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UNSETTLING TIMES: THE GROWTH AND SUBSEQUENT DEPOPULATION OF THE ANCIENT SAN SIMON BASIN IN SOUTHEASTERN ARIZONA

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MARGARET A. DEW
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UNSETTLING TIMES: THE GROWTH AND SUBSEQUENT DEPOPULATION OF THE ANCIENT SAN SIMON BASIN IN SOUTHEASTERN ARIZONA

A THESIS APPROVED FOR THE
DEPARTMENT OF ANTHROPOLOGY

BY

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ABSTRACT

Growing population during the Pit Structure period in southeastern Arizona led to changes in economic strategies, settlement patterns, and social interaction. In the San Simon Basin, survey evidence shows a dramatic increase in the sizes of sites between the Late Archaic and Late Pit Structure periods as well as changes in site locations as people expanded into less optimal agricultural lands. The Pit Structure period is followed by a decline in population within the basin at the same time that large above-ground pueblos were being constructed just to the north along the Gila River. Site sizes were correspondingly smaller in the basin during the Surface Structure period and there is little evidence for subsequent occupation. The evidence for demographic change in the basin over time suggests that the impact of increasing population on economic strategies, and ultimately on the local environment, may have played a role in depopulation of the basin.

CHAPTER ONE

SETTLEMENT PATTERNS AND THE SAN SIMON BASIN

Major alterations in settlement patterns occurred in the San Simon Valley of southeastern Arizona between the Late Archaic period (1500 B.C. to A.D. 100) and the Surface Structure period (A.D. 1050 to 1150), denoting a time of demographic, economic, and social transition for the people of the region. Using survey data, this thesis will present evidence for developments that provided the impetus for these changes. Increases in site sizes and numbers during the Pit Structure period (A.D. 100 to 1050), combined with an increased density of sites along the drainages and the expansion of people into less well-watered areas over time, indicate population growth and a likely increase in sedentism and reliance on agriculture. A subsequent decrease in site sizes and numbers suggests movement of people out of the area following the Pit Structure period.

Previous research has shown that the San Simon Valley was occupied from at least the Middle Archaic (5000-2000 B.C.) through the Late Pit Structure period (A.D. 900-1050) (Bronitsky and Merritt 1986; Dooley et al. 1981; Gilman 1989, 1990, 1995, 1997; Huckell 1973; Kinkade 1986; LeBlanc 1989; Minnis and York 1993; Sayles 1945). Surveys have found few sites from the later Surface Structure period in the San Simon drainage, whereas there was an increase in large sites with above-ground pueblo architecture to the north, along the Gila River (Gilman 1997), indicating a change in land use between the Pit Structure and Surface Structure periods.

RESEARCH QUESTIONS

Population growth may have constrained traditional hunter-gatherer lifeways and reduced foraging territories, forcing people to settle on at least a part-time basis and increasingly rely on agriculture in order to sustain themselves. The questions to be considered in this research are whether settlement patterns suggest significant population expansion in the San Simon Basin as well as indications of the increasing importance of agriculture. Survey data from sites in the San Simon Basin provide information regarding changes in site sizes and locations through time which can shed light on these questions.

If population levels began to rise between the Late Archaic and the Pit Structure periods, there should be indications that settlements became larger and more numerous over time. If people also began to make more use of agriculture, site locations would be expected to change in relationship to water sources and arable land, with residential sites being increasingly located along major drainages where floodplain agriculture would be most productive. Conversely, if people remained residentially mobile with little dependence on agriculture, then site sizes and locations might not show a great deal of difference between Archaic and later periods. If primary streams and other well-watered areas, such as the San Simon River and the Whitlock Cienega, grew increasingly crowded over time, resulting in competition for prime agricultural lands, then people would likely have moved into smaller drainages and other less-desirable areas to live and farm as time went on. If, however, sites in these secondary locales remained small, they could represent short-term, seasonal logistical sites or camps where people procured non-agricultural resources including game, wild plants, and lithic materials. If environmental degradation of overpopulated areas in the basin occurred, this could have necessitated a move to more reliable water sources and larger tracts of arable land where irrigation is possible, such as may be found along the Gila River to the north. A sharp decrease in site sizes and numbers in the basin, concomitant with growth to the north, would reinforce the idea of abandonment of overused lands, although other factors, including climate change and social issues, may have played a part but will not be considered in this thesis.

REGIONAL POPULATION GROWTH

The interpretation of settlement patterns and land use within the San Simon drainage should not be considered in isolation from other areas in the Southwest. There is evidence within the region of connections to neighbors both to the east and west (Dobschuetz n.d.; Gilman 1997; Gruber n.d.; Smith 2005), as well as support for the idea that population densities were increasing in nearby areas as well. Reports of research in the Mogollon and Hohokam regions (Blake et al. 1986; Cordell 1997; Crown 1991; Fish 1989; LeBlanc 1989, 1999; Minnis 1985; Plog 1997; Stokes and Roth 1999), and specifically in the neighboring San Pedro Valley (Masse et al. 2002), indicate that population was growing in these areas during the same period. Additionally, studies of population change for the Southwest United States as a whole show a continual rise throughout the Pit Structure periods (Dean et al. 1994; Gumerman and Gell-Man 1994; Hill et al. 2004; Plog 1997).

An increase in population within the San Simon Valley would have been a part of a larger regional demographic trend that could have caused circumscription of local groups of people, limiting their choices regarding settlement strategies and use of the landscape. Such a population increase will be suggested by a dramatic increase in site size over the course of the Pit Structure period.

POPULATION GROWTH AND AGRICULTURE

In many areas of the North American Southwest, mobile Archaic period foragers gave way to increasingly settled agriculturalists. The timing and degree of this transition differed from area to area, and the relationship between sedentism and agriculture was not fixed (Plog 1997; Wills and Huckell 1994). Although there is evidence that corn and squash were being cultivated in the Southwest by 1500 to 1000 B.C. (Cordell 1997:124; Wills and Huckell 1994:33), it is likely that early agriculturalists in the Southwest remained partly mobile rather than settling year-round, and farming during the Late Archaic period may have been merely supplemental to a hunting and gathering lifestyle (Cordell 1997; Kelly 1992; Plog 1997; Wills and Huckell 1994).

Some archaeologists have seen the introduction of ceramics and pit structures as indicators of a change to sedentism and reliance on agriculture (LeBlanc 1982:40-41), while others have suggested that the change was less dramatic and much more gradual (Gilman 1995; Gilman et al. 1995; Plog 1997:56). There are several features and artifacts, as well as settlement pattern changes, which indicate that, in the San Simon region, the value of agriculture and degree of sedentism continued to increase from the Archaic through the Early, Middle, and Late Pit Structure periods. This trend ultimately culminated in the construction of large, above-ground pueblos to the north and in other areas of the Southwest, and people became even more sedentary while the practice of agriculture intensified (Gilman 1997; LeBlanc 1989; Plog 1997).

Early in this transition, population grew and people spread into new locales. It is likely that Archaic period population expanded to the point that competition for resources in arid regions such as the San Simon produced a need for new economic strategies, agriculture being a prime example. Once people began to settle and tend crops on at least a part-time basis, a decrease in mobility and a more reliable food source likely resulted in higher fertility (Plog 1997:65, 111), creating a cycle of escalating population and the need for intensified economic strategies.

Over time, prime agricultural lands would have experienced increasing site densities and areas adjacent to primary streams and cienegas would have become crowded. People eventually were forced to move into less desirable areas such as secondary drainages (LeBlanc 1989; Plog 1997:112).

The analysis of survey data presented in this thesis (Chapter Five) suggests that a dramatic population increase did occur between the Late Archaic and Late Pit Structure periods in the San Simon Basin with sites increasing along the main river drainage and then expanding into secondary drainages. While this analysis does not directly address the importance of agriculture for the people of the San Simon Basin, the presence of agricultural features and the changes in certain kinds of artifacts do attest to agricultural practice, and in some instances imply its increasing role. Analyses of a variety of artifacts from the San Simon Basin support the increased role of agriculture in people's lives and will be briefly discussed here. These artifacts include ceramics, flaked stone, ground stone, faunal remains, macrobotanical remains, architecture, and agricultural features.

Ceramics

The development of ceramic technology at the beginning of the Pit Structure period provided containers that were useful for both storing and cooking foods. The costs of pottery production were outweighed by its advantages for storage and cooking only as sedentism and dependence on cultigens increased (Crown and Wills 1995).

Previous researchers have noted the existence of a variety of ceramic styles within the San Simon region, including Hohokam, Mimbres, and local Mogollon wares (Bronitsky and Merritt 1986; Gilman 1997; Neuzil 2006b; Sayles 1945; Smith 2005). Smith's (2005) recent research has shown that the ceramic styles from varying traditions that are present in the San Simon drainage were likely locally produced. His analysis supports the idea that people migrated into the basin, bringing their technological traditions with them. The various ceramic styles do not in themselves provide evidence for population growth, but do suggest that people were migrating into the San Simon basin during the Pit Structure periods.

Flaked Stone

Nearly every site in the San Simon database contains some lithic debitage along with occasional stone tools such as projectile points. Stone tools in the San Simon basin have been analyzed in order to determine whether they reflect a relationship with agricultural dependence and decreased mobility. Bartlett and Gilman (1997:70) found that the choice of stone tool materials changed over time from the use of higher proportions of cryptocrystalline stone, suggesting hunting tools, to more use of crystalline stone, indicating more reliance on agriculture. In their analysis, hunting appears to have had more importance in the Archaic and again in the post-A.D. 1150 periods, while agricultural foods appear to have been increasingly used by people during the Pit Structure period and Surface Structure period.

Lail (1999) found similar evidence for increasing use of agriculture over time and suggests that more formal tools, necessary for hunting, gave way to more expedient tools related to farming. Both the raw materials and the forms of stone tools, then, suggest that people were increasingly reliant on agriculture as the Pit Structure period progressed. Lail further states that the flaked stone data infer that people were "hunting less large game, moving about the landscape less, and increasingly engaged in the processing of plant materials . . . " (Lail 1999:87).

Ground Stone

It has been suggested that an increase in size of some ground stone artifacts (manos and metates) are associated with increased dependence on agriculture (Diehl 1996; Hard 1990). Hard (1990) has noted an "intermediate" reliance on agriculture during the Pit Structure period in the San Simon area when compared with areas such as the Hohokam and Mimbres, but his analysis includes only ground stone from the Cave Creek site (Sayles 1945) south of the study area.

At Timber Draw, Frow and Schriever (n.d.) found an increase in the use of vesicular basalt over time, which may have been used in a two-stage grinding process. Williams et al. (1997) analyzed ground stone in three areas of the San Simon drainage and found several indicators of an increase in agriculture during the Pit Structure period. Their study showed a greater use of vesicular basalt for manos and metates and an increase in the amount of ground stone between the Archaic and Pit Structure periods, indicating an increase in food processing (Williams et al. 1997). The study also showed changes in the form and size of manos and metates with an increase in grinding area through the Pit Structure and Surface Structure periods, supporting the idea that more food was being processed. Despite these increases, agricultural dependence remains in the low range based on

Hard's (1990) index of mano length and agricultural dependence (Williams et al. 1997).

Survey reports used in this thesis contain information regarding the presence or absence of ground stone artifacts in sites. Some reports provide more detail than others, such as the presence of manos or metates, while others simply note that ground stone is present. Percentages of sites containing ground stone increased over time (see Chapter Five) suggesting increased use of tools for grinding plant foods.

Faunal Remains

In her study of faunal remains, Schmidt (2005) reported that Late Archaic and Pit Structure periods showed disproportionately high numbers of small taxa, mainly cottontail and jackrabbit, indicating a scarcity of large game from early in the occupational sequence of the San Simon Basin. Small game comprised nearly 95 percent of the assemblage at sites regardless of the time period they represented. This suggests that residents of the basin during the Archaic and Pit Structure periods used local resources with an "unequaled intensity" (Schmidt 2005:12) leading to substantial human impact on the environment. Her study of faunal remains lends support to the idea that the basin was overused, leading to its eventual abandonment after the Pit Structure period.

Macrobotanical Remains

There are few macrobotanical studies available from the San Simon Basin. There are, however, a small number of plant remains available from the Timber Draw site which reveal both wild and domesticated food sources and suggest an increase in the use of corn (maize) through time (Hurst et al. 1997).

Architecture

Pit structures themselves suggest a more settled existence when compared to temporary shelters used by mobile hunting and gathering societies. The labor involved in the construction of these dwellings indicates a certain degree of sedentism, even if of only a seasonal nature. In his study of Upland Mogollon pithouses, Diehl (1997) discovered that, over time, people invested more time and effort in pithouse construction. He linked this with intensity of site use and concluded that pithouse dwellers became increasingly sedentary and dependent on agriculture after A.D. 500.

Gilman (1987) has observed that people living in pit structures are usually only seasonally sedentary and rely on stored foods to get through the season of occupation. She further stated that the primary cause for a change from pit structures to above ground pueblos is "subsistence and its intensification" (Gilman 1987:556). This would seem to suggest that when the San Simon Basin was abandoned at the end of the Pit Structure period, people had by that time developed more dependence upon agriculture.

Agricultural Features

Recent research has described features of the landscape that suggest dry-farmed fields were in use in the Safford Valley, which includes the northern San Simon drainage, as early as 150 B.C. (Neely and Doolittle

2006). Rock features including linear borders, terraces, check dams, and rock piles, make up large agricultural fields near the Gila River. There is also evidence in the area of canal irrigation possibly as early as 190 B.C. Research has further suggested that dry-farming may have been a "common practice" here by A.D. 500 (Neely and Doolittle 2006:7). Rock piles, terraces, and linear rock alignments are also noted in survey reports from the study area used in this thesis (see Chapter Five).

SURVEY DATA AND GEOGRAPHIC INFORMATION SYSTEMS

The survey data (Appendix A) used for this study were collected from many different sources and represent the work of a number of individuals and organizations over a long period of time. The data contain information on site size, location, and elevation, as well as listing architecture, features, and artifacts present at sites that may further our understanding of economic strategies in the region. A database consisting of 571 sites was constructed using this information, and it was entered into a Geographic Information Systems (GIS) program. GIS facilitated locating sites in the San Simon Basin for settlement pattern analysis and allowed separation of sites by time period, location, and site size. Using this and other kinds of analyses, the previously outlined research questions are examined.

After 19 historic sites were removed, 552 prehistoric sites remained for the area. The study area for analysis in this thesis was further reduced to include only the San Simon Basin sites that occur to the south of the Gila River. Sites situated along the Gila River itself include many large, late pueblo villages which are not the focus of this study. Sites with missing information and multi-component sites that could not be divided into individual temporal sections were also removed, leaving 280 sites for comparative analysis (Figure 1.1).

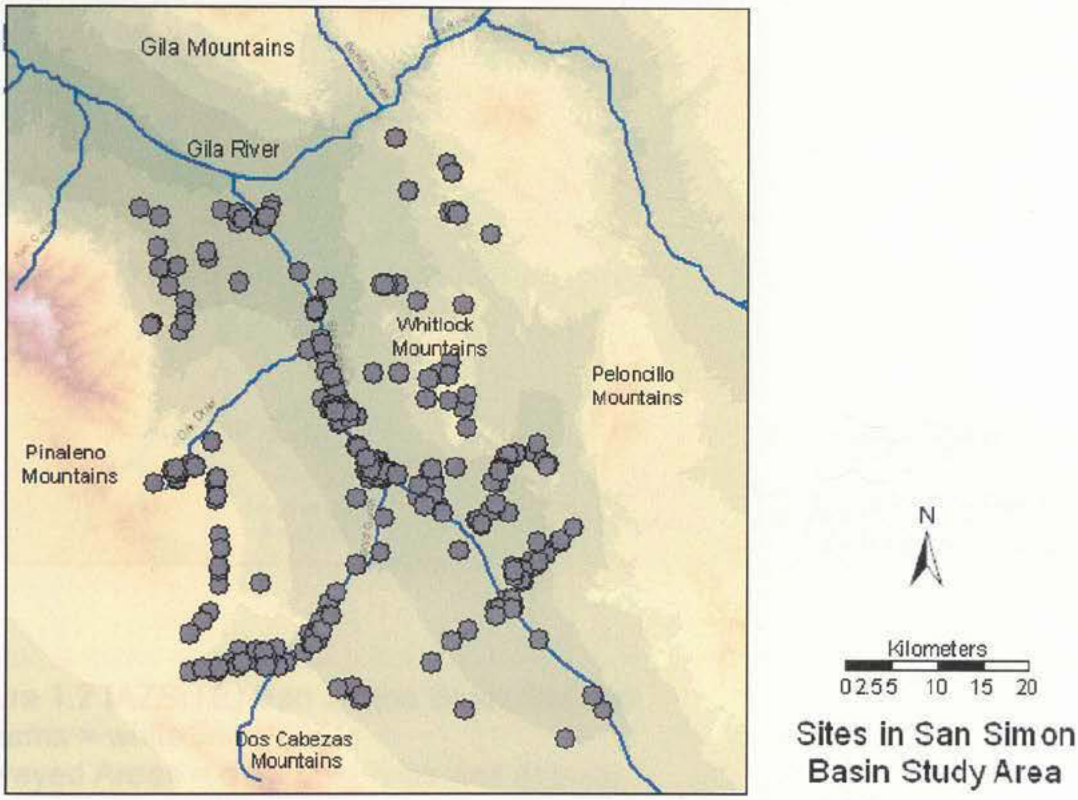


Figure 1.1 Sites Used for Analysis in the Study Area

It should be noted that only parts of the San Simon Basin have been surveyed (Figure 1.2). What appear to be linear groups of sites are often simply the result of linearly designed projects, such as surveys of highways, transmission lines, and pipelines. Dark lines on the map that appear to be highways are highway right-of-way survey projects. There have been some research-based surveys in the basin, but no systematic survey of the entire basin has been done.

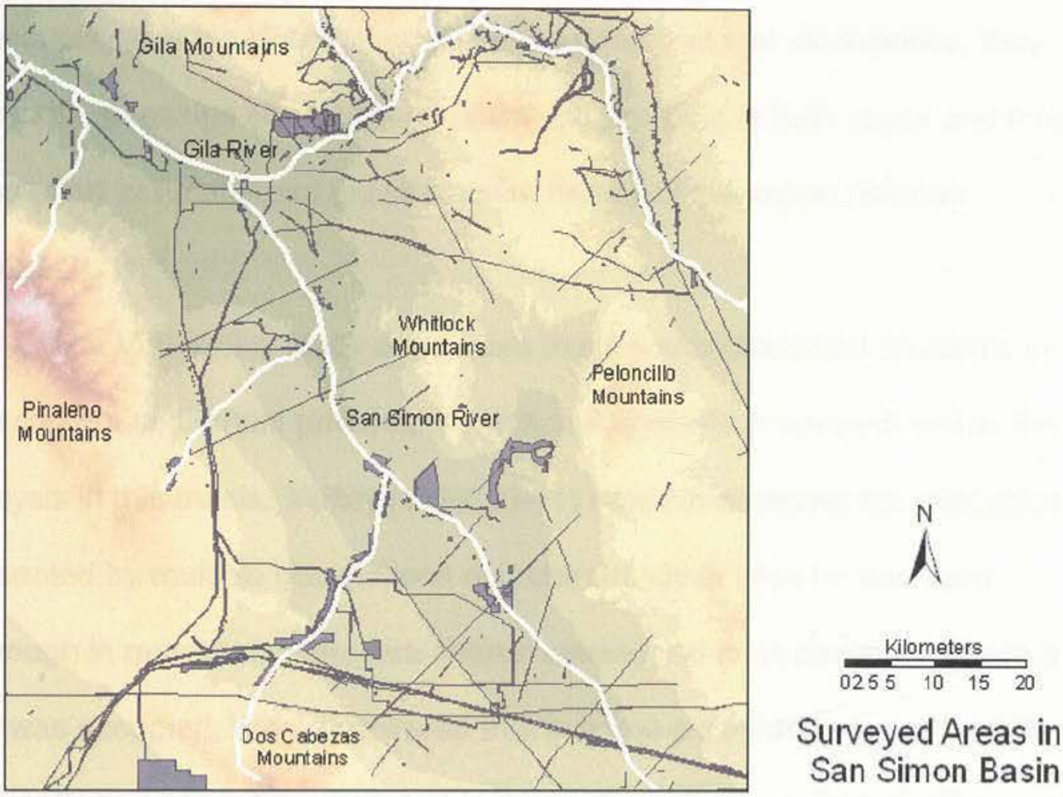


Figure 1.2 (AZSITE) San Simon Basin Surveys
Streams = white lines
Surveyed Areas = dark gray lines and spaces
No roadways are displayed, but survey corridors do outline highways.

