Mogollon Snowbirds:

Where did they go for the winter?

A research paper for

ASB 567

by
Paul Wren

Introduction

The transition from seasonal round to a sedentary life way in the Mogollon area (as well as in other regions of the Southwest) is a subject of great interest. The archaeological record provides significant evidence of sites which represent year-round occupation, but the seasonally-occupied sites are not so well represented, nor as easily recognized. This is likely a natural consequence of both the amount of time that has passed since the transition to sedentism, and the less permanent nature of seasonal sites.

Locating and studying seasonally-occupied sites in the Mogollon region is essential to accurately describing and interpreting the transition to sedentism. It is likely that Mogollon pithouses from (or contemporaneous to) the Pine Lawn phase (Martin 1943) which do not feature interior hearths represent summer occupation only, given the cold winters in the area (Glen Rice, personal conversation).

If these are indeed summer residences, where are the winter sites? Since they will likely have interior hearths, pithouses occupied in the winter are difficult to distinguish from year-round highland sites. Even without such an obvious indicator as the presence or absence of interior hearths, I believe criteria exist which can, when combined, be used to reveal seasonal sites occupied during the winter.

I am concerned with sites which fall into the "early pithouse" period, which spans roughly A.D. 200-500 and is known by different phases in different areas (see Table 1).

Region	Early Phase
Forestdale Valley	Hilltop
Reserve Area	Pine Lawn
San Simon	Penásco

Table 1: Early Pithouse Cultural Phases
(Haury 1985, Martin 1943, Sayles 1945)

My plan is to survey existing site reports of early Mogollon pithouse villages, and apply the following criteria in an attempt to identify winter seasonal sites. I have identified the following pithouse village features and attributes as potential indicators of seasonal occupation:

Storage Pits

A seasonal site should contain more storage pits than a year-round site, specifically to cache tools which are difficult to carry or prove useful in exploiting only the local environment.

Pithouse Construction Quality

One would expect that houses in a permanent settlement exhibit greater effort and care in terms of construction techniques and materials. Alternatively, one might expect that houses occupied seasonally, and then typically for only a few seasons, would be built with less effort and represent a lower quality of construction. Even though a number of criteria could be used to judge overall construction quality, the site data available in the literature restricted my sampling to the number of postholes per pithouse, the regularity of pithouse shape, and the variance in house diameter within a single site. I have combined this information into an index which (hopefully) measures house construction quality. This index is described in a later section.

Burials

If people are living in a particular spot only half of the year, they will only bury half of their dead there. While this may be obvious, it is a difficult indicator to measure. It is not enough to compare the number of burials per village. It is not even sufficient to compare the number of burials per household-- because the length of occupation directly affects the number of burials at a site. To be meaningful, the desired measurement is the number of burials per capita, per time period. Given the nature of existing site reports (while interior burials are reported, cemeteries are seldom sought out) and the difficulty in precisely determining the period of site occupation, this promises to be the weakest criterion. I will attempt to record the total number of burials at a site, as well as the total number of pithouses (this can be roughly converted to the number of residents), and the estimated duration of occupation.

Interior Hearths

While the presence of interior hearths is not an indicator of winter sites, their absence can certainly be used to eliminate candidates from consideration.

Research Approach

After an extensive search of available publications, I identified the following archaeological site reports as potential sources of useful data:

Duncan Site (Lightfoot 1984)
Bluff Site (Haury 1985)
Bear Ruin (Haury 1985)
Harris Village (Haury 1986)
Mogollon Village (Haury 1986)
SU Site (Martin 1940-43)
Turkey Foot Ridge Site (Martin and Rinaldo 1950)
Flattop Ruin (Wendorf 1953)
Crooked Ridge Village (Wheat 1954)
Nantack Village (Breternitz 1959)
Starkweather Ruin (Nesbitt 1938)
Promontory (Martin, Rinaldo, and Antevs 1949)
Swarts Ruin (Cosgrove 1932)
Cameron Creek Village (Bradfield 1931)
San Simon Village (Sayles 1945)
Cave Creek (Sayles 1945)

For this study, I created a data recording form to use when extracting information from each site report (facsimiles of the completed forms can be found in Appendix A). This form included the following fields:

<u>Site Information</u>
1. Elevation
2. Estimated period of occupation
3. Number of burials
4. Number of early pithouses
5. Number of exterior pits and their maximum diameter, maximum depth

Pithouse Information

1. Greatest diameter
2. Number of interior hearths
3. Number of interior storage pits
4. Number of primary postholes
5. Shape = Circular ("C"), Rectangular ("R"), or Irregular ("I")
6. Any other interesting architectural features
7. Assigned Phase or Dates

Data Overview

Upon closer examination of all site reports, I determined that some of the sites I had chosen were not appropriate for this study. I excluded the Swarts Ruin (Cosgrove 1932), Nantack Village (Breternitz 1959), and San Simon Village (Sayles 1945) as they represented later period pithouse villages. I originally recorded data from Nesbitt's 1938 report on Starkweather Ruin (the summary report for this site can still be found in Appendix A), but excluded it from statistical analysis because it does not seem to fit well with the other sites-- the lack of interior hearths, high count of interior pits and high variance in diameter are at odds with the regularity of house shape and later phase assignment by the excavator.

