outlier with all the slag roasters on the road into Squaw Creek Ruin (55B) also has Wingfield Plain mixed in with its later pottery. Nearby, a newly recorded site, AR-03-12-01-1924, a single, detached, low-walled room with a cluster of slag roasters, has a substantial amount of Wingfield Plain and at least one sherd of Prescott Black-on-plain.

Going back to the maps (Figure 3), we see that the Lousy Canyon settlement cluster has expanded, and now includes a fort of its own (NA13350/AZ N:16:87 [SIU]) and several residential and agricultural developments on the natural terraces between topside and the Agua Fria River. Two of these sites developed into Late Classic room blocks of 40 plus rooms each, so it's hard to tell what their Early Classic size might have been, but the others in the cluster are small, between five and 20 rooms, for a total of somewhere between 35 and 55 rooms, about the size of a single, typical Late Classic room block.

Along Perry Tank Canyon, near what would become the Pueblo Pato cluster, there are several new Early Classic settlements on the south side of the canyon. There may be additional Early Classic sites or components nearby, and perhaps even earlier material around Batt Tank, on the north side of Pato, but the available inventory is not enlightening in that regard. Bishop Creek appears to be another area first settled during the Early Classic, with a strong showing in the Baby Canyon section. A small site down in the canyon, AZ N:16:51 (PC), consists of a small, rambling room block and a compound-like structure with two courtyards and a couple of attached rooms. The ceramic assemblage is lacking in decorated pottery but contains Tonto Plain and Red (Verde variety), lesser amounts of Wingfield Plain and Red, and a little bit of Prescott Plain. There are ceramic indicators of an Early Classic period occupation within the large Baby Canyon Ruin (NA12556/AZ N:16:45a [PC]), which is primarily a Late Classic settlement that may have as many as 70 or more rooms in all its loci. A bit farther up the canyon, there is a small block of

perhaps 14 rooms, with a ceramic assemblage consisting of Tonto Plain and Red and Wingfield Plain and Red in nearly equal amounts, with a few sherds of Tusayan White Ware, "San Francisco Mountain Gray Ware," Gila Plain, and Prescott Plain.

Then there is AZ N:16:46 (PC). A few hundred meters east of the Baby Canyon Ruin, it consists of two room blocks, one topside, near the edge, and the other, smaller one, built into the rocks on a spur ridge just below, sticking out into the canyon, much like the one at Point Extreme. There is also a small, two-room compound close to one of the blocks. The ceramics here are dominated by Tonto Plain and Red, Wingfield Plain and Red, and what CAEP was calling Gila Plain, along with a smattering of Prescott Plain (which they called Verde Grey). What makes this site, which has no Polychrome/yellow ware overlay and very little high polished redware, most interesting is that the topside unit is a block structure of 20 to 25 masonry rooms very similar in appearance and construction to the large, Late Classic room blocks of Perry Mesa. It is also very similar to the Early Classic room blocks of the Bradshaw Mountains foothills, sites like the Golden Turkey Ruin (AR-03-09-05-15) or AR-03-09-05-03 on the Prescott National Forest, which were also characterized by a ceramic assemblage composed of Wingfield Plain and Red, "Verde Brown" and Red (what I would call Tonto Plain and Red, Verde variety), Prescott Plain, and Gila Plain. With no apparent Late Classic overlay, it would seem that AZ N:16:46 (PC) was replaced by developments at the larger, nearby Baby Canyon Ruin.

Finally, there are the new Early Classic period developments on and around the edges of Black Mesa. As we saw earlier, there was a small Preclassic presence on the Mesa, but the Early Classic occupation was primarily off of the mesa top, focused on Alkali Canyon, on the northwest side. Here there were fortified masonry structures (NA25981 and NA5957) on two ridge points, on either side of the canyon, just below the top. They overlook the sprawling settlement of Running Deer Ruin, AZ N:16:168 (ASM) (which combines, I believe, NA5855 and NA5856). With two Bradshaw-style room blocks, small compounds similar to those in the Cline Creek/New River area, and dozens of detached rooms spread across a natural terrace, this site has easily more than 100 rooms altogether, making it the largest known population concentration in the immediate Perry Mesa area during the Early Classic. There is no indication from the ceramic assemblage (North 2002) that there is much of a Preclassic component to the site, nor is there any indication that it continued into the Late Classic. Its ceramic assemblage fits the Early Classic signature and has no late polychromes or yellow ware.