SETTLEMENT PATTERN STUDIES

Settlement patterns are used to investigate regions or sub-regions rather than individual sites. The study of settlement patterns in archaeology was first outlined by Gordon R. Willey in his 1953 book, *Prehistoric Settlement Patterns in the Viru Valley, Peru* (Billman 1999:1; Trigger 1968:53). Willey (1999:10), however, credits Julian Steward with introducing him to the concept of settlement pattern study and encouraging his use of it. In 1946, using surface survey as part of a multi-disciplinary project, Willey and James Ford recorded 300 archaeological sites representing 5000 years of occupation in the Virú Valley. Aided by data from test excavations, they were able to assign site functions and to situate sites in both space and time in an effort to reconstruct the settlement history of the region (Billman 1999:1-2).

The Virú Valley study and others that followed identified problems in carrying out settlement pattern research, many of which are pertinent to the analysis in this thesis. Willey (1999:10-11) noted in particular the difficulties presented by multiple occupations and chronology at sites he surveyed. Although in many cases surface sherds correspond to all periods in which a site was occupied, Willy discovered that in some excavated sites, the earliest occupations were not represented in the surface sherds collected. The situation in the San Simon Valley with regard to multiple occupations will be addressed in Chapter Four.

Other issues identified by early settlement pattern studies included determining survey and surface collection methods, assigning site functions, and identifying post-depositional processes that may have affected remains at a site (Billman 1999:2). Test excavations of a sample of sites were found to be invaluable in addressing some of these concerns (Sanders 1999; Willey 1999), and it was further suggested that ethnographic studies of land use along with landscape and environmental reconstruction would be helpful in researching culture histories (Sanders 1999:21).

In a more recent study, Bettinger (1999) researched the origins of settled people in the Owens Valley of California by using available surveys from cultural resource management (CRM) and research projects rather than conducting his own systematic survey of such a vast area (60,000 km²). The data from the San Simon study area (approximately 3,000 km²) for this thesis were collected in a similar manner from survey reports as outlined in Chapter Four. Bettinger was aided by 62 excavations carried out by CRM and research projects, while this thesis has information from only a small number of excavations.

Information from survey reports in the San Simon Basin can be used to identify site locations, sizes, elevations, distribution of sites across a landscape, and the relationships of sites to each other and to a variety of resources. Using temporally sensitive data, settlement patterns can also show modifications in these aspects of sites through time, suggesting changes in the way people settled on and used the land. Each site in the study area represents some level of activity, whether as a small, short-term logistical site, a large village with many generations of occupation, or any type of land use in between these two extremes. The analysis of settlement patterns exhibited by these sites can provide insight into the activities and interactions of people who inhabited these places in the past (Chang 1972; Willey 1953).

Settlement pattern studies have more recently been incorporated into a holistic approach termed "landscape archaeology" (Anschuetz et al. 2001; Knapp and Ashmore 1999). Using this perspective, archaeologists and anthropologists recognize the dynamic interaction of people with their environments. This is in contrast to more one-sided views of the natural environment as either a passive background or a deterministic component of human culture and adaptation (Anschuetz et al. 2001; Ingold 1993; Knapp and Ashmore 1999). Landscape thus is not limited to the physical environment but rather represents the interactive aspect of the physical environment with human action and agency. Ingold (1993:152) describes the landscape as "a story" that tells of the people who moved around in it and helped to form it.

Archaeology is especially well-suited for studying the relationship between people and the natural environment because of its ability to view landscapes not only across space, but through time (Anschuetz et al. 2001). The data used in this thesis provide spatial distribution of sites across the landscape, while also allowing many sites to be viewed temporally. While site function is sometimes difficult to determine, inferences can nevertheless be made regarding changes in site size, population, and land usage over the long Pit Structure period in the San Simon Valley.

THESIS ORGANIZATION

Chapter Two of this thesis provides background information regarding the natural setting of the San Simon Basin, including its topography, flora and fauna, geology, climate, and changes in the area's environmental condition in order to gain an understanding of the landscape and resources available to people who inhabited the valley. The presence of a variety of resources assists in explaining why people might have chosen to settle in this area. The decisions that people made in relationship to their use of the land are manifested in part by the analysis of settlement patterns in this research.

The cultural background and occupational chronology of the San Simon Valley and southeastern Arizona are outlined in Chapter Three, and a summary of previous archaeological work in the region is presented. This account of research done in the San Simon should not be viewed as complete, but rather as a work in progress, since much archaeological work remains to be done both within the San Simon drainage and in nearby areas, with the goal of better understanding the lifeways and experiences of the basin's previous occupants.

Construction of the database for this thesis is detailed in Chapter Four, including the kinds of data chosen for analysis and the sources from which this information was gathered. Research methodology, consisting of the methods for determining temporal designation of sites, the use of a GIS program, and analysis of site size and site distribution are explained. Sites are assigned to temporal periods and separate databases are constructed for each.

In Chapter Five, a site size analysis is performed for each dataset, and comparisons and changes in site sizes through time are examined.

Using the mapping capabilities of the GIS program, site locations are also analyzed for each time period and the changes in settings that people chose for sites are explored.

Implications of site size and site location analyses are presented in Chapter Six. A case is then made in support of increasing population and sedentism, with greater dependence on agriculture, over the course of the Pit Structure period. Settlement pattern analysis and other kinds of studies provide support for changing economic strategies, possible environmental degradation, and subsequent depopulation of the San Simon Basin corresponding with the presence of large aggregated settlements with above-ground architecture along the Gila River to the north of the study area. Influences that may have contributed to these changes are proposed and suggestions for future research are summarized.

SUMMARY

Major changes in settlement patterns occurred between the Archaic and Surface Structure periods within the San Simon Basin. This thesis will use survey data to address the research questions presented in this chapter suggesting population growth with an increase in sedentism and agriculture, and subsequent abandonment of the San Simon Basin. This analysis will contribute to a better understanding of the interaction between people and their natural environment, not only in the basin itself, but in the greater Southwest region of which it is a part.

CHAPTER TWO

NATURAL ENVIRONMENT

The natural environment is an essential feature of settlement pattern or landscape studies. The placement of sites across a landscape, and the ways that people interact with the land, are strongly influenced by the natural surroundings and the resources they provide. Site locations may be chosen for a variety of reasons, including proximity to critical resources, increased safety and security, optimal adaptation to climate and seasonality, or perhaps for aesthetic, social, or ideological motivations. Site locations reflect the decisions that people made, and in the San Simon region these locations have the potential to inform us about the choices they made during times of significant change, possibly from mobile to more settled ways of life with increasing population and a greater dependence on agriculture.

In this chapter, I discuss the natural environment of the San Simon Basin and the variety of resources it offered to people who settled there in order to facilitate an understanding of the relationship between people in the basin, their environment, and the changing patterns of settlement that resulted over time. People simultaneously shaped and were shaped by the landscape they inhabited, and this chapter will delineate some of the components of that landscape.

TOPOGRAPHY

The arid San Simon Valley is located in far southeastern Arizona near the border with New Mexico in the desert Basin and Range province (Figure

2.1). The San Simon River flows in a northwesterly direction through this alluvial desert basin before joining the Gila River near Safford, Arizona. The river is now dry most of the year and only runs during seasonal rains, although in the past it is thought that surface water was more abundant in the area, providing a lush riparian environment (Bronitsky and Merritt 1986:33; Gilman 1997:36). The lower San Simon Valley lies between the Pinaleño Mountains on the west and the Peloncillo Mountains on the east, and it is further bracketed by the Dos Cabezas Mountains on the south and the Gila Mountains on the north (Figure 2.1).

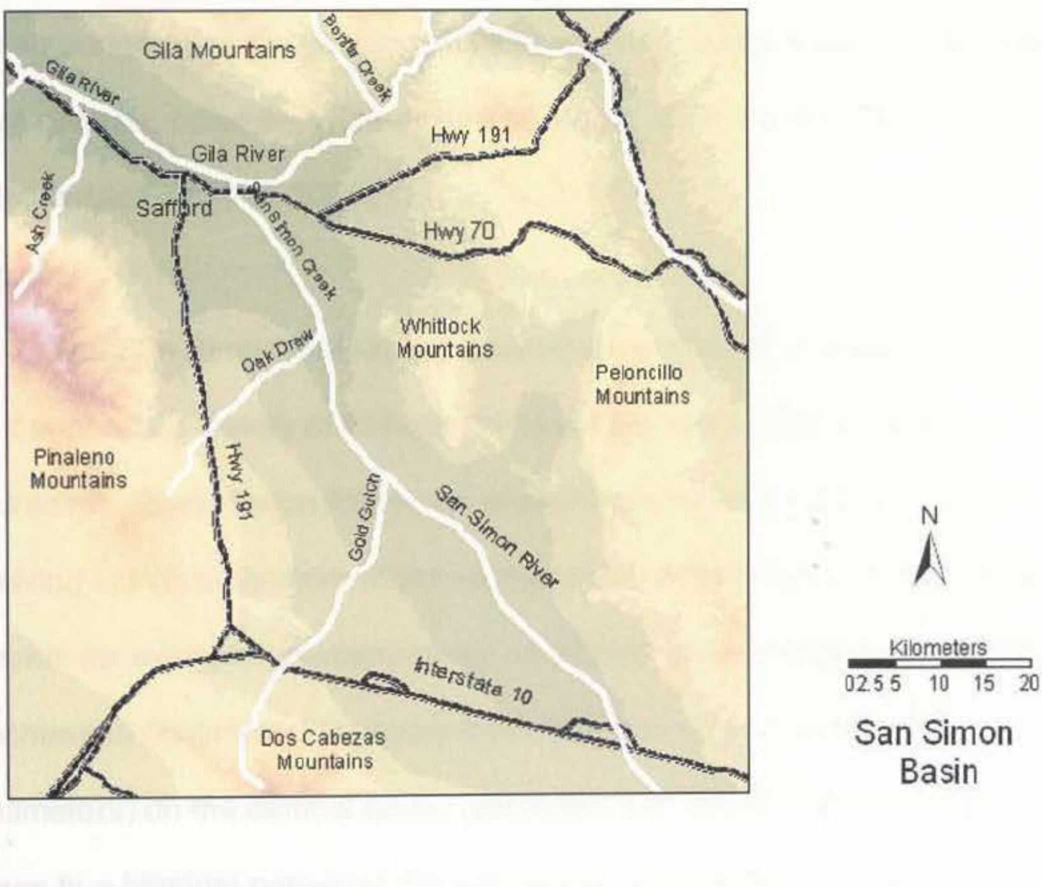


Figure 2.1 Map of the San Simon Basin

Although it is near the eastern border of the Sonoran desert to the west, the San Simon region is part of the northern Chihuahuan desert because of its relatively higher elevations, ranging from 3000 feet (914 meters) on the valley floor to above 10,000 feet (3000 meters) in nearby mountains (Bronitsky and Merritt 1986; Brown 1982; Gilman 1997). This juxtaposition of the desert basin with mountain ranges in the San Simon area creates what Huckell and Toll (2004:78) have described as an area of "compact vertical zonation" wherein many biotic communities exist at different elevations within a reasonably short distance. As elevation increases, there is an increase in precipitation, a decrease in temperature, and a shortening of the growing season. A variety of flora and fauna inhabit these different ecozones (Bronitsky and Merritt 1986; Brown 1982; Ebeling 1986; Huckell and Toll 2004).

Climate

The San Simon drainage is located in a region of Chihuahuan desert, but it supports a variety of climates between the lower basin and the mountains. Precipitation follows an elevational gradient, with mountains receiving significantly more moisture than the lower deserts. In southeastern Arizona, for example, average annual precipitation can range from as little as 7 inches (18 centimeters) in some lower elevations to 35 inches (89 centimeters) on the highest peaks (Bronitsky and Merritt 1986:17). Rainfall occurs in a bimodal pattern in the San Simon area, with more than half of annual precipitation occurring during the summer, when evapotranspiration is high, thereby lessening its overall effectiveness. The summer monsoon brings thunderstorms that often cause flash flooding while the winter rainy period brings gentle rain, which can soak the soil before spring growth. Precipitation is quite variable both seasonally and annually and even from valley to valley (Bronitsky and Merritt 1986; Brown 1982; Minnis 2004).

Temperatures in the area vary from warm to hot in summer, except in higher elevations, to somewhat cold in winter. Summer temperatures may reach 40° C (104° F) while freezing temperatures can be experienced during winters (Brown 1982). Elevation affects temperature, resulting in relatively cooler temperatures at higher elevations and warmer temperatures as elevation decreases. Daily temperature ranges can vary as much as 30 to 50° F (Bronitsky and Merritt 1986).

Because of its relationship to temperature, elevation also affects the length of growing season, or the number of frost-free days. The relatively higher Chihuahuan desert would thus have slightly fewer frost-free days than the lower Sonoran desert to the west. As an example, Willcox, Arizona, in the Chihuahuan desert near the southwest margin of the San Simon study area, is situated at 4200 feet (1280 meters) and has a growing season of only 200 frost-free days, whereas Tucson, Arizona, in the Sonoran desert roughly 60 miles to the west, lies at an altitude of 2500 feet (762 meters) and has an average of 250 frost-free days per year (Bronitsky and Merritt 1986).

The availability of moisture, in the form of rainfall and groundwater, would have been a limiting factor in the ability of people to grow crops in the

San Simon valley and to settle at least part-time in villages, as we know they did. Temperature, specifically with regard to length of growing season, would also impact their ability to successfully engage in agriculture. Moreover, the climate would have to have been favorable enough to support an ecosystem contributing a variety of floral and faunal resources to the population.

Floral Resources

Chihuahuan desert vegetation is found in the alluvial river basin, which is the lowest ecozone within the San Simon drainage. The basin elevation ranges from 3000 feet (914 meters) to around 4000 feet (1219 meters), which includes the lower bajada slopes. Temperatures are warmer at this elevation, and there is less rainfall compared to the surrounding uplands and mountains.

The river basin contains mostly Chihuahuan desert vegetation with some riparian plants near drainages and cienegas. The dominant plant here is creosote bush (*Larrea tridentata*), but there is also tarbush (*Flourensia cernua*), four-wing saltbush (*Atriplex canescens*), mesquite (*Prosopis glandulosa*), snakeweed (*Gutierrezia sarothrae*), burrobush (*Hymenoclea salsola*), acacia (*Acacia neovernicosa*), tamarisk (*Tamarix chinensis*), which is non-native, and a number of desert flowers and cacti, such as ocotillo (*Fouquieria spendens*), cholla and prickly pear (*Opuntia* spp.) (Brown 1982; Ebeling 1986). Many wild plants from the basin have edible parts and were likely used for food, including weedy annuals, mesquite pods, and cactus fruits, which may have supplemented cultivated crops such as maize (Cordell

1997:45; Huckell and Toll 2004:69). Acacia and mesquite were frequently used in construction (Huckell and Toll 2004:69) and would have been useful as firewood as well. Mesquite beans, pods, roots, bark, and leaves have been used as medicines and foods (USDA 2006).

Further upslope, in the upper bajada and foothill areas between 4000 and 5000 feet (1219 and 1524 meters), a variety of plants not seen in the basin can be found, including agaves (*Agave* spp.), yuccas (*Yucca* spp.), and several large woody shrubs and cacti, coldenia, catclaw (*Acacia greggii*), and other plants of the succulent-scrub type. Agave and yucca were particularly important sources of food and may have been cultivated (Huckell and Toll 2004: 77). Their fibers were also useful in making baskets, sandals, and cordage (Cordell 1997:46; Ebeling 1986). At the upper reaches of the desert foothills, the vegetation grades into semi-desert grasslands, where occasional juniper (*Juniperus monosperma*) and chaparral species (shrubby plants) can be found (Brown 1982; Gilman 1997). Grass seeds and juniper berries are among the many plants used by native peoples as food, and juniper wood also has many uses as a construction material and for firewood (USDA 2006).

Finally, there are the mountains themselves, with Mount Graham in the Pinaleño Mountains being the highest at 10,700 feet (3261 meters), where chaparral, pine, oak, and fir trees can be found. Ponderosa pine (*Pinus ponderosa*) and other trees can be sources of medicine, building material, firewood, and food. For example, the seeds, bark, cones, and pitch of ponderosa have all been used by native peoples for food (USDA 2006).

Other biotic zones exist within the valley, such as the riparian areas along the San Simon River, which include vegetation such as cottonwood and willow, and the Whitlock Cienega (marsh) in the Parks Lake area (a dry Pleistocene lakebed), which made wetland resources available in the past. Wetlands contain a huge variety of plants including weedy annuals, grasses, herbs, and berries, many of which are used as foods and medicines (Ebeling 1986; USDA 2006). The combined ecozones found in the San Simon area are home to more than 1000 species of plants, many of which could provide seasonal foods, such as seeds, nuts, fruits, greens, and cereals (Brown 1982; Ebeling 1986; Gilman 1997).

Faunal Resources

The diverse biotic zones of the San Simon region are also home to an assortment of animals. Common small mammals that are present in the basin include cottontails (*Sylvilagus* spp.), jackrabbits (*Lepus* spp.), ground squirrels (*Spermophilus* spp.), kangaroo rats (*Dipodomys* spp.), and mice. Grasslands are home to these and other species including pronghorn antelope (*Antilocapra* spp.). At the higher elevations are found large mammals including mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), and bighorn sheep (*Ovis canadensis*). Other species found in the varied zones of the San Simon include a number of reptiles and birds, and predators such as bobcat, jaguar, and cougar (*Felis* spp.); fox, wolf, and coyote (*Canis* spp.); bear (*Ursus* spp.), coatis (*Nasua* spp.), raccoons (*Procyon* spp.), badgers (*Taxidea* spp.), and weasels (*Mustela* spp.) (Brown 1982; Dooley et al. 1981; Ebeling 1986; Myers et al. 2006; Schmidt 1998).

These animals and others have been hunted for their meat, hides, fur, bone, and antlers, and they would have been important resources for people living in the basin. If, as mentioned previously, the area was more well-watered in the past (Bronitsky and Merritt1986:33; Gilman 1997:36), the lusher environment would have provided more habitat for these animals, which in turn would have served as game for the people who lived there.

Geology

Besides supplying food resources, the mountain ranges surrounding the San Simon drainage also contribute a variety of raw materials that can be used in the manufacture of both flaked stone and ground stone artifacts. These artifacts include tools used in hunting, agriculture, food processing, and other activities of daily life. Different types of stone are associated with each particular mountain range, but many of these materials are found in the gravels and cobbles of the alluvial river basin and its tributary washes, as well as in the mountains themselves (Gilman 1997).

The Pinaleño and Dos Cabezas Mountains to the west and south of the valley are composed of granites, gneisses, and schists of Precambrian age, while the younger Whitlock and Peloncillo ranges to the east are composed mainly of Cenozoic basalts, andesites, and rhyolites (Cooley et al. 1967; Kamilli and Richard 1998). To the south, the Dos Cabezas are composed of mostly schist, gneiss, and granite with some more recent igneous intrusions, while further south the Chiricahua Mountains are made of andesite, rhyolites, latite, and dacite flows along with a few sedimentary materials such as limestone. There are intermittent deposits of quartzites along the eastern edge of the Chiricahuas as well (Cooley et al. 1967). Over time, erosion of the mountains deposited these materials in the valley where they became a valuable resource for the early inhabitants (Dooley et al. 1981). The breakdown of these different rock types, and their deposition in the valley, also provided clays and sands used in ceramic production (Smith 2005), as well as creating the soils necessary for agriculture.

The archaeological sites recorded for this thesis contain evidence of these different raw materials and the tools and other artifacts that were fashioned from them. The people who lived here had an intimate knowledge of the varied resources available to them and the expertise to transform them into items that were used in their daily lives.