Figure 1 is a map which shows the location of each site included in my analysis.

For several sites, I recorded information for certain pithouses which I later excluded from the analysis for various reasons (on the summary reports in Appendix A, these are the pithouses appearing at the bottom of the table and separated from the houses by a blank line). For statistical analysis, my goal was to include for each site only residential structures from the primary cultural phase which the site represented.

For the Bluff Site (Haury 1985), I excluded House 5 as Haury believed it to be a ceremonial structure, and I excluded Houses 11, 14, 19, and 19a since they are assigned to the Cottonwood and Corduroy phases.

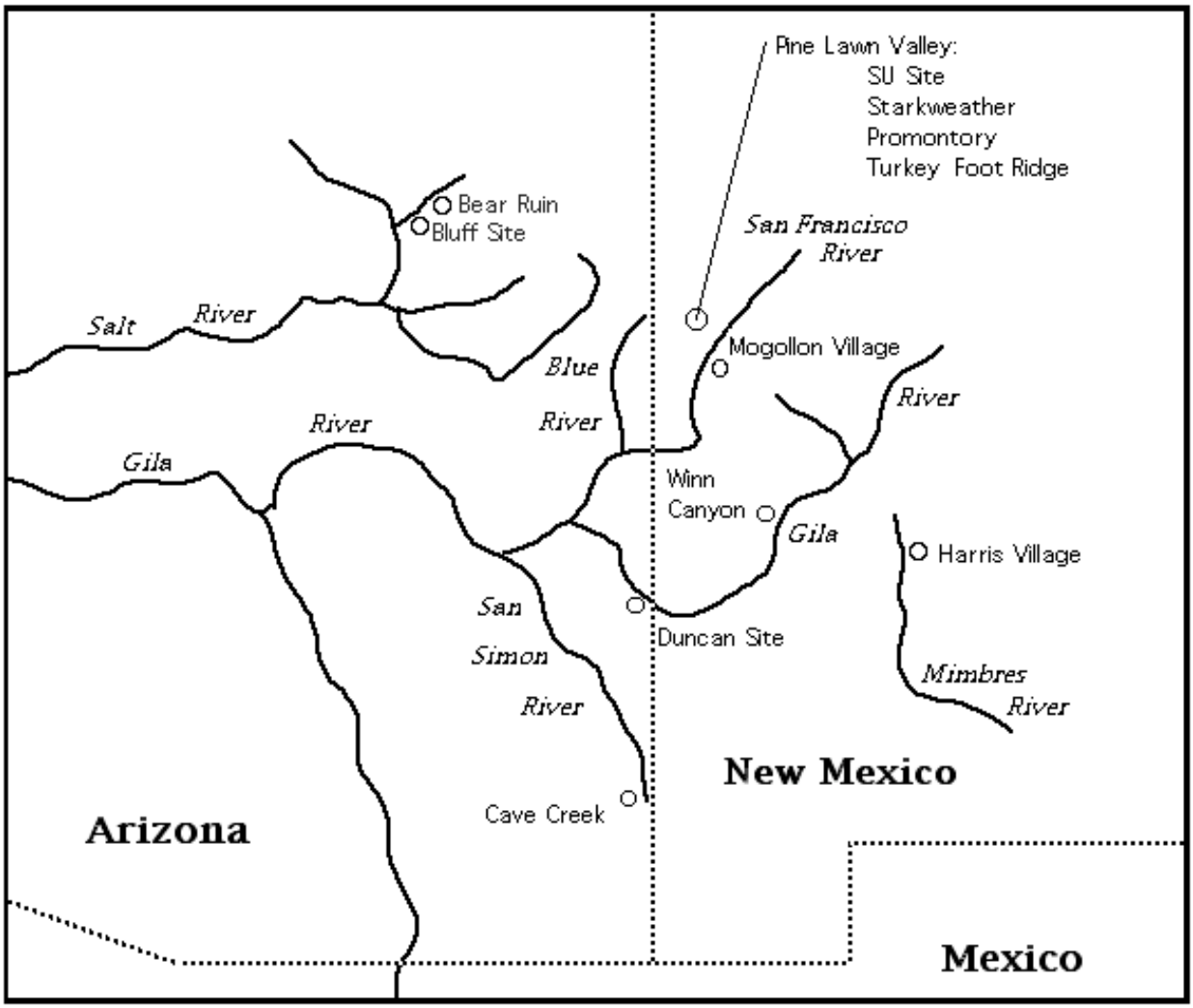

Figure 1: Early Mogollon Pithouse Sites

I excluded Pithouse A and Pithouse V at the SU Site (Martin 1940, Martin and Rinaldo 1947) from analysis since they appear to be ceremonial.