Topside on Black Mesa, there is not all that much recorded for the Early Classic other than a few 10- to 15-room sites and fieldhouses called "PIII" by MNA but without ceramic information. NA13308 is often listed

as an Early Classic, fortified site on the narrow access ridge between the Agua Fria River and the mesa top. It does, indeed, have Wingfield pottery and even a little buffware, but it has only three detached, low-walled houses strung along the ridge crest. Back on top, there is NA13311, in what would become the Badger Springs Ruin complex; a cluster of detached rooms with a small room block in the middle. The ceramic signature, though it included late polished redware, polychromes, and yellow ware, had a lot of Wingfield, suggesting that there is at least an Early Classic component. Nearby, there is an agricultural complex with a few more detached rooms (AZ N:16:206 [ASM]) and a Wingfield component to a ceramic assemblage with a fair amount of polished redware, suggesting continued use over the Early and Late Classic periods. The two large sites on Black Mesa, Badger Springs Ruin and Richinbar Ruin, which together would just about hold all of the population of Running Deer, both appear to be Late Classic period developments, as no Early Classic ceramic types have been recorded at either one of them (North 2002). So, the situation on Black Mesa appears to be similar to that on Perry Mesa: Preclassic sites on the mesa top, Early Classic sites off or around the edges, with a relatively small population clustered in locations that would become population centers in the Late Classic.

This brings us to Figure 4 and the Late Classic. Comparison to Figure 3 shows the distribution of sites to be actually quite similar between the two periods, but the distribution of population (by room counts) is not. At least one area appears to have dropped out: the southern edge of Perry Mesa. Except for a couple of small farmsteads and mescal camps, Late Classic occupation essentially ends at Squaw Creek Ruin and the access forts facing into Squaw Creek are abandoned. The oldest site clusters on the mesa – Brooklyn, Rosalie, Squaw Creek, and Lousy Canyon – all flourished during the Late Classic and saw massive and apparently sudden gains in population. There are also three new settlement clusters that appear to have developed during the Late Classic, in places where there was essentially no previous occupation: Black Mesa, Pueblo Pato, and La Plata.

Black Mesa is probably the easiest to explain. Running Deer is made up of two clusters of residential structures, each with a central room block. These folks probably just moved their whole operation up onto the mesa top, found two places with water, and established the Badger Springs and Richinbar settlements. The various forts around the edges of Black Mesa, however, all appear to have been abandoned.

Pueblo Pato and La Plata are a little less obvious as places to settle. Pato, ringed by cliffs on three sides, is isolated from the rest of the mesa and appears to have had little to attract previous settlers, though it does offer an excellent defensive advantage. In any case, once settled, it grew in size to rival the older centers of Rosalie and Brooklyn. La Plata appears to have had no ante-

cedent population at all. Its primary locational advantage may have been ease of access to the Agua Fria and trails leading to the Verde Valley and Bloody Basin. It is also the only one of the major sites that is not the center of a cluster of settlements, having only a few close outliers. Thus, it is the smallest and possibly latest of the Late Classic settlement clusters on Perry Mesa, perhaps having less of a community defense function but more of a transportation advantage that allowed it to operate as a trading center for the rest of the mesa, which might explain its higher volume of decorated pottery than any of the other sites on Perry Mesa. One might assume, then, that it wasn't even founded until the place had settled down after the disruptive period of the Great Drought and folks had enough time to establish themselves, expand their agricultural facilities, and begin producing surpluses. Further ceramic studies of this site, however, could change every aspect of this interpretation.

And that is the case for nearly everything presented here. The evidence for temporal ordering of settlements on Perry Mesa is not overwhelming. It is based on surface ceramic signatures from a broad sample of sites, nearly all of which have been altered by illegal collecting and pothunting. Nevertheless, there does seem to be something of a recognizable temporal/geographic pattern. The ceramic period occupation of Perry Mesa began with Hohokam folk settling in small numbers at or near springs along the mountain/mesa interface zone on the east side some time around AD 750. During the Sacaton phase, Hohokam interest in Perry Mesa grew, and new camps and settlements appeared in areas with a lot of agave, bringing in a new ceramic assemblage characterized by Wingfield potteries that dominated the new sites and were added to assemblages of the earlier sites, who had been using mostly sand-tempered Tonto Plainwares. These new sites tend to follow two patterns – small camps (probably seasonal, in areas with both agave and caliche islands) and small farming settlements in other locations.