Soils

Alluvial soils in the San Simon Basin reflect the various rock types present in the mountain ranges surrounding the basin. Coarser materials from parent rocks are found on alluvial fans and terraces, while finer sediments from mixed sources are located within the floodplain (Balchin and Pye 1954). Floodplain soils include loams and silty clay loams of the Glendale-Gila complex. Outside of the floodplain, alluvial fans and terraces are formed from loams, sandy loams, and clays of the Gila-Anthony

Bluepoint complex, Anthony-Gila complex, and Tres Hermanos gravelly loam (Vogt 1980).

Successful agriculture is dependent in large part on the soils in which crops are grown. Some of the soils in the San Simon form cobble covered terraces where rock-bordered fields have been reported. The rock helps to retain runoff and increases soil moisture, trapping sediment and controlling erosion (Homburg, et al. 2004:62). In the Safford Valley at the northern end of the study area, soil testing showed that nutrient levels could support maize agriculture within these rock-bordered grids. However, the high temperatures and low rainfall of the area would probably have better supported more drought resistant crops such as agave (Homburg et al. 2004:78). As noted in Chapter One, both dry farming and irrigation may have been practiced in the floodplain of the Safford Valley by 190 B.C. (Neely and Doolittle 2006:7).

Changing Environmental Conditions

Environmental conditions in the San Simon Basin today are not likely to be representative of prehistoric or even early historic conditions. Vegetation in the region has undergone considerable change over the last century, with a decline in grasslands and an increase in woody and shrubby plants, such as mesquite and acacia (Bahre and Shelton 1993). Non-native plants, such as tamarisk (*Tamarix chinensis*), Russian olive (*Elaeagnus angustifolia*) and Russian thistle (*Salsola kali*), have invaded many areas of the river, replacing native riparian species such as cottonwood and willow.

Both climatic fluctuation and anthropogenic impact have been suggested as possible causes for vegetation change, with the most compelling arguments putting a large part of the responsibility on the side of historic human actions, while not entirely ruling out some climatic effect (Bahre and Shelton 1993). Among the activities suggested as contributors to the alteration of plant distributions are livestock overgrazing, fire suppression, excessive tree-cutting in watersheds, groundwater pumping, land clearing for agriculture, and construction of roads, railroads, pipelines, and dams (Adams 2004; Bahre and Shelton 1993; Bronitsky and Merritt 1986; Gilman 1997; Minnis 2004).

These practices have resulted in increasing desertification as well as downcutting of rivers and arroyos. Water is a critical resource in arid environments, and ephemeral drainages and dry arroyos have taken the place of perennial surface streams, springs, and marshes (Bronitsky and Merritt 1986; Minnis 2004). The San Simon River itself is now an intermittent and entrenched stream, where a broad and meandering surface stream once flowed (Bronitsky and Merritt 1986). The basin environment was thus comparatively richer during periods of prehistoric occupation.

SUMMARY

The natural environment of any area is a limiting factor to the economic success of a people and to their ability to occupy settlements through time. There is evidence that people did successfully settle, maintaining a presence in the San Simon Valley over an extended period of time and building large pit structure villages. The valley apparently provided the necessary floral and faunal resources, water, raw materials, and favorable climate to allow at least a semi-sedentary lifestyle.

CHAPTER THREE

PREVIOUS ARCHAEOLOGY AND CHRONOLOGY

PREVIOUS ARCHAEOLOGY IN THE SAN SIMON BASIN

The San Simon Valley is located between the Hohokam cultural area in the Tucson Basin to the west and the Mogollon cultural region in the Mimbres Valley to the east. The San Simon area has received much less attention in the form of archaeological investigation than have the Hohokam, Mogollon, and other areas of the Southwest (Gilman 1997; LeBlanc 1989; Neuzil 2006).

Sayles (1945) defined the San Simon Branch as a distinct variant of the Mogollon culture when he excavated two pit structure village sites in the area, Cave Creek and San Simon Village. Excavations at Cave Creek, located along the eastern side of the Chiricahua Mountains in the southern end of the basin, yielded seven pit structures. Plain and red ware ceramics indicating an early pit structure occupation were overlain by ceramics from later pit structure periods that included Encinas Red-on-brown, Mimbres Classic Black-on-white, Mogollon Red-on-brown, Three Circle Red-on-white and both Gila and St. Johns Polychromes (Sayles 1945).

At San Simon Village, near the southern end of the study area, Sayles directed excavations of 54 of 66 identified pit structures and recorded the presence of painted ceramics indicating design influences from both Hohokam and Mogollon sources along with locally-made red-on-brown wares. Based on the presence of these local wares, Sayles (1945) identified the San Simon Branch as Mogollon influenced, but with its own distinct tradition.

Some archaeological survey was undertaken as early as the 1920s and 1930s (Sauer and Brand 1930), but it focused mostly on large pueblo sites that occur to the north of the San Simon Valley along the Gila River. Although relatively little archaeological investigation occurred in the valley in early years, work has increased in the San Simon and adjacent areas since the late 1970s as a result of new surveys.

Among the newer surveys are those carried out as part of the San Simon Restoration Project conducted by the Bureau of Land Management (BLM) (Kinkade 1986). These BLM surveys were carried out in preparation for building dams to reduce erosion. The Timber Draw Survey (Dooley et al. 1981) recorded 35 sites; three of those were later excavated (Gilman 1997; Gilman and Schriever n.d.).

During the 1980s and 1990s, the San Simon Archaeological Project (SSAP) surveyed parts of the drainage, including along Gold Gulch, Railroad Wash, and Oak Draw, and the San Simon River itself and carried out both survey and some excavation at Timber Draw on the San Simon, Whitlock Cienega, and Hot Well Dunes (Gilman 1997; Gilman et al 1995; Minnis and York 1993). A number of cultural resource management (CRM) projects, including the AEPCO Project (Simpson et al. 1978; Westfall et al. 1979), the All American Pipeline Project (1989), the AT&T Nexgen/Core Project (Kearns et al. 2001), the Department of Transportation (various dates), the MCI Fiber

Optic Cable Project (Bruder et al. 1990), and others have also been carried out by both government and contract agencies in conjunction with construction activities, such as pipelines, transmission lines, seismic lines, highways, and dams.

These survey and excavation projects have provided archaeological evidence in the form of sites containing pit structures, surface structures, features, and artifact scatters, all of which indicate the presence of people who used this land in the past, beginning at least as early as Archaic times and continuing through Pit Structure, Surface Structure, and Post-A.D. 1150 periods (Table 2.1). The main occupation of the area appears to have occurred during Late Archaic and Pit Structure periods, roughly 1500 B.C. through A.D. 1050 (Gilman 1997).

CHRONOLOGY OF THE SAN SIMON BASIN

Because relatively little research has focused on the San Simon region in comparison to other areas of the Southwest (Gilman 1997:11; LeBlanc 1989; Neuzil 2006a), the chronology is less well known than that of nearby areas, including the Hohokam to the west and the Mimbres Mogollon to the east. Temporal division is further hampered by the fact that the arid desert environment does not lend itself to the use of the kind of woods that would provide dendrochronological dates (Gilman 1997:15). Archaeological time period designations for the San Simon drainage are shown in Table 2.1. The assignment of time periods is based on ceramic seriation, projectile point types, architecture, and in a few cases, chronometric dating techniques.

Paleoindian	10,000 - 8000 B.C.
Early Archaic	8000 - 5000 B.C.
Middle Archaic	5000 - 2000 B.C.
Late Archaic	1500 B.C. – A.D. 100
Early Pit Structure	A.D. 100 - 650
Middle Pit Structure	A.D. 650 – 900
Late Pit Structure	A.D. 900 - 1050
Surface Structure	A.D. 1050 – 1150
Post-A.D. 1150	A.D. 1150 - 1450

Table 3.1 San Simon Chronology (Gilman 1997:31)

Paleoindian Period (10,000 to 8000 B.C.)

The earliest evidence of human presence in southeastern Arizona is found in Paleoindian sites that have been reported in nearby areas although none to date have been recorded in the San Simon Valley itself. Only two or three Paleoindian projectile points have thus far been recovered from the San Simon area (Gilman personal communication, 2005). Due to the antiquity of Paleoindian remains, they are likely to be covered by later deposits and would be difficult to locate unless exposed by erosional forces (Cordell 1997:72). Since Paleoindian presence is outside the scope of this analysis, it will not be further addressed in this thesis.

Archaic Period (8000 B.C. to A.D. 100)

As with the Paleoindian period, there is little evidence for Early Archaic (8000 to 5000 B.C.) presence in the San Simon. While Middle Archaic period (5000 to 2000 B.C.) sites occur in small numbers and are generally identified by the presence of one or two Middle Archaic projectile points, Late Archaic (1500 B.C. to A.D. 100) sites are more common in the area, giving evidence for increasing use of the San Simon by later Archaic peoples (Gilman 1997:16, 31). This is supported by evidence that a change from a drier to a wetter climate in the valleys of southern Arizona occurred around 2000 B.C., precipitating an increase in human occupation of these areas (Cordell 1997:117).

During the long Archaic period, people hunted modern game animals and increasingly depended on plant foods. Although still a hunting and gathering people, by the Late Archaic they were cultivating crops, such as maize, that had been domesticated earlier in Mesoamerica (Cordell 1997; Wills and Huckell 1994), and the period is sometimes referred to as the Early Agricultural period (Huckell and Toll 2004:50). Although some shallow pithouses were constructed late in the Archaic, there is little evidence of even seasonally sedentary settlements during this period in most parts of the Southwest (Cordell 1997:221).

Pit Structure Period (A.D. 100 to 1050)

Gilman (1987, 1995, 1997) has suggested that the transition from the Late Archaic to the Early Pit Structure period was a gradual one, and that the introduction of ceramics and pit structures, while bringing about some changes, did not necessarily signal a dramatic shift to a settled lifestyle with a dependence on agriculture. Rather, changes in agricultural and residential mobility appear to have occurred at a measured pace both during and after the Pit Structure period (Gilman et al. 1995:84).

Early Pit Structure Period (A.D. 100 to 650). This period marks a change in adaptation as people begin to live in pit structure villages and to make pottery. The earliest appearance of ceramics is used to identify Early Pit Structure period sites on survey, which are indicated by the presence of plain brown ware sherds (introduced between A.D. 100-400 in the San Simon) and slightly later red ware sherds (introduced between A.D. 400-650) (Gilman 1997:16). The presence of pit structure architecture is another indicator of this period, although the semi-subterranean nature of pit structures renders them mostly imperceptible to surveyors. Near the end of this period, village sites began to appear (Gilman 1997).

Middle Pit Structure Period (A.D. 650 to 900). This period is characterized by the addition of the first painted wares including Dos Cabezas Red-on-brown, Galiuro/Pinaleño Red-on-brown, Boldface Black-on-white, Transitional Black-on-white, Gila Butte Red-on-buff, Santa Cruz Red-on-buff, and an unidentified red-on-white ceramic (Gilman 1997:20-22). These painted wares exhibit styles seen both in the Hohokam area to the west and the Mimbres area in the east, as well as local wares. Pithouse villages continued to grow during this and the following period.

Late Pit Structure Period (A.D. 900 to 1050). There is a higher proportion of painted pottery during this period with the addition of Encinas Red-on-brown, Sacaton Red-on-buff, and Classic Mimbres Black-on-white, which appears late in this period (Gilman 1997:20-22). Because ceramics from both Middle and Late Pit Structure periods are often found in the same sites, the analysis in this thesis will combine these two periods (see Chapter Four).

Surface Structure Period (A.D. 1050 – 1150).

The Surface Structure period marks a shift in settlement pattern in the basin. The period begins with a change in architecture from pit structures to surface structures. Fewer sites are present in the valley, and they are identified by the presence of one-room structures outlined by a single course of upright cobbles. Although more than one room may be present, they are not often contiguous in San Simon sites during this time period (Gilman 1997:28), although contiguous rooms do appear further north along the Gila River and it is likely that people from the San Simon Basin were relocating there. The one-room structures in the basin may represent field houses rather than residential structures. Changes in ceramics also occur at this time when Cibola white wares are added and corrugated ceramics increase in frequency, as does the proportion of Classic Mimbres Black-on-white (Gilman 1997:28).

Post-A.D. 1150 Period (A.D. 1150 – 1450)

Few sites are identified for the Post-A.D. 1150 period in the San Simon, and their assignment to this period is based on the presence of a wide array of new ceramic types, including Chupadero Black-on-white, White Mountain red wares, San Carlos Red-on-brown, Playas Red Incised, Gila Polychrome, Tonto Polychrome, St. Johns Polychrome, Maverick Mountain Black-on-red and Polychrome, and Tularosa Black-on-white (Gilman 1997:30-31). The dearth of sites in the basin at this time corresponds with the presence of large pueblos along the Gila River to the north where there was favorable land for irrigation agriculture. Although Post-A.D. 1150 sites will be discussed, there are not enough of them in the study area to include in the analysis.

SUMMARY

This chapter gives a brief overview of some of the archaeological work that has been done in the San Simon region. The surveys and excavations listed have helped to establish the regional chronology outlined above. Sites used in the analyses in Chapter Five have been divided into time periods, and each time period is briefly described in this chapter. The ability to separate sites into the temporal periods listed here is critical to the settlement pattern analysis in this thesis.

CHAPTER FOUR

DATA AND RESEARCH METHODS

In order to examine changes in settlement patterns over time in the San Simon Basin, it is necessary to determine where archaeological sites are situated and what time periods they represent. The mapping of these attributes allows visualization of the ways people made use of the landscape and the ways land use changed during different time periods. Variation in where sites were located over time can suggest changes in adaptation as agricultural use increased and hint at stressors such as overcrowding of prime agricultural lands.

Additional kinds of information, such as site size, site type, and the kinds of artifacts and/or architecture present contribute to the analysis. Changes in site size, for example, can illustrate the growth of villages over time in the region and suggest increasing sedentism, while site types can inform regarding the kinds of activities that were carried out in different locations. Ceramic artifacts are used as temporal indicators so that changes over time can be demonstrated. Artifacts can provide a variety of details to suggest past activities. For example, an increase in the amount and size of ground stone artifacts or a change in flaked stone materials over time may infer greater reliance on agriculture.

DATA COLLECTION

Boundaries for the actual study area were established in order to focus on settlement patterns in the basin itself, and not on those along the

Gila River in the northern end of the basin where later pueblos flourished. Sites north and east of Safford and within approximately a mile south of the Gila River, were excluded. Other boundaries include the Pinaleño peaks to the west, the foothills of the Dos Cabezas Mountains to the south, and a line paralleling the San Simon River just to the east of the Whitlock Mountains, including a handful of sites along the foothills of the Peloncillo Mountains. See Figure 1.1 (page 12) for sites encompassed by the study area.

The compilation of the initial database (Appendix A) for this study consisted of collecting 571 archaeological sites in the northern San Simon River drainage as previously described (Chapter Two). These are all the sites for which I was able to obtain records using a variety of sources, including survey data from AZSITE (Arizona's Cultural Resource Inventory), the San Simon Archaeological Project, Bureau of Land Management, United States Forest Service, and several cultural resource management projects listed below, some of which were also on the AZSITE database. Most of the information not located on AZSITE was obtained from files in the possession of Dr. Patricia Gilman, University of Oklahoma. A limited number of excavations also contributed information for this database, including the Timber Draw excavations (Dooley et al. 1981; Schriever and Gilman n.d.), the Hot Well Dunes Archaeological Project (Minnis and York 1993), and the Cave Creek and San Simon Village excavations (Sayles 1945).

Nineteen of the sites in the original database were found to be Historic period and were removed, leaving 552 sites. There were 121 sites outside the study area margins, as described above, and these were excluded from the analysis. Another 61 sites were eliminated because they had no site size listed in the survey records, while nine sites had no UTM coordinates and were thus not useful for site size analysis. Eighty-one sites were excluded because they could not be separated by time period, usually due to missing data, such as artifact information, leaving 280 sites for the final comparative analyses.

The types of information used in constructing the database (Appendix A) are listed below. Not all types of data were used in the analyses for this thesis but were included in order to make as complete an accounting as possible of what was present at each site.

- Site number sources – and identifying acronyms
  - Arizona State Museum (ASM)
  - Bureau of Land Management (BLM)
  - United States Forest Service (FS) or (AR)
  - San Simon Archaeological Project (SSAP or SS)
  - Advanced Engineering Planning Corporation (AEPCO)
  - All American Pipeline Company (AAP)
  - Arizona Department of Transportation (ADOT)
  - Timber Draw Project (TD)
  - Tanque Project (TQ)
  - Arizona State Land
  - Amerind Foundation

- SWCA Environmental Consultants
- Anaconda Mining Company
- Petty-Ray Geophysical
- GSA Resources, Incorporated
- Union Carbide Corporation

- Location – Universal Transverse Mercator (UTM) and/or Township/Range coordinates allow mapping the sites in a GIS program.
- United States Geological Survey quadrangle map (USGS quad).
- Site Size – area in m^2. Site size information will show changes in site dimensions over time.
- Elevation – in feet above sea level. This can be used to identify site locations in relation to elevational ecozones.
- Site Type – habitation, artifact scatter, feature, rock alignment, field house, agricultural, or other inferred special use sites as noted by recorders in the field. Site type is useful in reconstructing activities and land use at particular locations.
- Time Period Assigned – Middle Archaic, Late Archaic, Early Pit Structure, Middle Pit Structure, Late Pit Structure, Surface Structure, Post-A.D. 1150 or "No Time Period Assigned" based on the presence or absence of certain ceramic types, projectile point types, architectural forms, and/or dates derived from chronometric

methods such as radiocarbon or archaeomagnetic dating. Assigning time periods to sites allows us to see changes over time.

- Projectile Points – presence or absence of projectile points, types, and associated time periods, to aid in assigning temporality to sites.
- Tabular Knives – presence or absence. Not used in this analysis as only five of the sites in the database indicate their presence.
- Ground Stone – presence or absence. Increased numbers and sizes of ground stone objects can be used to infer greater reliance on agriculture.
- Ceramics – presence or absence of ceramic wares including plain wares, red wares, red-on-buff, red-on-brown, black-on-white, corrugated, or "other." Ceramic styles are used in assigning temporality to sites.
- Architecture – presence or absence of pit structures (semi-subterranean) and/or surface structures (above ground), field houses, or rock alignments indicating a structure. The presence of houses may indicate some level of sedentism.
- Fire-cracked Rock (FCR) – presence or absence. Not used in this analysis.
- Vegetation – modern site vegetation. Some plants present today may also have been available to people living in the area in the past.
- Topography – location on floodplain, ridge, bajada, dunes, or other

features of the landscape. Location choices can indicate the type of activities that people may have been involved in, such as farming.

- Comments – pertinent information provided on some survey forms but not covered by the above categories, including the presence of middens, human remains, shell, turquoise, or other types of artifacts. Information may also include the surveyor's impression regarding the type of site and time period suggested, the extent of the site, or the site's relationship to nearby sites.
- Site Name – if provided.
- Habitation – whether or not the site appears to be a residential habitation site. This kind of designation was not usually given in the survey records, but I inferred it from reports describing sites as having architecture, middens, or a high density and/or diversity of artifacts.

METHODOLOGY

The survey reports and site forms used in constructing the database were prepared by many different individuals and organizations over a long period of time (1940s to the present), and thus they vary in the types of information collected and in the amount of detail recorded. For this reason, certain categories in the database, for example "ceramic types," often contain only basic information, such as "red-on-brown" or "black-on-white," rather than specifying a particular type such as "Galiuro Red-on-brown" or "Boldface Black-on-white." When specific types *were* given, however, that information was instrumental in assigning a particular time period to the site in question. Other useful information, such as percentages of ceramic types present, was recorded only rarely on survey and thus was not available for this analysis. Despite such limitations, enough practical information was acquired from the available records to enable placement of almost all 552 prehistoric sites on a Geographic Information System (GIS) map of the San Simon Valley and to situate a large number of them in time as well as space. As mentioned previously, only 280 of these sites were suitable for use in this analysis.

TEMPORAL DESIGNATIONS

In order to evaluate changes in site dimensions and locations over time, it was necessary to develop criteria that would differentiate among sites of several time periods. Owing to the fact that most of the available data for this thesis come from survey and very little from excavation, temporal separation of many multi-component sites was not possible, and those sites were not used in this analysis. In some cases, I have used more than one method in assigning time periods to sites.