At Promontory, another site excavated by Martin and others (1949), I excluded Pithouse B from analysis as it also appears to be ceremonial.

Room 2 at the Winn Canyon Site (Fitting 1973) is distinguished from the other pithouses at the site by its larger size and complex interior

Site	Occupied	Elev (feet)	Burials	Early Houses	Average Diameter	% with Hearths	Pits per House	Average Postholes
Duncan Site	A.D. 200-400	3760	0	9	3.85	0%	0.75	2.50
Cave Creek	A.D. 200-500	3700	3	7	3.53	100%	0.00	0.14
Bluff Site	A.D. 200-400	6500	2	13	4.49	23%	0.46	0.46
SU Site	A.D. 200-500	6440	54	23	6.45	15%	4.75	5.60
Promontory	?-A.D. 500	6400	0	5	5.07	25%	2.25	1.25
Winn Canyon	A.D. 300-500	4610	7	5	5.44	80%	1.20	0.80
Starkweather Ruin	A.D. 500-900	6068	3	6	4.38	0%	3.25	3.50
Harris Village	A.D. 500-700	6068	48	5	4.20	75%	0.25	0.50
Bear Ruin	A.D. 600-800	6560	40	14	5.21	100%	1.64	3.50
Turkey Foot Ridge	A.D. 700-900	6400	0	12	4.90	67%	1.08	6.67
Mogollon Village	A.D. 900	5576	8	8	4.69	100%	0.50	2.12

Table 2: Summary of Pithouse Sites

features. Fitting interpreted Room 2 as a ceremonial room, and for that reason I have excluded it from analysis.

House 34 at Harris Village (Haury 1986) is excluded from the analysis data since almost none of the desired data points were available in the site report.

At the Turkey Foot Ridge site (Martin and Rinaldo 1950), I excluded Pit House K as a ceremonial room on the basis of its larger size, as well as the unique rectangular area in the center which is defined by four partially buried logs.

Finally, I am excluding houses 3 and 5A at the Mogollon Village, since Haury (1986) identified them as possible ceremonial structures.

Table 2 provides a summary of the data collected for all sites. I have ordered the sites roughly in chronological order.

The reader should note that I have not included information on the external storage pits (i.e., those outside of pithouses) at each site. It is my opinion that the sparse information which I did collect does not accurately reflect the true nature of external storage pits at the various sites. Many site reports did not mention external pits, and their excavation techniques obviously were not designed with the intent of locating such pits. Some reports mentioned storage pits, but failed to quantify them or describe them in any way.

I would also like to point out that the dates presented in the "Occupied" column are not meant to imply that the sites were occupied throughout the specified range, but rather that the occupation is estimated to have fallen somewhere within that range.

Figure 2 provides a graphical view of the total burials per site, divided by the number of pithouses (this translates into a number which should be proportional to burials per capita). I had hoped that burials might give some clue as to how long these people lived at a certain site, but the actual data appears to be completely useless. There is no discernable trend in the data, and I suspect that the number of burials discovered at each particular site has more to do with excavation approaches and research goals than with the actual number of inhumations.

The average number of postholes per house at each site (Figure 3) do not present obvious trends. If, however, one does not pay too much attention to the SU site or the Duncan site, it becomes apparent that the early period pithouses have fewer postholes per house. I should point out that the average house at the SU site is significantly larger in area than those at other sites. When the average house is nearly 20 feet in diameter, one should expect more roof supports.

Figure 4 shows the general trend toward smaller houses moving out of the early pithouse period, and Figure 5 supports the presumption that more interior storage pits occur in the early pithouse period.

With the notable (although not singular) exception of the Cave Creek site (see Figure 6), early pithouse villages show few interior hearths. The Winn Canyon site, representing the latest "early" pithouse village in my survey, is another exception (four out of five residences exhibited hearths), but this difference is not visually obvious due to its position on the graph.