The Early Classic saw a partial disconformity in the stratigraphy of settlement on the mesa. There was new growth and construction at four of the Preclassic sites, but the bulk of them were abandoned. At the same time, the Early Classic seems to show a significant expansion in numbers and locations of settlements, though the overall population, seemingly much larger than it was during the Preclassic, was still much, much smaller than it would be during the subsequent Late Classic. The Early Classic also introduced the area to defensive architecture, most of it placed in locations to protect access onto the mesas (Wilcox et al. Wood 2001a). Some of these Early Classic clusters were abandoned, some continued and grew during the Late Classic, and some rose up where no one had lived before. In any case, the forts of the Early Classic, probably most active during the period just prior to AD 1300, had apparently accomplished their mission and were not used during the fourteenth century.

This leads to a second disconformity between the Early and Late Classic periods. There was an Early Classic occupation of Perry Mesa, as we've seen, but it was relatively small compared to that of the Late Classic. We can assume that this was the result of immigration during the time of the Great Drought; after all, as the inventory for the Prescott National Forest (as just one example) clearly shows, the entire Prescott, Bradshaw, and Upper Hasayampa highland areas were all abandoned before AD 1300 and never reoccupied until the Apache and Yavapai showed up centuries later. The drought and conflict arising from it may have killed a lot of those people, but the ones who survived had to go somewhere. Population displacement and social engineering to adapt were going on in other parts of the Southwest at this time, like Tonto Basin (Wood 2000); it's reasonable to assume that the drought had similar effects throughout central Arizona during the years between AD 1280 and 1300.

Put a little more simply, what all this means is that there was an antecedent population on Perry Mesa prior to the Late Classic period, going back to some of the earliest Hohokam expansions out of the Salt-Gila Basin and continuing through the Early Classic. This population waxed and waned, gaining people from several different places at different times, but appears never to have been very large. This supports the idea that the Late Classic, probably beginning around 1280 or so, saw a huge increase in population over what had been living there prior to that time. What we need to do now is find out exactly where all those people came from, though I suspect that we will not have to look very far away.

Dating for all of this, despite the pottery type signature method I used here, remains a problem, however. Even as we can place them into specific periods, based on their surface assemblages, we may not know how long they may have been occupied during those periods, or how quickly their occupants arrived, or how long it took to abandon them. Does this mean that the defensive model that Wilcox, Robertson, and I offered a decade ago has failed, and that the people of Perry Mesa were simply peaceful farmers living in an agricultural utopia? Of course not (you expected me to say otherwise?), but it does mean that it, like any model, needs to be looked at more closely in the light of new information. We had always assumed that there was an antecedent population on Perry Mesa prior to 1300; that much comes as no surprise. The fact that the forts and any presumed communication system tied to them were often undatable, and that those that could be dated were restricted to the Early Classic period only, and so could not actually have been a part of the fourteenth century settlement and conflict management system, did.

And yet, it doesn't really change things that much. Climatic variations within the Great Drought would have made Perry Mesa, with its 1000 ft high orographic barrier in the Agua Fria storm track, its spring line at the foot of Hutch Mesa, and its moisture-retaining clay soils

something of an oasis between AD 1280 and 1300, and a serious attractant to folks suffering from the damage done to their traditional upland farming economies (Abbott et al. 2008). The fort system, which appears to date to this same period, could have been necessary during the migration years, as displaced folks from other parts of central Arizona came together on the mesa, but it may have proved unnecessary once the newly enlarged population of the mesa, living in massive, easily defended, masonry room blocks, had settled in around the edge of the mesa, at or near its strategic access points.

So, must we now say that Perry Mesa was not "organized for war?" Not at all – just that the fourteenth century system was not an immediate reaction to a period of active warfare and conflict over dwindling, drought-restricted resources such as might have provided the context in which refugees fled to Perry Mesa from their abandoned homelands. Instead, we should see it as a strategic response to a post-war environment, where conflict was part of a complex set of inter-tribal relationships involving alliance formation and long distance trade co-dependencies, fueled by agricultural surpluses in the climatically favored oases of that period.

However, this is not the place for a new developmental model for Perry Mesa, or to critique any old ones. My purpose here was to describe what has been recorded, and to try to identify those sites on Perry Mesa and Black Mesa that can be reasonably assigned to earlier time periods to facilitate the synthesis of a new model.

Note:

1. Many researchers use the Pecos Classification to describe time periods on Perry Mesa, despite the fact that it lacks anything but commodity trade pottery from any Puebloan culture. I will use the Hohokam classification to reflect its clearly Hohokam and Central Arizona Tradition origins.

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Cover: A collection of Friends of the Agua Fria National Monument visit the Mystic Lizard site on Perry Mesa in 2011. L-R: Lee Gehl, Susan Gehl, name unknown, Mike Hoogendyk, Nancy Stallard, Shirley Anderson, Trudy Mertens, Albert Enouen, Jo Brookshier, and Shelley Rasmussen. Image by Pat Gorraiz.