The criteria for assigning time periods to sites are based on ceramic types, projectile point types, and presence or absence of architecture, with occasional corroboration from chronometric dating techniques such as radiocarbon and archaeomagnetic dating. The criteria used in these analyses provide a reasonable method for evaluating temporality among sites, allowing for comparison of site sizes and spatial distribution of sites through time.

Middle and Late Archaic Period Sites (5000 B.C. – A.D. 100)

Archaic sites are generally identified by the presence of flaked and ground stone scatters, Archaic points, and no ceramic sherds. The projectile point types used in association with the Middle Archaic period include Gypsum Cave, Chiricahua, and Pinto (Roth and Huckell 1992). Late Archaic sites are identified with Cortaro points (which can also be found in late Middle Archaic period sites) as well as San Pedro (800 B.C. – A.D. 200) and Cienega (500 B.C. – A.D. 100) projectile point types (Roth and Huckell 1992).

Occasionally, Archaic points are found with sherds, possibly indicating an earlier Archaic occupation beneath a later Pit Structure period occupation. The presence of an Archaic point on a site with sherds, however, does not necessarily indicate an Archaic occupation of the site (Gilman 1997:16), as points could have been collected elsewhere by the later occupants of that site. It is also possible that some Late Archaic point types persisted into later Pit Structure period occupations. In the Jornada culture area of southern New Mexico and western Texas, for example, dates for Late Archaic San Pedro points were found to post-date previously published terminal dates for southern Arizona San Pedro points. In the Jornada area, San Pedro points have been dated to between A.D. 521-573 (Upham et al. 1986:84), which is more than 300 years beyond the terminal date of A.D. 200 suggested by Roth and Huckell (1992) for southern Arizona.

Early on, I defined both Middle Archaic period (5000 B.C. – 2000 B.C.) and Late Archaic period (1500 B.C. – A.D. 100) sites in my database by including only those with diagnostic projectile points present. Of the 552 sites in the prehistoric database, 35 contain one or more of these diagnostic points. These projectile points by themselves, however, are not reliable as indicators of temporality. As noted, some sites containing Archaic projectile points also include ceramics, which indicate the presence of site components from later time periods. It is possible that some of these points may have been collected by later period residents and left out of context, or that there was an Archaic site underlying a later occupation. Only 11 sites were found to have Archaic period projectile points without the presence of ceramics.

There are many sites, however, that may date to the Archaic period and yet have no diagnostic projectile point. These sites are characterized by the presence of flaked stone, occasional ground stone, and no ceramics (Gilman 1997:16). There are 148 sites in the database with no ceramics. Twenty-three of these sites have no indication of site size and are thus not used in the site-size comparison. Four of the aceramic sites are extremely large and consist of dispersed scatters over a considerable area, reducing the likelihood that they are single sites. As noted in survey reports, these include AZ CC:11:19 (BLM), a "large dispersed scatter" in dunes measuring 180,000 m^2; AZ CC:8:3 (BLM), a "48 acre medium to sparse lithic scatter" measuring 194,249 m²; AZ CC:7:17 (BLM), a "1/2 mile by 1/4 mile area of sparse scatter . . . three loci" and AZ CC:6:57 (ASM, BLM) at 385,000 m². The latter is described as having a sparse lithic scatter. Thus, 121 sites without ceramics have been chosen to represent the Archaic period for comparison with later periods (Table 4.1), eliminating the four extreme outliers due to the uncertainty that each of these represents one discrete site.

Probable Archaic Period	121
Early Pit Structure Period	78
Middle and Late Pit Structure Periods	72
Surface Structure Period	9

Table 4.1 Numbers of Sites Used in Site Size Analysis

It is problematic, however, to assume that all aceramic sites are from the Archaic period, when instead it is possible that the lack of ceramics may represent a functional distinction among sites rather than a temporal one. For example, activities that may occur some distance from habitation sites, such as lithic procurement or wild plant collecting could have been carried out at any time during the occupational sequence in the basin. These sites would not of necessity contain ceramics.

In order to refine the Archaic period analysis, I took the 11 sites from the aceramic database that were unambiguously Archaic because they contained one or more Archaic projectile points and no ceramics and evaluated those separately. The mean size for these 11 sites is 5168 m^2, and the median size is 3680 m^2. The means of these sites were then compared to the means of all aceramic sites to assess statistical consistency. The mean size for all aceramic sites is 6351 m^2 and the median is 2125 m^2.

A two-sample t-test (Appendix C) comparing the 121 aceramic site sizes and the 11 more definite Archaic site sizes shows that the two samples are not significantly different. Many of the sites in the larger aceramic database appear to be Archaic and are often noted on survey reports as "Archaic," "Cochise," or with a question mark following one of these designations. It is therefore not unreasonable to employ the larger aceramic database of 121 sites for representing Archaic site sizes in this analysis.

Because Archaic sites were formed by people who were usually more mobile than later people during the Pit Structure and Surface Structure periods (Cordell 1997; Plog 1997; Wills and Huckell 1994), these sites are often smaller and more ephemeral in nature than those produced by more settled groups. Also, in view of the fact that more time has passed since the sites were formed, there have been more opportunities for post-depositional processes to impact the sites (Larson 1996). Destruction of sites due to erosion, or burial of sites under later alluvial deposits is possible, and some sites may have subsequent sites built over them. Other destructive processes include modern construction, livestock grazing, and collection of artifacts by pothunters (Larson 1996).

It is quite possible, then, that smaller, less visible Archaic sites may not have found their way into the survey records as often as later, larger, and more recognizable sites. Given that the mean of definite Archaic sites is also slightly smaller than the mean of all aceramic sites (5168 m^2 versus 6351 m^2), it is also likely that the mean site size for the Archaic period may in fact be somewhat smaller than what is reported in this thesis.

Pit Structure Period Sites (A.D. 100-1050)

The Pit Structure period is identified with the presence of both pit structures and ceramics. Since pit structure architecture is not always recognizable without excavation, the assignment of time periods to sites that were recorded from survey involves analysis of surface artifacts, such as chipped stone, ground stone, and especially ceramics. Specific ceramic types are used to denote different time periods, and radiocarbon and archaeomagnetic dates from the Timber Draw and Hot Well Dunes excavations have helped to confirm the dates of painted wares (Gilman 1997; Gilman and Schriever n.d.; Minnis and York 1993).

Early Pit Structure Period Sites (A.D. 100-650). Early Pit Structure period sites are characterized by the presence of plain and/or red ware ceramics (Gilman 1997) and pit structures. While pit structure architecture is also seen in the Late Archaic period, it differs from that of the Pit Structure period both in form and in size. Late Archaic pithouses were small and irregular, becoming larger and more complex after A.D. 1, corresponding to the appearance of ceramics (Gilman 1995; Wills 2001:479). Since pit structures are not limited to the Pit Structure period and are only rarely discernible from surface survey alone, I have not used them in separating sites by time period for this analysis.

At times, Early Pit Structure period occupations exist as one part of multi-component sites in both earlier Archaic and later Pit Structure periods. The presence of later painted ceramics can make identification of an earlier occupation difficult without excavation since the use of both plain and red wares continued in all later periods along with the addition of painted wares. For this reason, I will use only sites with plain and red wares and without painted wares in order to examine Early Pit Structure period site size, with the understanding that many Early Pit Structure period sites underlying later sites will consequently be left out of the comparison.

There are 81 sites in the database that exhibit only plain and red wares, with no painted wares. Three outliers, or very large sites, have been removed from the comparison since they either contain multiple loci or are described as "scattered" or "dispersed." These sites are AZ CC:11:8 (BLM), with an area of 252,000 m^2 and described in the survey report as a "very large dispersed scatter;" AZ CC:6:67 (ASM) also identified as AZ CC:6:67 (BLM), measuring 300,000 m^2 and listed as having "five concentration areas, four lithic and one ceramic;" and AZ CC:7:91 (ASM), with an area of 390,000 m^2 and described as having "multiple loci with a sparse scatter of lithics and few ceramics." As with large outliers in the aceramic database, it is questionable whether these represent discrete sites. Removal of these three outliers leaves 78 sites to represent the Early Pit Structure period in site size and location comparison (Table 4.1).

Middle (A.D. 650-900) and Late Pit Structure Period (A.D. 900-1050) Sites. Middle Pit Structure period sites, in addition to having plain and red wares which are found in all periods after the Early Pit Structure, also exhibit a small percentage of painted wares, including Dos Cabezas Red-on-brown, Galiuro/Pinaleño Red-on-brown, Boldface/Transitional Black-on-white, Gila Butte Red-on-buff, Santa Cruz Red-on-buff, and an unidentified red-on-white ceramic (Gilman 1997:20-22).

The Late Pit Structure period is identified with a higher proportion of painted pottery and with the addition of Encinas Red-on-brown, Sacaton Red-on-buff, and Classic Mimbres Black-on-white, which appears late in this period (Gilman 1997:20-22). Since most Late Pit Structure sites are not overlain by subsequent occupations, their presence (in the form of Late Pit Structure ceramics) is more visible to surveyors than sites that have later occupations. A few sites, however, do exhibit later Surface Structure period ceramics, which may lead to confusion regarding the time periods that are represented.

It is difficult to separate Middle and Late Pit Structure period sites since painted wares from both periods are commonly found on the same sites. Earlier plain and red wares also continued to be used in both Middle and Late periods. While several sites contain Middle Pit Structure period ceramics, only one site had these types exclusively, and that site had no information on site size. For these reasons, I have chosen to combine Middle Pit Structure and Late Pit Structure period sites for comparison with earlier and later time periods.

Corrugated wares characteristic of the Surface Structure period have been found both in Middle and Late Pit Structure period contexts as well as in the later Surface Structure period sites and so may overlap during the transition to the Surface Structure period. Twenty-seven of the 72 sites used to represent Middle and Late Pit Structure periods in my analysis contain corrugated sherds and this may indicate that they occur late in this period. I included sites with corrugated wares in the analysis as long as no surface structures were present. If a site contains one or more surface structures it is assigned instead to the Surface Structure period.

There are 72 sites representing the Middle and Late Pit Structure periods that will be used in this analysis (Figure 4.1). It is possible that some of these are multi-component sites which overlie Archaic and Early Pit Structure sites. However, the presence of painted wares from the Middle and Late Pit Structure periods suggests that these sites were, in fact, occupied during these later periods, and in most cases with no subsequent occupation.

Surface Structure Period Sites (A.D. 1050-1150)

The Surface Structure period marks a shift in settlement pattern in the basin. The period begins with a change in architecture from pit structures to surface structures. Fewer sites are present in the valley, and they are identified by the presence of one-room structures outlined by a single course of upright cobbles. These single-room structures, constructed during a period when large pueblos were being built further north along the Gila River, are generally interpreted as field houses rather than as habitation sites (Gilman 1997). Although more than one room may be present, they are not often contiguous in San Simon sites during this time period (Gilman 1997:28), although contiguous rooms do appear further north.

Changes in ceramics also occur at this time when Cibola white wares are added to the previously described types, while the proportion of corrugated and Mimbres Black-on-white increases (Gilman 1997:28). Only nine sites within the study area exhibit surface structures and are included in the analysis for this period (Table 4.1).

In order to examine data from another perspective, I also constructed a database consisting of Middle Pit Structure, Late Pit Structure, and Surface Structure periods combined. The motivation for creating this database is that many multi-component sites contain ceramics from all three periods, and thus more sites could be included in the analysis. Another influencing factor is that these three time periods cover a span of 500 years (A.D. 650-1150), which makes them comparable to the Early Pit Structure period, which alone covers 550 years (A.D. 100-650). However, since there are only nine sites with surface structures, the mean site size of 40,001 m^2 for the combined periods is comparable to the 41,812 m^2 mean for Middle and Late Pit Structure period sites excluding those with surface structures. Moreover, because the Surface Structure period appears to have been a time of significant social and demographic change in the study area, I have elected to keep the Surface Structure period sites separate in the final comparative analysis.

Post-A.D. 1150 Period Sites (A.D. 1150-1450)

Few sites are identified for the Post-A.D. 1150 period in the San Simon, and their assignment to this period is based upon the presence of a wide array of new ceramic types, including Chupadero Black-on-white, White Mountain red wares, San Carlos Red-on-brown, Playas Red Incised, Gila Polychrome, Tonto Polychrome, St. Johns Polychrome, Maverick Mountain Black-on-red and Polychrome, and Tularosa Black-on-white (Gilman 1997:30-31).

This appears to have been a time of greatly reduced use of the San Simon Valley (Gilman 1997). While there are 17 sites in the study area with some evidence of Post-A.D. 1150 ceramics, 12 of these are multi-component sites and include temporal indicators from earlier time periods. In the absence of excavation, it is not possible to determine from survey records the extent of site size for just the post-A.D. 1150 component of those sites with multiple or long-term occupations. Therefore, I have chosen to consider sites that represent only the Post-A.D. 1150 period.

There are five sites in the study area that contain Post-A.D. 1150 ceramics exclusively, although survey reports show several large sites dating to between A.D. 1150 and 1450 are located just outside the study area to the north, along the Gila River. Of the five sites within the study area, two have no site size indicated, leaving only three sites to use for comparison. This sample is not large enough to provide an accurate estimate of site size, and as a result I will not attempt to compare Post-A.D. 1150 site size in the study area with that of earlier periods.

MAPPING THE SITES

After developing individual databases for each temporal period as outlined above, this information was entered into a GIS program from which sites are displayed on a map showing the San Simon drainage and surrounding topography (Figure 1.1). For site size and location analyses, sites are divided into different size categories which are visible on the map. Means and medians of site sizes for each time period are also calculated and compared (see Chapter Five).

Site location analysis is also facilitated by mapping these sites in relationship to natural features such as rivers, marshes, and bajada slopes. Increases in site size and density, and changes in site locations are visualized, providing evidence of changes in settlement patterns over time.

SITE FUNCTION

It is important to note that the sites used in this research are not all functionally the same. When surveying, it is sometimes difficult to distinguish site type based solely on the presence of particular artifacts and their distribution. It is necessary to consider what types of activities could have been carried out at the site, the duration and intensity of such activities, and the post-depositional processes that may have affected the visibility of artifact remains (Bevan and Conolly 2004).

Some sites in this study include long-term habitation sites, such as pithouse villages with large and varied concentrations of artifacts, while others may represent logistical sites or short-term occupation sites, for instance camps, lithic procurement or workshop locations, wild plant gathering areas, and other kinds of activity areas. Since the survey data used in this analysis came from many different sources over a long period of time, and some survey forms indicate site function while others do not, there is no standard for determining site function throughout the database. For the purposes of this analysis, a site will be defined as any collection of artifacts assumed to represent human activities, and sites will not be limited to long-term places of habitation.

TEMPORAL PERIOD DURATION

The various temporal periods outlined in this thesis are of contrasting lengths. For instance, the Archaic period sites in the valley represent a period covering at least 1600 years (Late Archaic) and in a very few cases as long as 5000 or more years (Middle and Late Archaic), the Early Pit Structure period covers 550 years, the combined Middle and Late Pit Structure periods extend over 400 years, while the Surface Structure period sites occupy a span of only 100 years. It might be expected then to see more small sites left by mobile people over the duration of the longer Archaic period. Also, all sites within a particular temporal period are not contemporary. This should not take anything away from the results of the analysis since the study is able to show dramatic change in site sizes between periods, even those periods which are relatively shorter than the Archaic period.

SUMMARY

In this chapter I have outlined the collection of data used in my thesis research and the sources from which the data were obtained. I have explained my research methods including the rationale for study area boundaries and for the inclusion or exclusion of sites in my analysis. Criteria for determining temporal designation of sites for comparative analysis are offered.

One hundred twenty-one sites were determined to be probable Archaic period sites as outlined above. Other sites were assigned to time periods as follows: Early Pit Structure period, 78; Middle and Late Pit Structure period, 72; and Surface Structure period, nine. The establishment of these temporal categories makes possible the analysis of settlement pattern changes over time, addressing the research questions of how site sizes and site locations changed over time.

CHAPTER FIVE

SETTLEMENT PATTERN ANALYSIS

This research examines settlement patterns and addresses the research questions using two approaches. Mean site sizes are calculated for each temporal period and compared through time, and alterations in the ways that sites were situated across the landscape are considered as well. The results of these analyses, along with the additional support of artifactual data, are then used to explore likely causes for the observed changes and to consider the possible long-term consequences of population growth and land use in the San Simon Basin.

SITE SIZE ANALYSIS

Site size is used in this analysis to address the question of population growth that occurred in the San Simon Basin. Although archaeologists have used the areal extent of sites often in attempting to estimate population, site size and population do not always correlate and variables such as site type and topography may affect site densities (Schreiber and Kintigh 1996). My analysis, however, will not attempt to estimate actual population, but rather it will show increases over time in sizes of sites within the basin, inferring growth in population, followed by a decrease in both site size and number, indicating the abandonment of the basin. Moreover, because the data for my analysis were collected during surface surveys, and pit structure architecture is not usually visible on the ground surface, it is not possible to estimate numbers of structures.

While the numbers of sites also change in the study area over time and can contribute to the argument for population growth followed by decline, actual numbers of sites for each temporal period are difficult to discern given the number of multi-component sites present in the basin. In the following pages, I will illustrate the changes in site sizes and numbers in particular locales within the basin in order to illustrate the significant growth that occurred during the Pit Structure period.

The sizes of sites in the study area changed significantly over time, increasing from the Archaic through the Pit Structure periods and then decreasing again during the Surface Structure period (Table 5.1). Site size, and presumably population in the valley, appears to have peaked during the Middle to Late Pit Structure periods between A.D. 650 and 1050. After this time, few sites remained in the San Simon Basin, and these were reduced in size from the previous period. Results of site size analyses for these time periods are presented here and compared. This is followed by a discussion of the possible implications of site size change over time.

Site Size Summary		
Probable Archaic Sites:		
N=121	mean=6351 m²	median=2125 m²
Early Pit Structure Sites:		
N=78	mean=17,307 m²	median=5924 m²
Middle, Late Pit Structure Sites:		
N=72	mean=41,812 m²	median=12,037 m²
Surface Structure Sites:		
N=9	mean=18,638 m²	median=7128 m²

Table 5.1 Mean and Median Site Sizes by Time Period

Archaic Period Site Size

As noted in Chapter Three, the majority of Archaic sites in the area date to the Late Archaic period, which spans roughly 1600 years. I have used 121 sites without ceramics to investigate site size during the Archaic (pre-ceramic) period. Site sizes in this database range from a 1 m^2 lithic scatter to a 75,000 m^2 site with rock piles and a chipped stone scatter. The mean size for these sites is 6351 m^2, and the median is 2125 m^2 (Table 5.1). The majority of aceramic sites are quite small; more than half (64 percent) are smaller than 5000 m^2, and half of those (32 percent of total sites) are very small at less than 500 m^2 in size (Figure 5.1).

Most of these aceramic sites (89) are described as either lithic scatters or rock features with a lithic scatter. In a few cases, site functions have been suggested, but most survey reports related to aceramic sites do not contain such information. Some of the suggested functions for these sites include "tool manufacturing or lithic procurement," "food processing or gathering," or "camp or temporary habitation" as noted in survey reports.

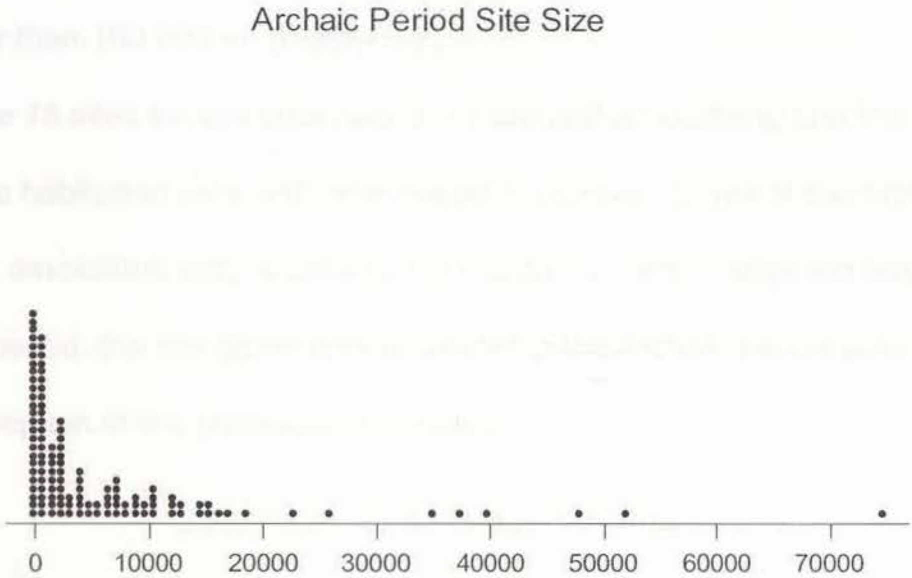


Figure 5.1 Archaic Period Site Size Distribution in m².