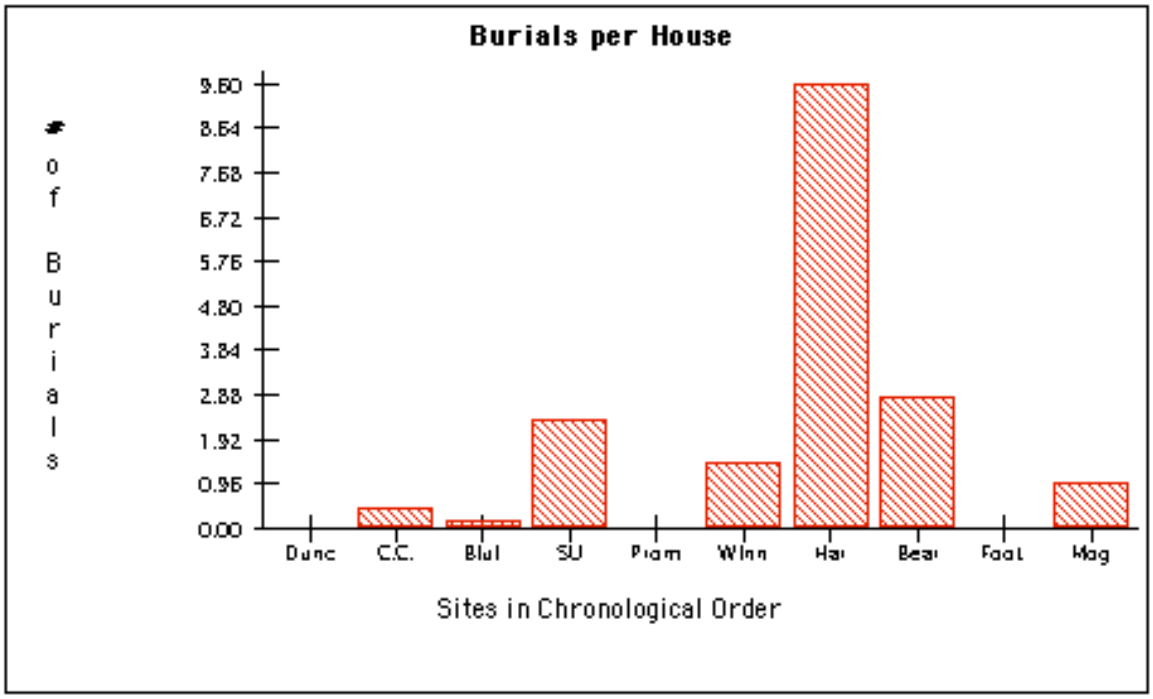

Figure 2: Burials per House, by Site

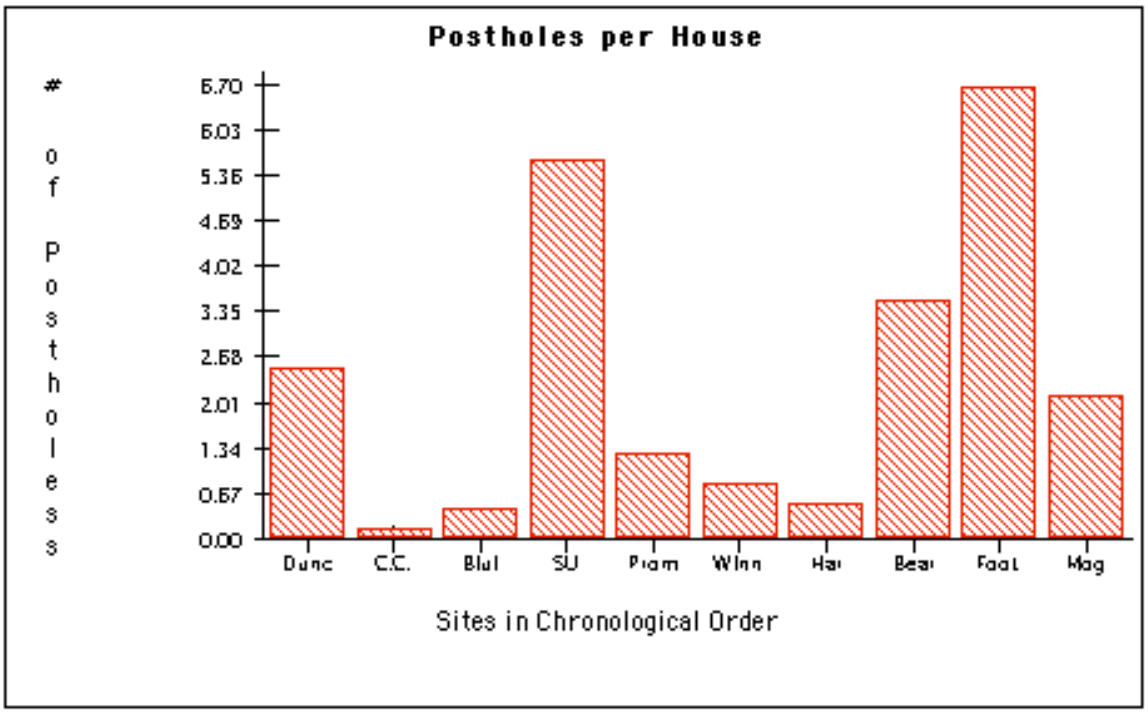

Figure 3: Average Number of Postholes per House, by Site

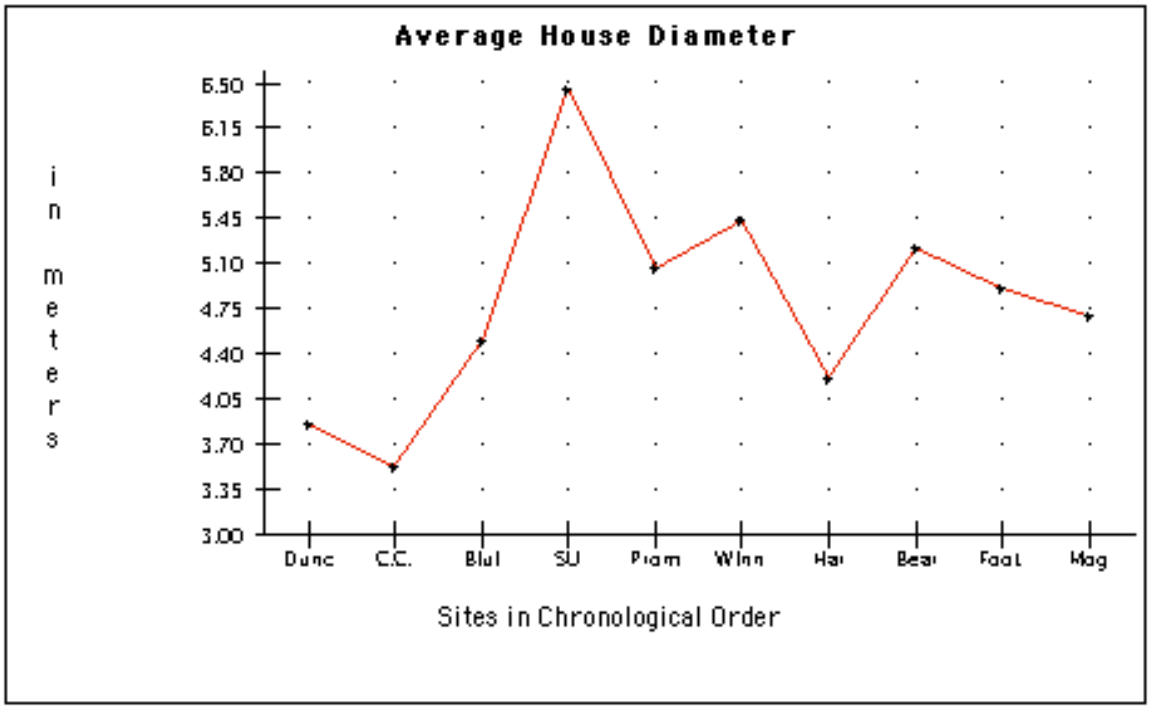

Figure 4: Average House Diameter by Site

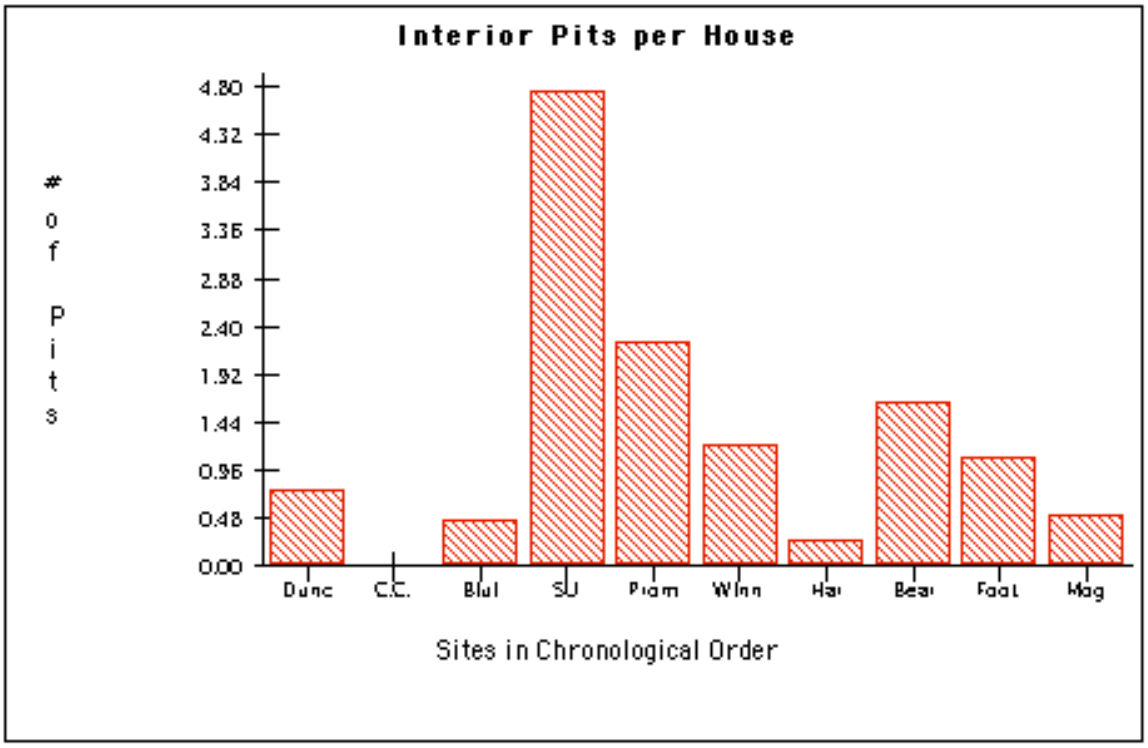

Figure 5: Average Number of Interior Pits per House, by Site

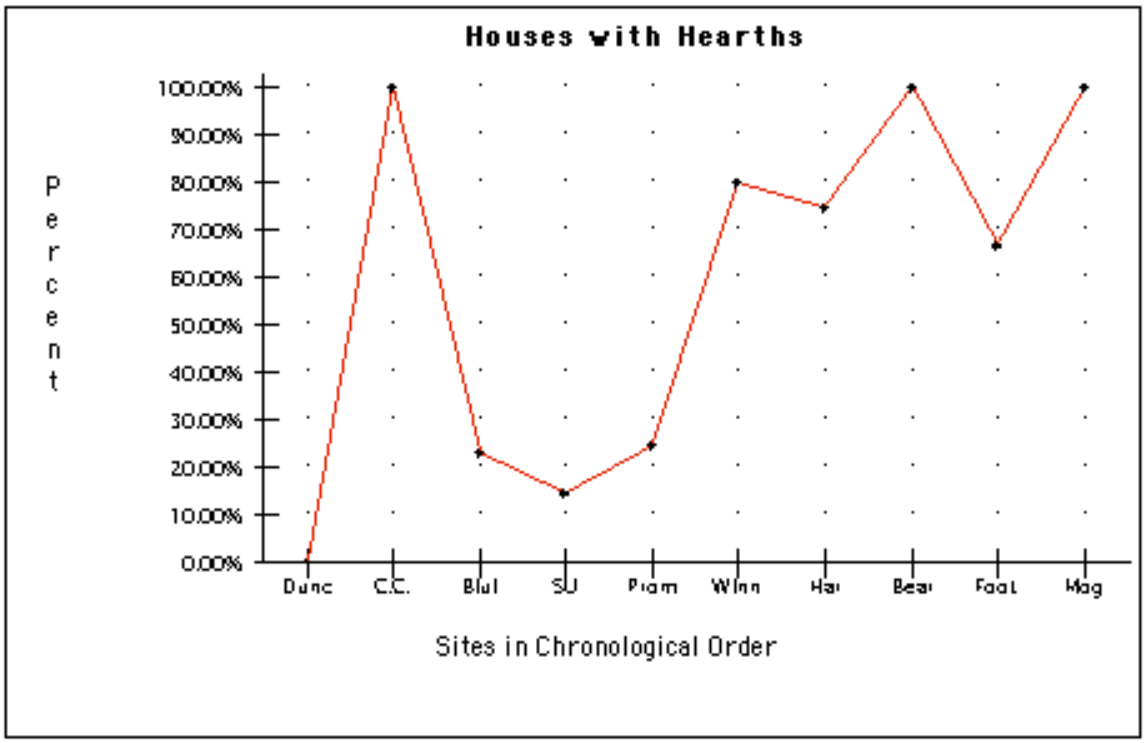

Figure 6: Percent of Pithouses with Hearths by Site

Construction Quality Metrics

To determine a measure of the construction quality represented at each site, I have combined the variance in pit house diameters and the average number of primary postholes with a number I call the *Shape Regularity Index*. This index is higher for a site which contains a larger percentage of pithouses whose shapes are "Irregular."

The Shape Regularity Index is computed by first assigning a score of zero to each house which is either circular or rectangular, and a score of five for every house whose shape is "Irregular." The average score for each site is used as its Shape Regularity Index. In other words, a site whose pithouses are all Circular or Rectangular will have an index of zero, a site containing only Irregular pithouses will have an index of five, and all other sites will fall somewhere between.