Early Pit Structure Period Site Size

Early Pit Structure period sites cover a period of 550 years and are represented in this analysis by 78 sites containing only plain and red wares and none of the painted ceramics from later periods. The mean site size for this category is 17,307 m², with a median size of 5924 m² (Table 5.1). Sites range in size from an artifact scatter of 25 m² to an 118,064 m² site containing hearths and a scatter of lithics and ceramics. There are fewer small sites compared to the Archaic period, but they are still well represented, with 34 sites (44 percent of 78 sites) being smaller than 5000 m². Sites under 500 m² also decrease in number, with only 12 (15 percent of 78 sites) included in this category. More large sites are present for this time period with nine sites measuring more than 50,000 m² and one reaching an area greater than 100,000 m² (Figure 5.2).

Of the 78 sites for this time period, 71 are artifact scatters, and four appear to be habitation sites with possible pit structures. Some of the artifact scatters are associated with hearths or rock features. While sites are larger during this period, the site types appear similar to the Archaic period sites with the exception of the presence of ceramics.

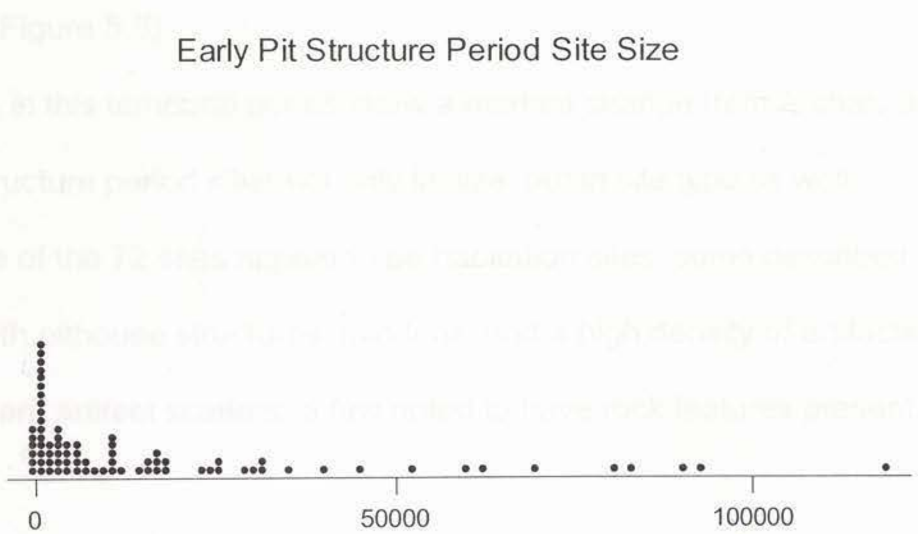


Figure 5.2 Early Pit Structure Period Site Size Distribution in m².

Middle and Late Pit Structure Period Site Size

As noted previously, I have combined Middle Pit Structure and Late Pit Structure period sites for site size comparison. The duration of these combined periods is 400 years. Seventy-two sites are used to evaluate site size for the period, and they have a much wider range of sizes, extending from a small artifact scatter of 23 m^2 to a much larger scatter of 321,300 m^2. Eleven sites in this category are 100,000 m^2 or larger (roughly 25 acres or 10 hectares). Mean site size for this period is 41,812 m^2, while the median is 12,037 m^2 (Table 5.1). Twenty-seven sites (38 percent of 72) are smaller than 5000 m^2, but only five sites (7 percent of 72) are smaller than 500 m^2 for this period (Figure 5.3).

Sites in this temporal period show a marked change from Archaic and Early Pit Structure period sites not only in size, but in site type as well. Twenty-nine of the 72 sites appear to be habitation sites, some described as "villages" with pithouse structures, middens, and a high density of artifacts. Other sites are artifact scatters, a few noted to have rock features present.

Middle/Late Pit Structure Period Site Size

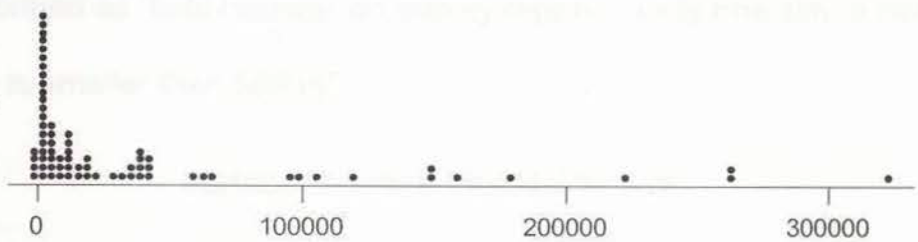


Figure 5.3 Middle and Late Pit Structure Period Site Size Distribution in m².

Surface Structure Period Site Size

The Surface Structure period in the San Simon study area signals a change in settlement pattern and a decrease in the number of sites, site size, and presumably population. Large above-ground structures were built along the Gila River to the north during this period (Gilman 1997:9; Lekson 2006; Neuzil 2006) and people appear to have aggregated into this new architectural form there. The surface structure sites found in the study area are small single-room houses rather than large multi-roomed pueblos and may represent farmsteads (Gilman 1997:39).

While there are 36 multi-component sites with corrugated ceramics which are present in the Late Pit Structure and the Surface Structure periods, there are only nine sites with actual surface structures. Although the sample size is small, it likely reflects the smaller "footprint" of people during this period in the San Simon drainage. The nine sites with surface structures have a mean site size of 18,638 m² and a median size of 7128 m² (Table 5.1). Site size ranges from 36 m² to 60,225 m² (Figure 5.4), and sites are usually described as "field houses" on survey reports. Only one site, a single field house, is smaller than 500 m².

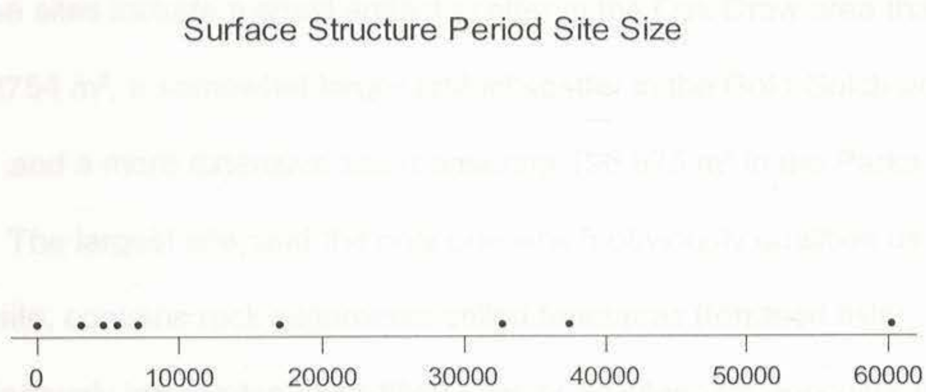


Figure 5.4 Surface Structure Period Site Size Distribution in m².

Post-A.D. 1150 Period Site Size

There are even fewer sites present in the San Simon Basin for evaluating site size during the Post-A.D. 1150 period, and this appears to be a time of further population reduction. As with the Surface Structure period, however, there are large multi-roomed, multi-storied pueblos present to the north (Gilman 1997; Lekson 2006; Neuzil 2006). While 15 sites in the study area have some sherds that are representative of this period, only five sites have Post-A.D. 1150 ceramics exclusively. Two of those have no site size given on survey reports, leaving only three sites for comparison. Although this is too small a sample for evaluating differences in site size among periods, it should be noted that the three Post-A.D. 1150 sites are very different from each other in size and location.

These sites include a small artifact scatter in the Oak Draw area that measures 2754 m^2, a somewhat larger artifact scatter in the Gold Gulch area of 8217 m^2, and a more extensive site measuring 196,875 m^2 in the Parks Lake area. The largest site, and the only one which obviously qualifies as a residential site, contains rock alignments called *trincheras* (terraced hills), which are variously interpreted as fortified sites or as sites with agricultural terraces (DesertUSA 2007). This site is near the Whitlock Cienega, which remained a water source until the 1940s (Gilman 1997:39), possibly justifying the late presence of the site.

Site Size Comparison

In order to test the magnitude of the differences between site sizes, I performed a one-way analysis of variance (ANOVA) comparing the Archaic, Early Pit Structure, and Mid/Late Pit Structure periods (Appendix C). The F ratio is 18.75, and the p value is <.0001, showing significant differences in site sizes from the different time periods. There were not enough sites in the

Surface Structure period to use in the analysis, but the mean site size of that period closely corresponds to that of the Early Pit Structure period.

During the Archaic period, most sites are quite small. As an example of the relative number of small sites present, I have calculated percentages of sites for each interval that are smaller than 10,000 m² (roughly two and a quarter acres, or one hectare) (Table 5.2). As for the largest sites in the

Archaic period	80%
Early Pit Structure period	56%
Middle/Late Pit Structure period	46%
Surface Structure period	56%

Table 5.2 Percentage of Sites Smaller than 10,000 m²

study area, there are only a few greater than 100,000 m² (24.7 acres or 10 hectares), and only one of those occurs in a period other than in the Middle and Late Pit Structure periods (Table 5.3).

Archaic period	None
Early Pit Structure period	1
Middle/Late Pit Structure period	11
Surface Structure period	None

Table 5.3 Number of Sites Larger than 100,000 m²

Mean and median site sizes show a significant increase between the Archaic and Early Pit Structure periods and again between the Early Pit Structure period and Middle/Late Pit Structure periods before decreasing during the Surface Structure period (Table 5.1, Figures 5.5 and 5.6). Mean site size increased nearly threefold between the Archaic and Early Pit Structure period, and the means of the Middle and Late Pit Structure period more than doubled in size from Early Pit Structure period sites. The Middle and Late Pit Structure period mean site size is nearly six times that of Archaic sites (Figure 5.5). During the Archaic and Early Pit Structure periods, the majority of sites are small, but increasingly there are larger sites, and the range of site sizes increases, reaching its greatest extent during the Middle and Late Pit Structure period, representing the peak of San Simon Basin population.

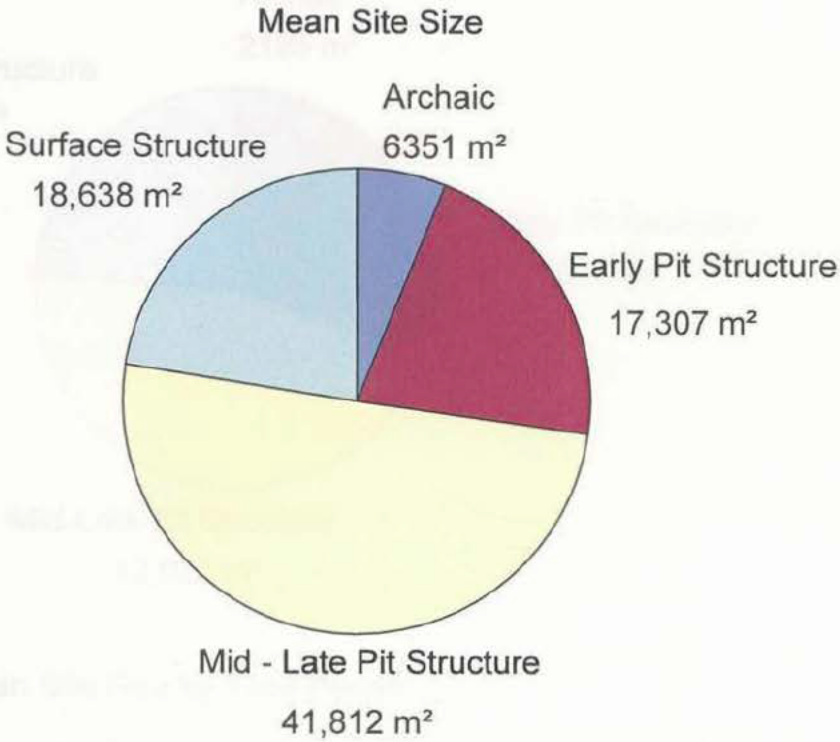


Figure 5.5 Mean Site Size by Time Period

Following the Late Pit Structure period peak, the Surface Structure period mean site size exhibits a sharp decline, and it is similar to the Early Pit Structure period mean site size (Figures 5.5 and 5.6). It is at this time that population in the study area is reduced as people apparently left the valley for other locales such as along the Gila River. There are too few subsequent Post-A.D. 1150 sites in the San Simon Basin to evaluate site size for that period, but the dearth of sites reinforces the idea that the basin was abandoned.

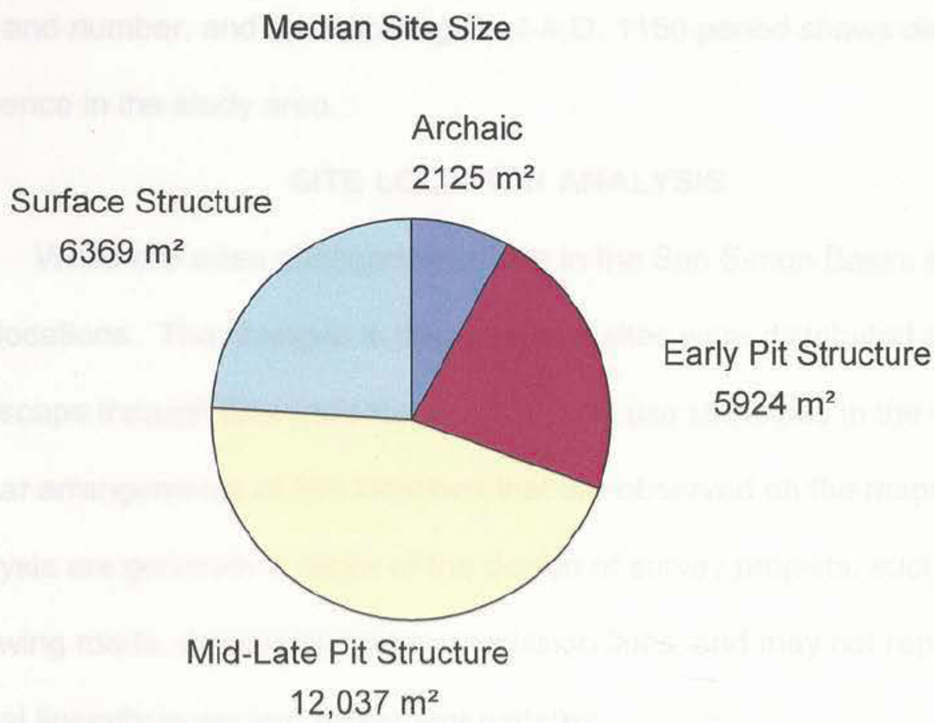


Figure 5.6 Median Site Size by Time Period

In summary, the data have clearly demonstrated that sites did increase significantly in size over the course of the Pit Structure period, suggesting that population levels in the San Simon basin grew as well, peaking during the Middle and Late Pit Structure periods. Small sites from the pre-ceramic period show no evidence of long-term habitation, although it is possible that Archaic residential sites may be obscured by later occupations. Once ceramics were introduced, during the Early Pit Structure period, site size nearly tripled, and there are a few sites that are described as "villages." It is in the Middle and Late Pit Structure periods, however, when site size doubled again and several "large villages" are noted on survey reports. The following Surface Structure period shows a dramatic drop in site size and number, and the following Post-A.D. 1150 period shows almost no presence in the study area.

SITE LOCATION ANALYSIS

While site sizes changed over time in the San Simon Basin, so too did site locations. The changes in the ways that sites were distributed across the landscape through time indicate a shift in land use strategies in the region. Linear arrangements of site locations that are observed on the maps in this analysis are generally a factor of the design of survey projects, such as those following roads, drainages, and transmission lines, and may not represent actual linearity in ancient settlement patterns.

In order to illustrate differences in site sizes on the maps in this section, I have divided the database into four size categories. This is an arbitrary division, based on a fairly even distribution of site numbers for three of the four categories, and it is used only to illustrate sites of varying sizes on maps of the basin. Of 280 sites, 80 are smaller than 1000 m^2 (1/4 acre or 0.1 hectare), 99 sites are between 1000 and 10,000 m^2 (up to 2.25 acres or 1 hectare), and 89 sites are between 10,000 and 100,000 m^2 (up to 24.7 acres or 10 hectares). Twelve sites that are much larger than the rest, with an area greater than100,000 m^2, are shown separately.

Archaic Period Site Locations

Archaic sites are generally small and are distributed throughout the drainage in a variety of settings, from higher elevation areas in the Whitlock Mountains, to the foothills and bajada slopes of the Pinaleño and Dos

Cabezas Mountains and into the terraces and river bottom areas near the San Simon River (Figure 5.8). Of the 121 Archaic sites in the study, there are no sites greater than 100,000 m^2 and only 24 that fall into the 10,000 to 100,000 m^2 size category. Site distribution does not appear to be affected by site size. Whether sites are small or large, they are dispersed among a variety of locales. As illustrated in Figure 5.8, many sites at this time are present along the San Simon River drainage, and this occupation intensifies in subsequent periods.

Archaic people no doubt used these sites for different activities, including temporary camps for hunting and gathering, lithic procurement and manufacturing, small-scale cultivation, and other purposes. The fact that these small Archaic sites are numerous is likely related to the relatively longer time covered by this period and the mobile way of life of the people who left these remains.

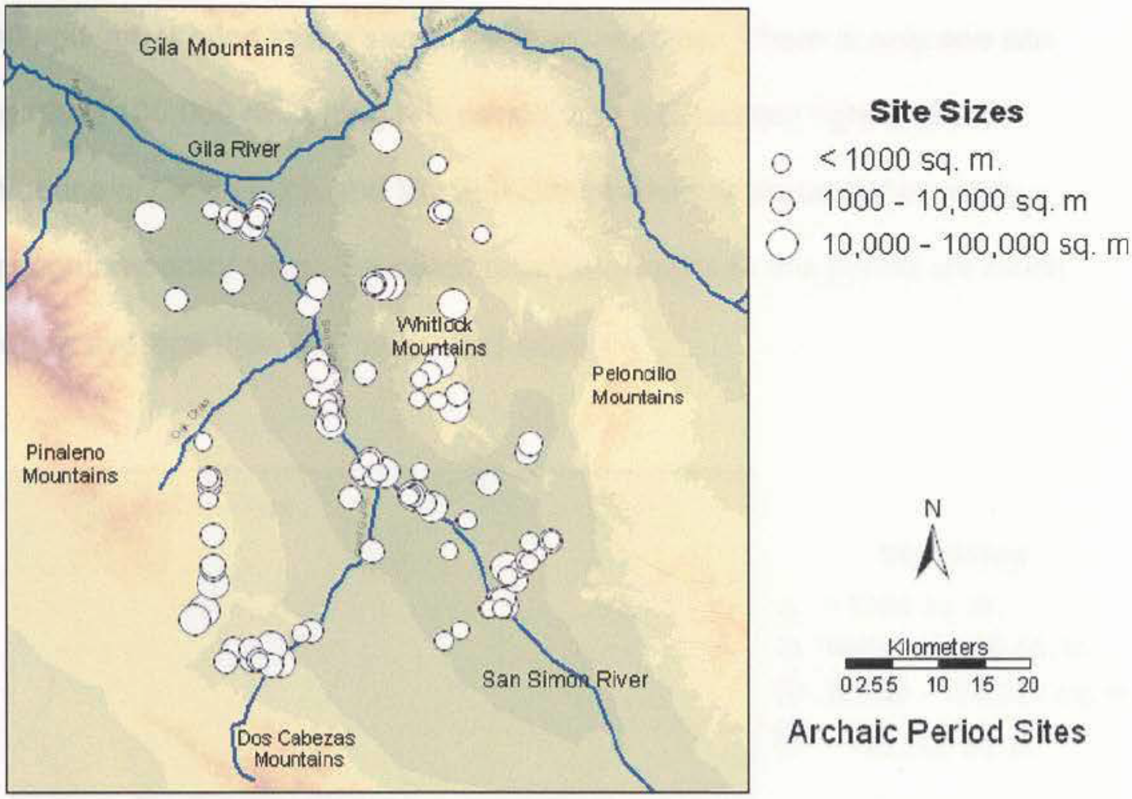


Figure 5.8 Archaic Period Site Locations

Early Pit Structure Period Site Locations

Early Pit Structure period sites (Figure 5.9) are not as widely distributed on the landscape as Archaic sites, but yet they still occupy a variety of locales. Many Archaic and Early Pit Structure period sites occupy the same space (Gilman 1997) and I am thus not able to separate these sites into separate periods for this analysis. There are, however, slight differences in the ways that identifiable sites from the two periods are situated on the landscape. Early Pit Structure period sites tend to be located more often near sources of water such as the river, the cienegas, and secondary drainages. As with the Archaic period, however, there are no clear distinctions in location as related to site size. In other words, there are both small and larger sites in the same kinds of locations. There is only one site larger than 100,000 m² during this period, and it is located right at the confluence of Gold Gulch and the San Simon River, surrounded by many other contemporary sites. As noted previously, sites in this period are much larger on average than Archaic period sites.

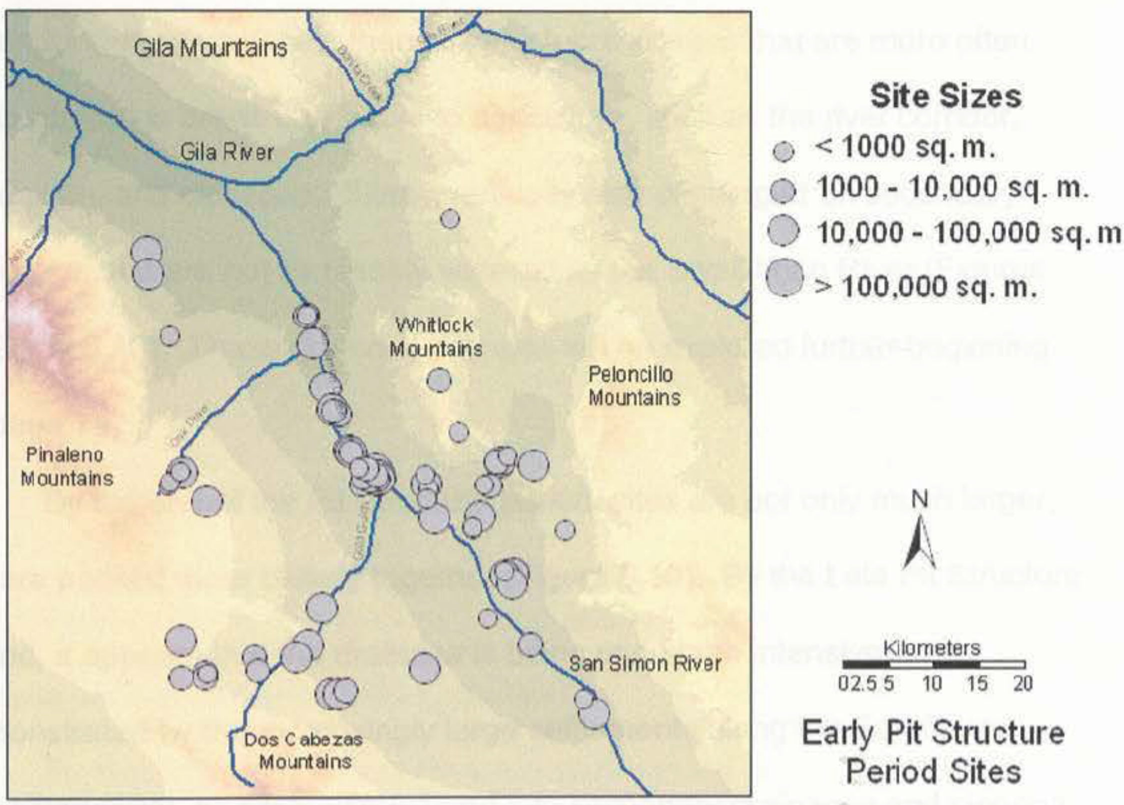


Figure 5.9 Early Pit Structure Period Site Locations

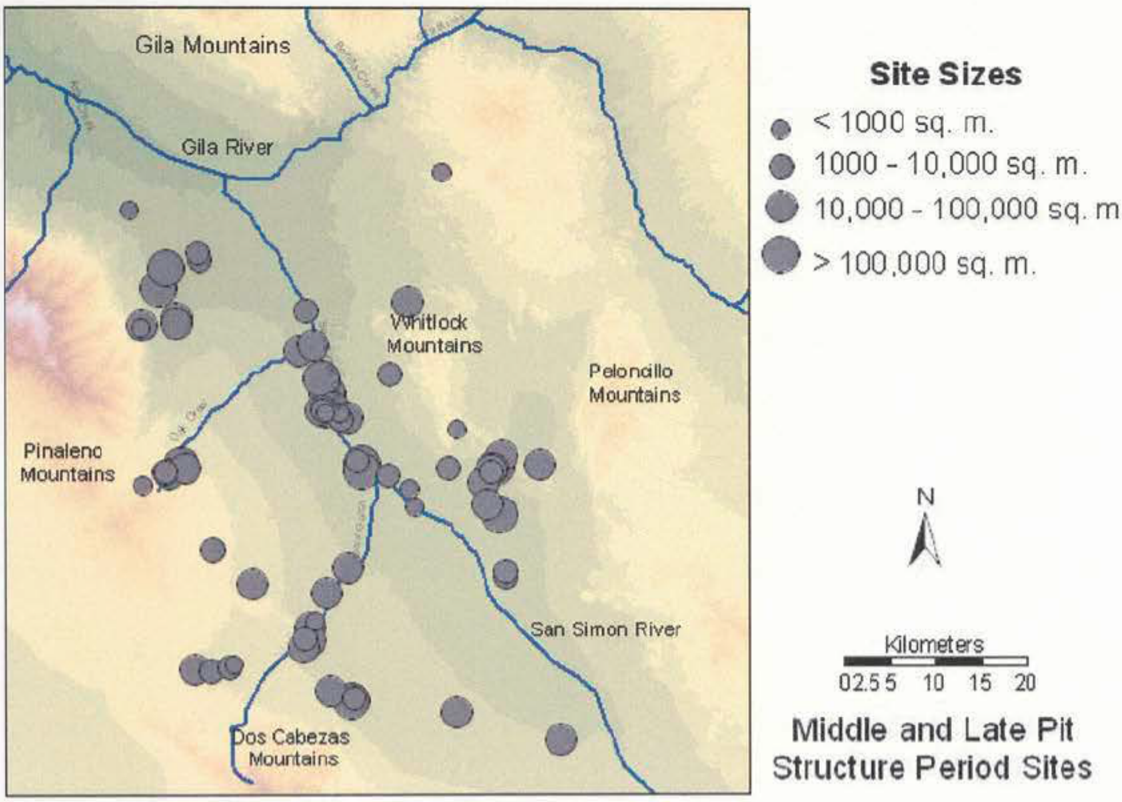
Middle and Late Pit Structure Period Site Locations

During the Middle and Late Pit Structure periods, sites continue to grow in size and maximize the use of the San Simon River corridor, the Whitlock Cienega, and secondary drainages such as Oak Draw and Gold

Gulch (Figure 5.10). There are also some very large sites in the lower bajada of the Pinaleño Mountains. Although people occupied some areas used during the Archaic period, the later sites are not the very small, short-term use sites seen in the Archaic, but are in many cases large to very large village sites as demonstrated in the site size analysis above.

Over the course of the Pit Structure period, very small, scattered, short-term use or logistical sites are replaced (or overlain) by increasingly larger, long-term use sites, many of which are villages that are more often concentrated in areas conducive to agriculture, such as the river corridor, flood plain, and cienegas. Sites eventually also converged on secondary drainages that are not as reliably watered as the San Simon River (Figures 5.12 and 5.13). These dramatic changes will be explored further beginning on page 79.

By the end of the Pit Structure period, sites are not only much larger, but are packed more closely together (Figure 5.10). By the Late Pit Structure period, it appears that the drainage is being used both intensively, as demonstrated by the increasingly large settlements along the San Simon, and extensively, as sites also expand into secondary drainages and cienega areas. This expansion of site sizes and locations suggests that agriculture was becoming increasingly important to people in the basin and land favorable for cultivation was at a premium. People responded to the limitations imposed by the landscape by concentrating settlements in areas favorable for agriculture and in turn they shaped the land as they settled and engaged in farming, constructed terraces, check dams, and rock bordered gardens, and cleared land for crops.



5.10 Middle and Late Pit Structure Period Site Locations

Surface Structure Period Site Locations

Surface Structure period sites, identified by the presence of field houses, are sparse in the basin and are located mostly in the Gold Gulch drainage, with one appearing in the Whitlock Cienega area (Figure 5.11). At the same time, however, large multi-roomed pueblos are present in the northern end of the drainage near the Gila River. There are no sites located on the San Simon River floodplain during the Surface Structure period, suggesting perhaps it was not favorable for agriculture following the intensive usage of the Pit Structure period.

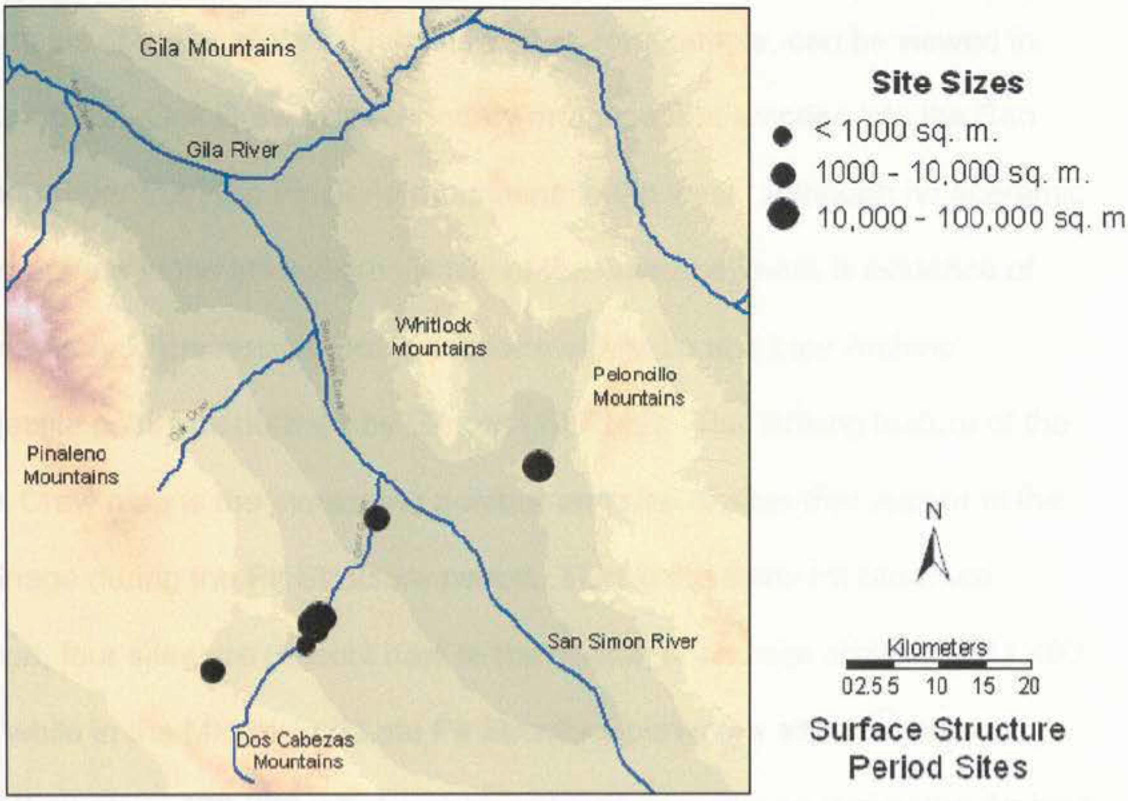


Figure 5.11 Surface Structure Period Site Locations

A CLOSER LOOK

It is difficult to illustrate the suggested changes at the scale of the basin as a whole. The questions of whether population increased and people began to rely more on agriculture during the Pit Structure period is thus considered by examining land use in smaller areas along the river and in secondary drainages and cienegas. As prime agricultural lands became scarce, it is likely that people began to build larger villages along the river and to make more use of other locations for cultivation, such as in cienega areas and in less well watered secondary drainages.

This process can be better visualized by looking more closely at examples of these areas. Oak Draw sites, for example, can be viewed in Figure 5.12. Oak Draw is a secondary drainage that empties into the San Simon River from the Pinaleño mountains to the west. Although no aceramic sites appear in the immediate vicinity of the drainage, there is evidence of some Archaic presence there in the form of Middle and Late Archaic projectile points as outlined by Gilman (1997:42). The striking feature of the Oak Draw map is the increasing number and size of sites that appear in the drainage during the Pit Structure period. During the Early Pit Structure period, four sites are present next to the drainage, and site sizes total 11,400 m², while in the Middle and Late Pit Structure period six sites are present, and they cover 179,220 m². From an ephemeral presence during the Archaic period, settlement expanded dramatically over time with increasing numbers and sizes of sites, with one large village reaching 120,000 m² in size.

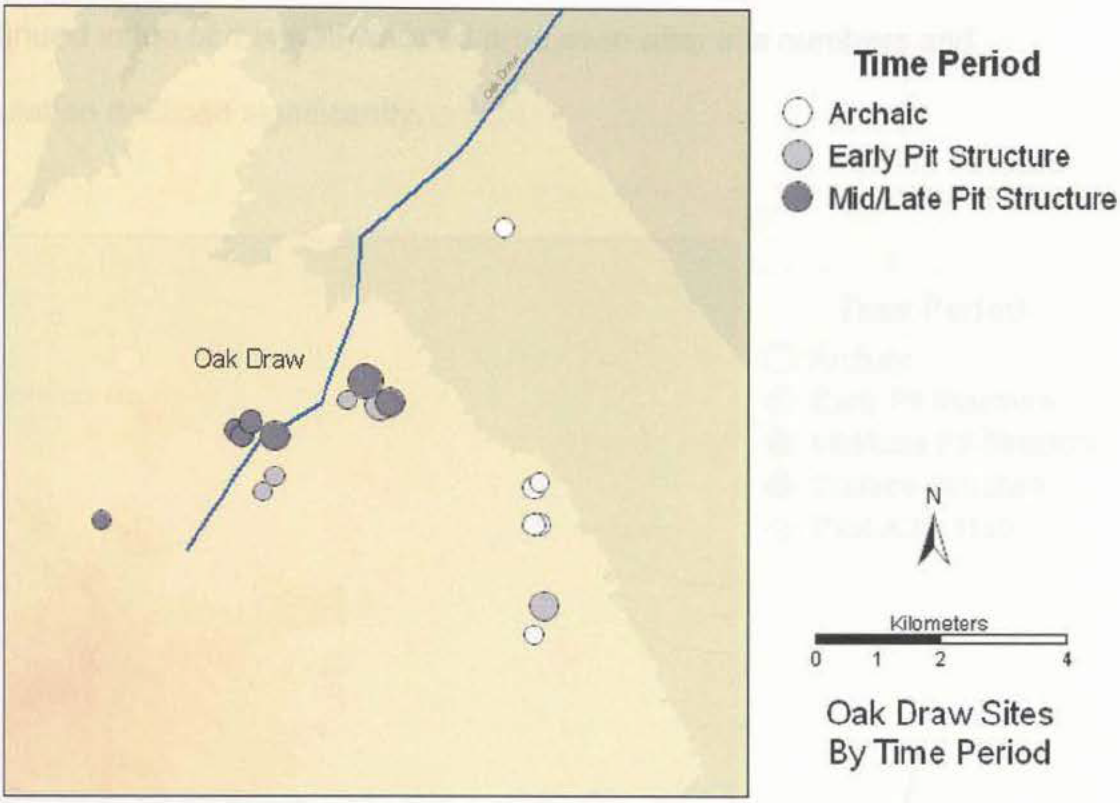


Figure 5.12 Oak Draw Sites
Dot sizes represent site sizes as shown in maps above.

Sites in the Parks Lake and Whitlock Cienega area (Figure 5.13) echo the remarkable findings in Oak Draw. This area was a marshy, well watered locale, although not on a major drainage. There are three very small Archaic period sites in the area that total 14,470 m². Pit Structure period sites get increasingly larger and more numerous over time. Seven Early Pit Structure period sites combine to cover 83,334 m², while another seven Middle and Late Pit Structure period sites encompass 304,004 m². There is also one later Surface Structure period site present measuring 32,665 m² and, as mentioned previously, the very large Trincheras site from the Post-A.D. 1150 period of 196,875 m². The presence of these isolated sites indicates the continued value of this well-watered area even after site numbers and population declined significantly.

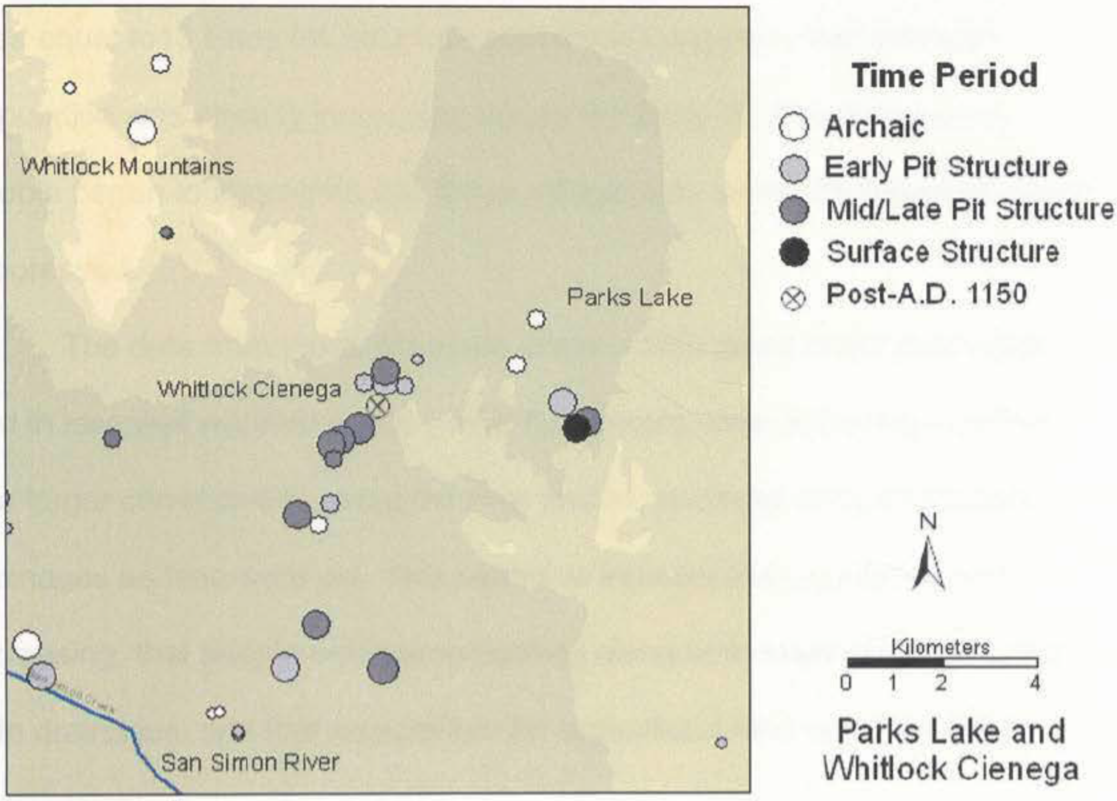


Figure 5.13 Parks Lake and Whitlock Cienega Area Sites
Dot sizes represent site sizes as shown in maps above.