Table 3 shows the pithouse diameter variance, the mean number of primary postholes per house divided by the mean house area (and multiplied by 20 to normalize this measurement with the posthole mean), and the Shape Regularity Index for each site, as well as the composite measure of construction quality.

Site	Label	Diameter Variance	Average Postholes	Shape Index	Construction Quality Index
Duncan Site	Dunc	0.23	2.50	3.75	8.15
Cave Creek	C.C.	0.31	0.14	4.29	11.13
Bluff Site	Bluf	0.91	0.46	2.69	9.81
SU Site	SU	1.41	5.60	2.50	4.98
Promontory	Prom	1.26	1.25	2.00	8.68
Winn Canyon	Winn	0.29	0.80	1.00	7.16
Harris Village	Har	0.86	0.50	0.00	7.03
Bear Ruin	Bear	1.29	3.50	1.43	5.89
Starkweather Ruin	Stark	1.32	3.50	0.00	4.49
Turkey Foot Ridge	Foot	0.99	6.67	2.92	3.91
Mogollon Village	Mog	1.00	2.12	0.00	5.55

Table 3: Construction Quality Metrics

The formula for the construction quality measure is as follows:

$$Q_C = S_D^2 + (X_{\max} - \overline{X_P}) + I_S$$

Where S^2 is the variance of the house diameter sample, I_s is the Shape Regularity Index, X_p is the mean number of postholes per house for the site, and X_{max} is the maximum average number of postholes observed for any site.

To be able to sum up the three metrics, I needed all of the measurement scales to be oriented such that a lower value indicated higher construction quality. Since I'm assuming that more postholes indicates higher construction quality, I have inverted this scale by subtracting the posthole index from the maximum posthole value. Thus, a large posthole mean versus house area will result in a lower index. It was necessary to multiply this posthole index by a constant to normalize it with the other metrics-- I chose 20 since it resulted in a maximum value equivalent to the originally recorded maximum posthole mean.

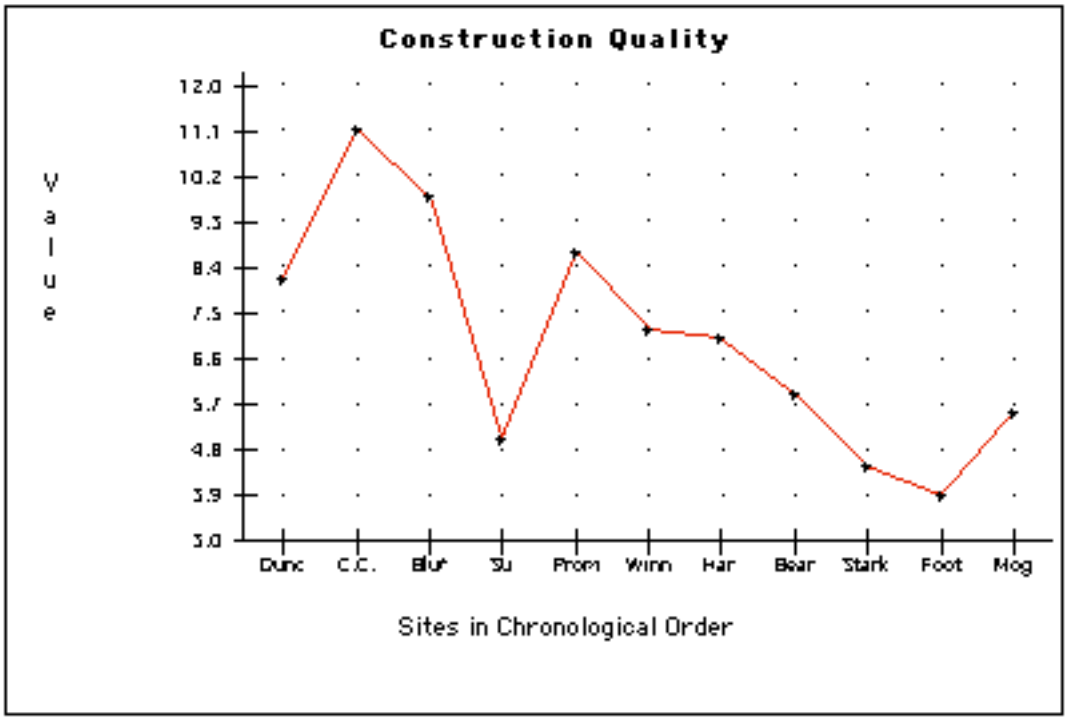

Figure 7: Construction Quality Index (Lower is better)

The graphical representation of the Construction Quality Index is certainly a gratifying one (see Figure 7), showing a definite increase in house construction quality over time. Even the most obvious anomaly-- the SU Site-- can be explained by the "inflated" posthole measurement, which is a direct result of the larger house size at the site (see previous discussion of Figure 3 in the "Data Overview" section).

Interpretations

In general, the information I collected supports the use of most of my previously-discussed criteria as a method for discriminating early pithouse sites from later ones, and hopefully can aid in identifying seasonal sites. For convenience, I will reiterate the measurements I believe are useful:

- Construction Quality Index (based on posthole, house diameter, and house shape data)
- Interior Pits per House
- Percentage of Houses with Interior Hearths

I expect to correlate poor construction quality and a higher incidence of interior pits with seasonal sites, and that the presence of interior hearths can be used as an indicator of winter occupation.

Based on these criteria, are there any sites (in addition to the SU site) which seem to be seasonal? Four sites in my survey exhibit indications which seem to identify them as seasonal.

The Promontory site (Martin, Rinaldo and Antevs 1949) not only has a relatively higher number of interior pits, few interior hearths, and a poor construction quality index, it also happens to be contemporaneous to the SU site. Additionally, it is located in the Pine Lawn Valley, a short distance from the SU site. If the same criteria which indicate the SU site is seasonal are applied to Promontory, it must also be interpreted as a summer seasonal site.

A close look at the Bluff site data (Haury 1985) reveals a similar profile, and although the number of interior pits is much lower than those of the SU or Promontory sites, the near absence of interior hearths (when considered in combination with the site's high elevation) seems to rule out winter occupation.

Kent Lightfoot himself (1984) identifies the Duncan site as a seasonal camp occupied in the summer, and all three of my criteria support this interpretation to some degree.

The Winn Canyon site is particularly interesting. It it similar to the other presumed seasonal sites in terms of relatively poor construction quality, and Fitting (1973) identifies it as being contemporary to the SU site. Although the raw number of interior pits is not terribly high, a closer look is more compelling-- each house has at least one storage pit, and the pits are large and regular in shape. Additionally, many chipped and ground stone implements were discovered in some of the storage pits.

The Winn Canyon site distinguishes itself from the other previously-identified seasonal sites by featuring a hearth in nearly every habitation. It was on the basis of this difference, combined with its lower elevation (the Winn Canyon site, at 4610 feet, is almost 1800 feet lower than the SU site), that I originally identified the Winn Canyon Site as a possible winter seasonal site. While the temperatures were no doubt still quite chilly at this elevation, the winter weather would be much milder than that experienced *above* 6000 feet in the White Mountains.

Given these indicators of possible winter seasonal occupation, I examined the Winn Canyon site report (Fitting 1973) in more detail. The lithic assemblage contained a large number of projectile points (Fitting theorizes that the resident of one of the excavated houses was a master craftsman), hinting at hunting as a significant subsistence activity-- as one might expect during the winter.

Further attention to detail revealed striking similarities between the Winn Canyon and SU sites. Their geographical setting and community layout are quite similar-- residences occupy twin mesas separated by a saddle, and both sites have a possible Kiva at the tip of one mesa (Fitting 1973). In addition to this large-scale similarity, there are also many common architectural features.

In general, the early pithouses at both SU and Winn Canyon are circular, exhibit large, interior storage pits in the floors, and have generally East-facing lateral entries. All of the residential houses excavated at Winn Canyon can be described as a single type, and are quite similar to pit houses B, H, J, M, and T at the SU Site (Martin 1940, 1943; Martin and Rinaldo 1947). Specifically, in addition to the above-mentioned traits, these houses are similar in size, and have the same posthole pattern, i.e., one large central post.

I believe this data supports the interpretation of Winn Canyon as a seasonal site occupied during the winter. And even though there is not enough evidence to prove it, there is no reason to rule out the possibility that the Winn Canyon site may have been the winter home of the very people who occupied the SU site. The distance between the two sites (roughly 60 miles) is acceptable for a community practicing a seasonal round, the two villages are morphologically similar, and ceramics indicate they are contemporaneous and of the same culture.

Summary

1. Several published site reports from Mogollon pithouse villages allowed me to define a set of identifying characteristics which distinguish early pithouse sites from later ones.

2. I have developed a set of criteria which I believe can be used to identify early pithouse villages which are occupied for only part of the year (i.e., seasonal sites).

3. Using the aboved-mentioned set of criteria, I have proposed that the following sites were occupied for only the warmer part of the year: the SU site, the Promontory site, the Bluff site, and the Duncan site.

4. I have proposed that the Winn Canyon Site was seasonally occupied during the winter, and that there is no evidence to rule out interpreting the Winn Canyon site as the winter home of those people residing at the SU site in the summer.

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Appendix A

Individual Site Report Surveys