While the Oak Draw and Whitlock Cienega areas saw growth that peaked during the Middle to Late Pit Structure period, development in one of the more favorable locales for agriculture along the San Simon River also increased. In the southern portion of the study area, two drainages, Gold Gulch and Timber Draw, flow into the San Simon River (Figure 5.14). At the confluence of these drainages, changes can be seen by examining variation in site sizes through time. During the Archaic period, seven sites cover an area of 31,396 m^2. There are 13 Early Pit Structure period sites that total 252,456 m^2, while three Middle and Late Pit Structure period sites encompass an area of 255,625 m^2. The fact that three late sites cover an area equal to13 Early Pit Structure period sites suggests that although population was already increasing during the Early Pit Structure period, people began to aggregate into larger village sites as the Pit Structure period progressed.

The data from these disparate areas – both along major drainages and in less well watered areas – infer that people were gathering together into larger communities along the river and increasingly using secondary drainages as time went on. This seems to indicate that population was increasing, that people were congregating along both major drainages and side drainages, and that competition for agricultural land was increasing.

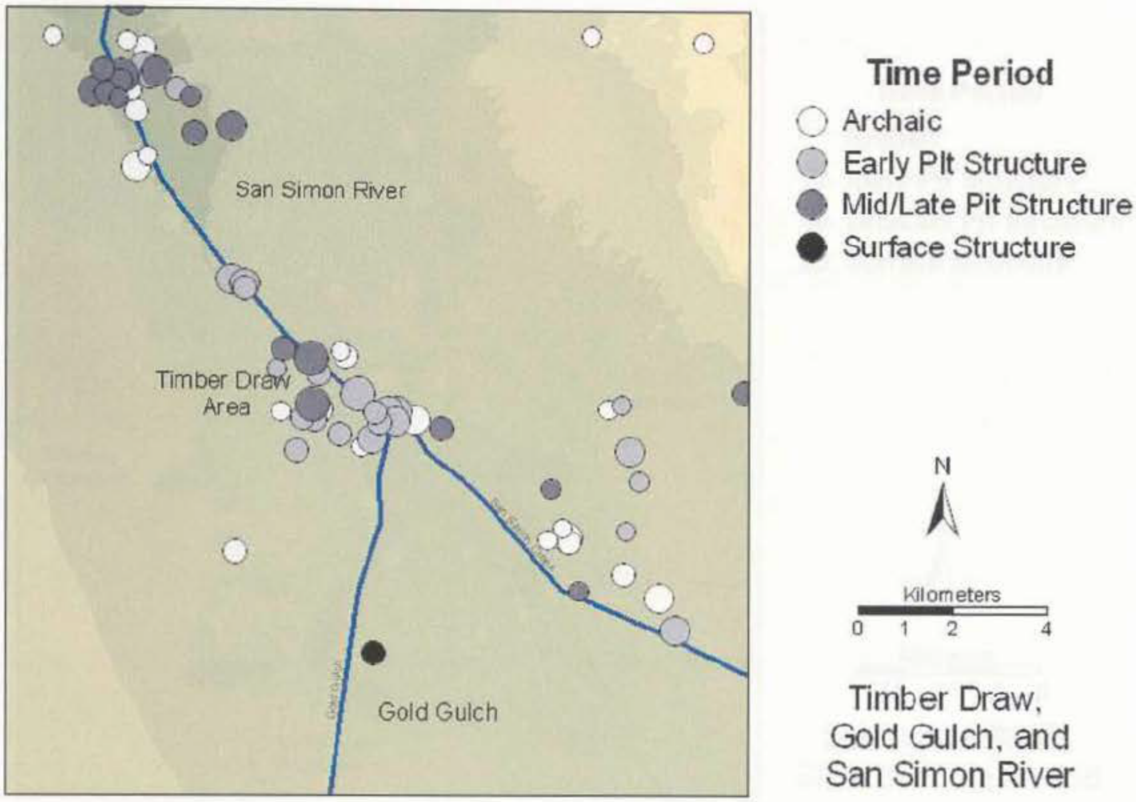


Figure 5.14 Sites near the Confluence of Timber Draw, Gold Gulch, and the San Simon River.
Dot sizes represent site sizes as shown in maps above.

SITE LOCATION CHANGE OVER TIME

In order to illustrate the settlement pattern of the San Simon Basin over time, a map of sites from different time periods is presented (Figure 5.15). It should be noted here once again that not all the basin, or even the entire river corridor, has been surveyed. Therefore, this analysis is subject to modification when new information becomes available.

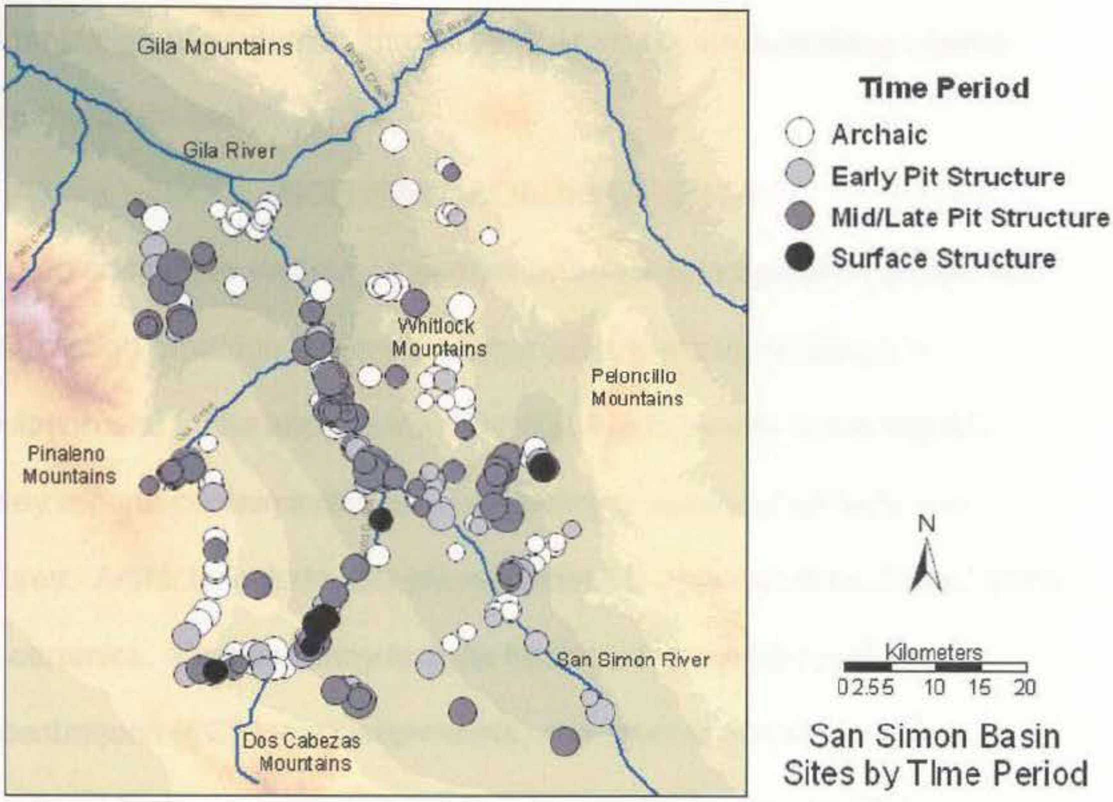


Figure 5.15 San Simon Basin Sites – All Periods
Dot sizes represent site sizes as shown in maps above.

In summary, the Archaic period pattern of small sites using a variety of locales changed throughout the Pit Structure period as sites became larger, especially near the river, the cienega, and even into lesser side drainages. The pattern abruptly changed once again as Surface Structure period sites declined in size and number (Figure 5.15) as the basin was nearly abandoned in favor of the construction of large above-ground pueblos to the north. The detailed analyses of these three areas in particular strongly suggest increasing population over time, probably resulting in competition for agricultural land, and crowding of prime agricultural areas. The eventual abandonment of the area after the Pit Structure period further suggests a reorganization of economic strategies in response to decreasing returns within the basin itself.

NON-SPATIAL SURVEY DATA

In addition to settlement pattern evidence for population growth and the formation of villages, there are other indications of increases in population and in the importance of agriculture to people in the region. Survey reports contain information regarding a variety of artifacts and features. Artifacts include, but are not limited to, ground stone, flaked stone, and ceramics. Features may include hearths, fire-cracked rock concentrations (FCR), rock alignments, and other findings interpreted as agricultural features, such as terraces, grid gardens, and check dams.

This section presents artifactual evidence to address the research question of whether people were becoming more dependent upon agriculture over the course of the Pit Structure period. Chapter One presents evidence from other researchers concerning artifacts and features that support increasing population, sedentism, and dependence on agriculture.

Ground Stone

There is evidence for increasing dependence on agriculture in the ground stone artifacts reported from surveys. The data available for this thesis do not contain enough information to analyze changes in the size of ground stone tools over time, and so percentages of ground stone have been used although there is no hard evidence that increasing percentages of ground stone correlate directly with dependence on agriculture.

Although not all ground stone tools are used for grinding food, many site reports note the presence of manos and metates used in processing plant foods. Percentages of sites with ground stone increased between the Archaic period, the Pit Structure period, and the Surface Structure period (Table 5.2). The fact that these tools increased proportionately through time is consistent with the idea that people were making more use of cultigens as time went on. The later Surface Structure period shows the highest percentage of ground stone even though sites decreased in size and number at this time in the San Simon Basin. Given that Surface Structure period sites also contain field houses, it is likely that these sites continued to be used for agricultural purposes even as people began moving away from the basin.

Archaic Period	55%
Early Pit Structure Period	73%
Middle and Late Pit Structure Period	75%
Surface Structure Period	89%

Table 5.4 Percentage of Sites Containing Ground Stone

Agricultural Features

Survey data used in this thesis sometimes note the presence of agricultural features such as terraces, check dams, cleared fields, cobble alignments, and rock-bordered gardens. While there is insufficient data for analysis in this thesis, the presence of such features is consistent with agricultural practices, and should therefore be acknowledged.

SUMMARY

Analysis of survey data clearly shows that sites in the San Simon Basin increased significantly in size between the Archaic and the Middle/Late Pit Structure periods, decreasing again during the Surface Structure period. There appears to be little subsequent occupation of the basin. Sites also varied with regard to location over time, as villages were increasingly clustered along the San Simon River and then expanded into secondary drainages and other sources of arable land as competition for land increased and people altered economic strategies.

A focus on three particular areas of the basin – Oak Draw, Whitlock Cienega and Parks Lake, and the confluence of the San Simon River with Timber Draw and Gold Gulch – provide a closer look at the changes in site size and location through time in both prime areas and less well watered areas. In each of these areas, sites become more clustered and larger between the Archaic and the Middle to Late Pit Structure periods, suggesting increased population, more settled lifeways, and competition for land that was suitable for cultivation.

Additionally, percentages of ground stone artifacts increase over time, supporting the idea of a rise in the use of cultigens, while reports of agricultural features attest to the presence of cleared fields, terraces, and other signs of cultivation. As noted previously, Chapter One also includes artifact studies by others, including analysis of ceramics, flaked stone, ground stone, faunal remains, macrobotanical remains, architecture, and agricultural features which strengthen the idea of increases in sedentism and agriculture over time.

CHAPTER SIX

IMPLICATIONS OF THE SAN SIMON SETTLEMENT PATTERN ANALYSIS

In the San Simon Basin, settlement pattern data reveal a significant increase in site size during the Pit Structure period as well as a higher density of sites in well-watered areas, such as along the San Simon River and in the vicinity of the Whitlock Cienega. During the Early Pit Structure period, sites also began to grow in secondary drainage locations, such as Oak Draw and Gold Gulch, with the eventual placement of very large village sites during the Middle and Late Pit Structure periods in areas that may have been less productive for agriculture. Alternatively, it is possible that a favorable climate allowed agriculture in areas that are untenable for cultivation today. It is also feasible that competition for prime agricultural lands increased, and people became more sedentary in order to establish claim to valuable farm lands. Settlement patterns showing the development of large villages, when combined with indications for increased reliance on agriculture (Chapters One and Five), suggest a possible increase in sedentism and a dramatic rise in population over the course of the Pit Structure period.

The growth that took place over the 950 year Pit Structure period could have had a detrimental impact on the local environment. This idea is supported by faunal analysis (Schmidt 2006) as noted in Chapter One and by the fact that settlement pattern data show a relatively rapid decrease in the number and size of sites following the Pit Structure period. The San Simon

Basin appears to have been little used between the end of the Late Pit Structure period and historic times. There are, however, other factors which could account for the abandonment of the drainage, including climatic, economic, or social reasons.

Today the San Simon drainage continues to exhibit little in the way of residential occupation. It is an arid, Chihuahuan desert environment with only intermittent arroyos and streams, and the San Simon River is itself a dry riverbed except when the summer monsoons arrive. Riparian vegetation clusters along the banks of the river, and plants are sparse elsewhere. As noted in Chapter Two, anthropogenic impact in historic times has contributed to the downcutting of streams and desertification of the area. Although the San Simon basin is considered to have been more well-watered prior to modern human impact, the environmental situation in the prehistoric period remains unclear regarding the potential for dry farming.

Although the data in this thesis only indirectly address sedentism and agriculture, there are implications that increasingly sedentary populations engaged in farming in the Pit Structure period and could thus have had an anthropogenic impact on the basin. Whether or not human environmental effects played a role in abandonment of the basin is a subject for future research since other factors such as social causes or climate change may have been involved as well, but cannot be addressed in this analysis.

FUTURE RESEARCH

Many questions remain regarding the details of the ancient occupation and subsequent abandonment of the San Simon Basin. In order to accurately estimate population for the region at any point in time, it would be necessary to estimate the number and size of sites present during each period. As mentioned in Chapter One, this thesis is based on survey reports that cover only a small part of the study area, leaving large sections unrepresented by the data. A systematic survey of the basin, sampling all of its varied environmental zones, would assist in developing a clearer picture of settlement patterns and in generating more accurate population estimates. Estimating the number of structures, or individual rooms, is not feasible from survey records because of the poor visibility of pit structures.

There are only a few excavations from the study area and much information could be gained through further such projects in the region. Many multi-component sites exist that cannot be separated into their various temporal periods based on survey alone. Excavations of more sites, such as those that have been carried out at Timber Draw, would be helpful in identifying multiple occupations of single sites and in then extrapolating that kind of analysis to other sites. It would also be useful to excavate a number of different site types and sizes in order to better understand the various ways that people made use of the land.

The question of subsistence practices and specifically of agricultural dependence could be more directly addressed through examining a greater number of macrobotanical remains. Such studies are sparse from the basin, and further investigation would certainly facilitate a better understanding of the economic strategies of the people who lived here.

SUMMARY OF RESEARCH

The research questions presented in Chapter One have been addressed through the analysis presented in Chapter Five. Despite the limitations imposed by the use of survey records, unmistakable trends are present in this analysis. The settlement pattern data have illustrated clearly that there was a significant increase in the sizes of sites between the Late Archaic and Late Pit Structure periods and an expansion of sites into previously little-used areas, signifying substantial growth in the population of the San Simon Valley. From the small, sometimes ephemeral, sites of the Archaic period to the large village sites of the Late Pit Structure period with their higher density and diversity of artifacts, the material evidence makes a case for rising population pressure. As noted in Chapter One, this is not merely a local phenomenon, but a regional one as well, with populations growing in the nearby Mogollon and Hohokam areas during the same period, and expansion of population in the Southwest United States as a whole.

In the increasingly circumscribed San Simon River Basin, with population continuing to expand from nearby areas, competition for resources would have led to fewer large game choices, intensification of agricultural strategies, and expansion into marginally productive areas. As time went on, agricultural lands could have been unfavorably impacted, and riparian zones may also have been affected by both the cultivation of crops and the gathering of wood for heat, cooking, and ceramic manufacture. Climate change may have played a role as well. It is likely that during the Pit Structure period, people found it necessary or even advantageous to engage in a mixed strategy of using both wild and cultivated plants as well as small game.

The anthropogenic impact of growing population with expansion into less favorable areas of the region is not measurable using the data at hand, but it is implied by the fact that the formation of large villages in the San Simon Basin during the Pit Structure period was followed by the area's near abandonment in subsequent periods. Although other factors such as climate change, conflict, or other social and economic considerations may have played a role, the implied growth in population and increasing use of agricultural practices are likely contributing, if not causal, factors in the subsequent de-population of the area.

An increase in sedentism and reliance on agriculture probably occurred in a gradual fashion over the course of the Pit Structure period, rather than people becoming fully settled earlier, at the beginning of the Pit Structure period. The completion of the transition to sedentary lifestyles and dependence on agriculture, as suggested by Gilman (1995), likely only occurred with a move to areas more favorable for irrigation agriculture and a change to above-ground structures. The Pit Structure period in the San Simon Basin set the stage for these changes.

The landscape of the basin both provided necessary resources and set limitations on the economic possibilities for those who lived there. People used and shaped the land to meet their needs and it is the interaction between the natural environment and its human inhabitants that led first to a dramatic increase in population, and later possibly to the abandonment of the basin as shown in this analysis. Succeeding perhaps too well, the basin's inhabitants may have irreversibly altered the productive capabilities of the lands they occupied, causing them to seek new opportunities elsewhere.

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APPENDIX A – TABLE OF SURVEY DATA

Site No. ASM	Site No. Other	Site Size (m2)	Elevation (feet)	Site Type	Time Period	Projectile Points	Ground Stone	Ceramics	Architecture
CC:10:49	SS1	64000	3880	artifact scatter	6,7		Y	1,6	N
CC:10:50	SS2	36	3880	field-house	7		Y	1,2,8	S
CC:10:18	SS3 BLM AR-02-04-180	60000	3860	habitation	6		Y	1,2,3,4,5	P
CC:10:51	SS4	92400	3880	artifact scatter	3,4	2	Y	1	N
CC:10:52	SS5	7200	3860	habitation	6		Y	1,2,4,5	N
CC:10:53	SS6	1050	3860	field-houses	3	2	Y	0	S
CC:10:54	SS7	26000	3986	lithic scatter	1		Y	0	N
CC:10:55	SS8	7	3930	rock feature	1		N	0	N
CC:10:56	SS9	10400	3900	possible field-house	3,4	2	Y	1	S
CC:10:82	SS10	70000	4302	rock feature	1		N	0	S
CC:10:57	SS11	2116	3810	rock feature, lithic scatter	1		Y	0	N
CC:10:58	SS12	12150	3800	artifact scatter	6		Y	1,5	N
CC:10:59	SS13	60225	3780	field house	7		Y	1,5,6	S
CC:10:60	SS14	4635	3840	field houses, rock feature	7		N	1,3,5,8	S
CC:10:61	SS15	37440	3760	field houses	7		Y	1,4,5,6	S
CC:10:62	SS16	96000	4200	habitation	6	3	Y	1,2,4,5,8	P
CC:10:63	SS17	23	3770	artifact scatter	6,7		N	5,6	N
CC:10:64	SS18	40608	3690	habitation	6		Y	1,2,4,5,8	P
CC:10:65	SS19	5610	3780	field-house	7	3	Y	1,4,5,6	S

CC:10:66	SS20 GPC:10:4 CC:10:3 A.R.116	11880	3720	artifact scatter	3,4	2	Y	1	N
CC:10:67	SS21	3375	4100	artifact scatter	6		Y	1,5	N
CC:10:68	SS22	3500	4160	rock features	4		N	1,2	N
CC:10:69	SS23	7084	4100	lithic scatter	1		N	0	N
CC:10:70	SS24	4550	4260	rock feature, artifact scatter	3,4	2	Y	1	N
CC:10:71	SS25	6500	4180	artifact scatter	4		Y	1	N
CC:10:73	D&M #6	3000	4160	artifact scatter	6,7	3	Y	1,4,5,6	N
CC:10:75	D&M #8	540	4070	artifact scatter	6	3	N	1,2,4,5,8	N
CC:10:83	BLM CC:10:13	30000	3620	habitation	5,6	2	Y	1,2,3,4,5,8	P
CC:10:84	BLM CC:10:15	8960	3630	artifact scatter	2		Y	1,2,4	N
CC:11:50	SS26	6438	3560	artifact scatter	3	2	Y	0	N
CC:11:51	SS27	8217	3485	artifact scatter	8	2	Y	0	N
CC:11:52	SS28	7128	3465	habitation	7		Y	1,4,5,6	S
CC:7:13	SS29	2244	3340	features, artifact scatter	4		Y	1	N
CC:7:14	SS36	2625	3490	artifact scatter	5,6,7		Y	1,2,4,5,6	N
CC:7:15	SS37	2832	3490	features, artifact scatter	4		Y	1	N
CC:7:16	SS38	20174	3490	habitation	5,6,7		Y	1,2,4,5,6	P
CC:7:17	SS39	34480	3490	artifact scatter	5,6,7		Y	1,4,5,6	N
CC:7:18	SS40	196875	3615	rock features, bedrock mortars	8		Y	1,2,3,4,6,8	S
CC:7:19	SS41	12500	3818	habitation	1		N	0	S
CC:7:20	SS42	10212	3530	features, artifact scatter	4		Y	1,2,8	N
CC:7:21	SS43	7650	3550	features, artifact scatter	4		Y	1	N
CC:7:22	SS44	3760	3581	rock features, artifact scatter	1		Y	0	N

CC:7:23	SS45	300	3430	artifact scatter	4		Y	1	N
CC:7:24	SS46	37800	3530	habitation	6	3	Y	1,2,5,8	N
CC:7:25	SS47	32665	3540	Pre-hx and hx structures	6,7,8	3	Y	1,2,4,6	S
CC:7:26	SS48	9750	3510	features, artifact scatter	4		Y	1,2	P
CC:7:27	SS49	41406	3440	artifact scatter	6		Y	1,4,5	N
CC:7:28	SS50	8910	3530	artifact scatter	1		Y	0	N
CC:7:29	SS51	52190	3510	artifact scatter	4		Y	1	N
CC:7:3		221100	3482	habitation	6,7	3	Y	1,2,3,4,5,6	P
CC:7:4	(BLM) CC:7:63	158500	3520	habitation	6,7	3	Y	1,2,3,4,5,6, 8	P
CC:7:11		40425	3463	artifact scatter	3,6		Y	1,2,5	N
	FS125 (AR03-05-04-125)	5625	4310	artifact scatter	1		N	8	N
	SS30 AR-03-05-04-169	2754	4440	artifact scatter	8		Y	1,4,5,6,8	N
	SS31 FS170	12075	4460	habitation	6,7	3	Y	1,2,3,4,5,6	P
	SS32 FS171	3000	4510	artifact scatter	3,6,7	2,3	Y	1,2,3,4,5,6, 8	P
	SS33 FS172	2025	4530	artifact scatter	6,7		Y	1,3,4,5,8	N
	SS34 FS173	2120	4510	artifact scatter	6,7		Y	1,4,5,8	P
	SS35 FS174	800	4610	artifact scatter	6,7	3	N	1,5,6,8	N
	FS 127 AR-03-05-04-127	600	4430	artifact scatter	4		Y	1	N
	FS 128 AR-03-05-04-128	600	4520	artifact scatter	1		N	1,4	N
	FS129 AR-03-05-04-129	400	4540	artifact scatter	4		N	1	N
	FS130 AR03-05-04-130	400	4500	artifact scatter	4		N	1	N
	FS22 AR03-05-04-22	7150	4460	habitation	2,3,6,7	1,2	Y	1,3,5,6,8	P
	FS23 AR03-05-04-23, (BLM) AR689	120000	4360	habitation	2,6	1,3	Y	1,3,4,5,8	P
	FS126	10000	4360	rock feature, artifact scatter	4		Y	1	N

CC:7:30	SS52	350	3519	artifact scatter	1	3	Y	6	N
CC:7:31	SS53	2400	3510	artifact scatter	1		Y	1,2,6,8	N
CC:7:32	SS70	14000	3340	lithic scatter	2,3	1,2	Y	0	N
CC:7:33	SS71	5625	3350	artifact scatter	6,7	3	Y	1,3,4,5,8	N
CC:7:34	SS72	7150	3300	artifact scatter	6,7		Y	3,4,5,6,8	N
CC:7:35	SS73	7225	3300	lithic scatter	4,8	3	Y	1,2,8	N
CC:6:22	SS74	6000	3290	artifact scatter	4		N	1	N
CC:6:23	SS75	15950	3290	artifact scatter	4	3	Y	1	N
CC:6:24	SS76	9975	3289	artifact scatter	4	3	Y	1,2,8	N
CC:6:25	SS77	1540	3255	artifact scatter	6		Y	3,8	N
CC:6:27	SS79	179200	3260	artifact scatter	6,7		Y	5,6,8	N
CC:7:38	SS83	17600	3360	artifact scatter	7,8		Y	1,2,6,8	N
CC:6:29	CC:6:13	265540	3250	artifact scatter	4,5,8		Y	1,2,3,8	N
	(BLM) CC:7:1			sherd scatter	5,6		N	1,2,4,5	N
CC:7:2	G.P. Ariz L:7:2-5			habitation	1		N	5	N
CC:7:5	(BLM)			sherd scatter	7,8	3	N	1,3,5,6	N
CC:7:6		100		artifact scatter	7		Y	1,3,5,6,8	N
CC:7:7		13 mi2	4000	lithic scatter	1		N	0	N
CC:7:8		3000	4700	rock shelter	1		Y	1	N
CC:7:9	Amerind Found. (CC:7:1)			sherd scatter	6		N	4,5,8	N
CC:5:8 (and CC:7:11?)		400		artifact scatter	1		N	1	N
CC:7:12		6582	4550	cave/ artifact scatter	1		Y	0	N
	CC:7:5 (BLM)	40000		RS, lithic scatter, rock art, bedrock mortars	1		Y	0	N

	CC:7:6 (BLM), AR02-04-168	40000	3500	bedrock mortars, artifact scatter	1		Y	8	N
	CC:7:7 (BLM), AR02-04-171	100	4770	rock-shelter, lithic scatter	1		Y	0	N
	CC:7:8 (BLM)	2500		feature, artifact scatter	2	1,3	Y	0	N
	CC:7:9 (BLM)	2500		artifact scatter	6,7	3	Y	1,2,3,5,6	N
	CC:7:10 (BLM)	10000		habitation	1		Y	8	Y
	CC:7:11(BLM)	600	4100	habitation	1		Y	1,4	U
	(BLM) CC:7:21	9	3460	sherd scatter	7		N	1,6	N
	(BLM) CC:7:22	300	3460	sherd scatter	7		N	1,8	N
CC:7:68	(BLM) CC:7:23 and 780, TD#1	48400	3330	habitation	3,4,5,6,7,8	2,3	Y	1,2,3,4,5, 6,8	N
CC:7:69	(BLM) CC:7:24 and 781, TD#2	100000	3330	artifact scatter	6,7		N	1,2,4,5,6	N
CC:7:70	(BLM) CC:7:25 and 782, TD#3	39040	3220	habitation	4,5,6,7		Y	1,3,4,5,6,8	N
CC:7:71	(BLM) CC:7:26 and 783, TD#4	14076	3350	habitation	3,4,6,7,8	2,3	Y	1,2,3,5,6,7	N
CC:7:72	(BLM) CC:7:27 and 784, TD#5	396352	3330	habitation	4,5,6,7,8		Y	1,4,5,7,8	P
CC:7:73	(BLM) CC:7:28 and 785, TD#6	5848	3360	artifact scatter	4	3	Y	1	N
CC:7:74	(BLM) CC:7:29 and 786, TD#7	56700	3340	habitation	3,4		N	1,7	N
	(BLM) CC:6:84	900	3260	artifact scatter	6,7		N	1,2,3,4	N
	(BLM) CC:6:88	49	3250	lithic scatter	1		Y	0	N
	(BLM) CC:6:90	7	3091	rock feature	1		N	0	N
	(BLM) CC:6:91	400	3151	artifact scatter	4		N	1	N
	(BLM) CC:6:92	5000	3151	sherd scatter	4,8		N	1,2	N
	(BLM) CC:6:93	100	3151	artifact scatter	1	3	N	1	N

	(BLM) CC:6:94	2400	3150	rock feature, lithic scatter	1		Y	0	N
	(BLM) CC:6:95	1	3150	sherd scatter	4		N	1	N
	(BLM) CC:6:96	3976	3151	artifact scatter	4,6	3	N	1,2,8	N
	(BLM) CC:6:97	18200	3174	artifact scatter	4		Y	1	N
	(BLM) CC:6:98	20000	3174	feature, artifact scatter	6,8		Y	1,5,8	N
	(BLM) CC:6:99	17000	3200	features, artifact scatter	1	3	Y	1	N
	(BLM) CC:6:100	37500	3200	lithic scatter	1		Y	1	N
	(BLM) CC:6:101	321300	3200	artifact scatter	5,7		Y	1,5,6	N
	(BLM) CC:6:103		3155	lithic scatter	1		N	0	N
	(BLM) CC:6:104		3160	sherd scatter	1		N	1	N
	(BLM) CC:6:114	80000		artifact scatter	1		N	1,4,5,8	N
	(BLM) CC:6:116	30000	3145	artifact scatter	2,4,5	1	Y	1,3,4	N
CC:7:75	(BLM) CC:7:30 and 787, TD#8	3500	3340	sherd scatter	4		N	1,6	N
CC:7:76	(BLM) CC:7:31 and 788, TD#9	2640	3340	lithic scatter	1		Y	0	N
CC:7:77	(BLM) CC:7:33 and 789, TD#11	517871	3330	features, artifact scatter	3,4,5,6,7,8	2	Y	1,4,7	N
CC:7:78	(BLM) CC:7:34 and 790, TD#12	150060	3330	habitation	6,7	3	Y	1,3,4,5,6,7,8	N
CC:7:79	(BLM) CC:7:35, and 791, TD#13	3900	3350	artifact scatter	3,4	2	Y	1	N
CC:7:80	(BLM) CC:7:36 and 792, TD#14	14000	3340	rock feature, lithic scatter	1		N	0	N
CC:7:81	(BLM) CC:7:37 and 793, TD#15	1760	3340	artifact scatter	4	3	N	1	N
CC:7:82	(BLM) CC:7:38 and 794, TD#16	2250	3340	lithic scatter	3	2,3	Y	0	N
CC:7:83	(BLM) CC:7:39 and 795, TD#17	2730	3540	artifact scatter	4,6		Y	1,5	N

CC:6:54	(BLM) CC:6:54, TQ-1	13000	3280	habitation	1		Y	0	N
CC:6:55	(BLM) CC:6:55, TQ-2	12800	3260	rock feature, artifact scatter	6,7,8	3	Y	1,4,7	N
CC:6:56	(BLM) CC:6:56, TQ-3	900	3290	lithic scatter	1		N	0	N
CC:6:57	(BLM) CC:6:57, TQ-4	385000	3270	lithic scatter	1		N	0	N
CC:6:58	(BLM) CC:6:58, TQ-5	1000	3250	lithic scatter	1		Y	0	N
CC:6:59	(BLM) CC:6:59, TQ-6	1350	3250	artifact scatter	6		N	1,2,4,8	N
CC:6:62	(BLM) CC:6:62, TQ-9	150000	3250	artifact scatter	1		Y	1,2,4,8	N
CC:6:63	(BLM) CC:6:63, TQ-10	4275	3270	artifact scatter	6		N	1,2,4	N
CC:6:64	(BLM) CC	6750	3280	artifact scatter	1		N	1,2,5	N
CC:6:65	(BLM) CC:6:65, TQ-12	33000	3290	habitation	5,6		Y	1,2,5,8	U
CC:6:66	(BLM) CC:6:66, TQ-13	5850	3250	rock feature, lithic scatter	1		Y	0	U
CC:6:67	(BLM) CC:6:67, TQ-14	300000	3300	artifact scatter	1		N	1,2	N
CC:6:68	(BLM) CC:6:68, TQ-15	360	3250	lithic scatter	1		Y	0	N
CC:6:69	(BLM) CC:6:69, TQ-16	24650	3250	artifact scatter	4		Y	1	N
CC:6:70	(BLM) CC:6:70, TQ-17	13600	3250	artifact scatter	5,6		Y	1,2,5	N
CC:6:71	(BLM) CC:6:71, TQ-18	6300	3260	artifact scatter	3,4		Y	1	N
CC:6:72	(BLM) CC:6:72, TQ-19	5200	3260	artifact scatter	4		N	1	N
CC:6:73	(BLM) CC:6:73, TQ-20	720	3260	artifact scatter	5,6		N	1,2,5	N

CC:6:74	(BLM) CC:6:74, TQ-21	7200	3250	artifact scatter	4		N	1,2,8	N
CC:6:75	(BLM) CC:6:75, TQ-22	21850	3290	artifact scatter	6		N	1,2,4	N
CC:6:76	(BLM) CC:6:76, TQ-23	31250	3280	habitation	2,4	1,3	Y	1,2,8	N
CC:6:77	(BLM) CC:6:77, TQ-24	5000	3270	artifact scatter	6,7		Y	1,2,5,6	N
CC:6:18	(BLM) ?	3,000	4330	lithic scatter	1		N	0	N
CC:6:19	(BLM) ?	1152	4330	lithic scatter	1		N	0	N
CC:6:20		7020	4290	habitation	2,3	1,2, 3	Y	0	N
CC:6:21	AZ Land Dept.	408	4400	lithic scatter	1		Y	0	N
	CC:6:1 (ARS) State Land	25000	3300	artifact scatter	1	3	Y	1	N
	CC:6:2 (ARS) State Land	16000	3320	habitation	4		Y	1	P
	CC:6:3 (ARS) State Land	17000	3310	habitation	6,7		Y	1,5,6,8	S
	CC:6:4 (ARS) U.S. Prison Land	5425	3350	ceramic scatter	4		N	1	N
CC:2:2 and CC:2:67	private land	1356800	2940	habitation	6,7,8		Y	1,2,3,4,5,6, 7,8	S
CC:2:64	private & ADOT land	869000	2990	habitation	6,7,8		Y	1,2,3,5,6,7, 8	S
CC:2:235	mostly private land	280000	2900	habitation	8		Y	1,2,3,5,6,7, 8	U
CC:2:236	mostly private land	8000	2910	artifact scatter	4		N	1,2	N
CC:6:40	ADOT and private land	62600	3330	hx & pre-hx habitation	6,7,8		Y	1,2,4,5,8	U
CC:6:39	ADOT and private land	11970	3300	habitation	6,7		N	1,2,6	U
CC:6:42	ADOT and private land	82200	3220	pre-historic habitation + historic camp	6,7,8		Y	1,2,6	P,S
CC:6:43	ADOT and private land	263680	3180	habitation	7		Y	1,2,3,4,5,6, 8	N
	(BLM) CC:2:24	8296	2990	artifact scatter	1		Y	0	N

	(BLM) CC:2:25	49373	3060	rock features, lithic scatter	1		N	0	N
	(BLM) CC:2:26	4006	3000	agric.field, rock feature, lithics	1		N	0	N
	(BLM) CC:2:27	1200	3000	artifact scatter	1		N	1,5	U
CC:2:30 ?	(BLM) AZ-04-437 AR + AEPCO ET 604	90000	3090	habitation + agric	6		Y	1,2,3,5	P
ASM>>	(BLM) CC:2:32	1925	3120	rock features, artifact scatter	6,7		N	1,4,5,6,8	N
ASM>>	(BLM) CC:2:33, AEPCO 36,37	3675	3075	rock feature, lithic scatter	1		Y	0	N
ASM>>	(BLM) CC:2:34, AEPCO 38	1275	3006	lithic scatter	1		Y	0	N
	(BLM) CC:2:38, AEPCO 78	1200	3099	lithic scatter	1		N	0	N
	(BLM) CC:2:39, AEPCO 42	1645	3098	lithic scatter	1		N	0	N
	(BLM) CC:2:42, AEPCO 48, BLM AR 438	5936	3050	rock feature, lithic scatter	1		Y	0	N
	(BLM) CC:2:43, AEPCO 49, BLM AR 439	5400	3186	lithic scatter	1		N	0	N
CC:2:44	AEPCO 50, BLM AR 440	39000	3193	lithic scatter	1		N	0	N
CC:2:45	AEPCO 51, BLM AR 441	25800	3238	rock features, lithic scatter	1		N	0	N
CC:2:60	AEPCO 201, BLM AR 487	1	3066	feature	1		N	0	N
CC:2:105	SWCA	1200	3120	rock feature, lithic scatter	1		N	0	U
CC:2:106	SWCA	80	3190	rock features	1		N	0	N
CC:2:107	SWCA	8	3190	rock feature, 1 lithic	1		N	0	N
CC:2:108	SWCA	22	3175	rock features, 1 lithic	1		N	0	N
CC:2:109	SWCA	40	3160	lithic scatter	1		N	0	N

CC:2:110	SWCA	80	3160	artifact scatter	1		N	5	N
CC:2:111	SWCA	8	3190	rock features	1		N	0	N
CC:2:112	SWCA	3	3215	rock feature	1		N	0	N
CC:2:113	SWCA	40	3220	rock features	1		N	0	N
CC:2:114	SWCA	80	3220	rock features, lithic scatter	1		N	0	N
CC:2:115	SWCA	10	3215	rock features	1		N	0	N
CC:2:116	SWCA	3	?	rock feature	1		N	0	N
CC:2:117	SWCA	8	3210	rock features	1		N	0	N
CC:2:118	SWCA	1	3180	rock feature	1		N	0	N
CC:2:119	SWCA	155	3150	habitation?	1		N	0	S
	(BLM) CC:6:8, AR02-04-265 (265)	10000	?	artifact scatter	1		N	Y	N
	(BLM) CC:6:9, and 267	40000	?	rock-shelter, artifact scatter	1,7		Y	1,2,4,6	N
	(BLM) CC:6:10, and 287	10000		rock-shelter, lithic scatter	1		N	0	N
	(BLM) CC:6:11, and 301	16000	3190	artifact scatter	1		N	1,4,8	N
CC:7:84	(BLM) CC:7:41, and 796, TD#19	16625	3340	artifact scatter, hearths	1	3	Y	1	N
CC:7:85	(BLM) CC:7:42, and 797, TD#20	30820	3338	artifact scatter, hearths	3	2,3	Y	1	N
CC:7:86	(BLM) CC:7:43, and 798, TD#21	29415	3340	artifact scatter	2,3,4	1,2, 3	Y	1	N
CC:7:87	(BLM) CC:7:44, and 799, TD#22	32000	3330	artifact scatter, poss. hearth	2,3,4	1,2	Y	1	N
CC:7:88	(BLM) CC:7:45, and 800, TD#23	5000	3338	artifact scatter	2,3,4	1,2	Y	1	N
CC:7:89	(BLM) CC:7:46, and 801, TD#24	118064	3320	artifact scatter, hearths	3,4	2	Y	1	N

CC:7:90	(BLM) CC:7:47, and 802, TD#25	98596	3330	artifact scatter	4,5		Y	1,4,8	N
CC:7:91	(BLM) CC:7:48, and 803, TD#26	390000	3325	artifact scatter	4	3	Y	1,2	N
CC:7:92	(BLM) CC:7:49, and 804, TD#27	30000	3320	artifact scatter	3,4		Y	1,3	N
CC:7:93	(BLM) CC:7:50, and 805, TD#28	22500	3330	rock features, artifact scatter	4,6		Y	1,5	N
CC:7:97	(BLM) CC:7:51, and 806, TD-AA	900	3320	artifact scatter	4		N	1,2	N
	(BLM) CC:7:52, and 807, TD-BB	1.4	3340	rock feature	1		N	0	N
	(BLM) CC:7:53, and 808, TD-CC	20	3340	sherd scatter	8		N	7	N
	(BLM) CC:7:54, and 809, TD-DD	345	3340	lithic scatter	1		N	0	N
CC:7:98	(BLM) CC:7:55, and 810, TD-EE	3080	3330	artifact scatter	4		Y	1	N
	(BLM) CC:7:56, and 811, TD-FF	60	3340	sherd scatter	8		N	1,8	N
CC:7:99	(BLM) CC:7:57, and 812, TD-GG	10	3340	rock features	1		N	0	N
CC:7:100	(BLM) CC:7:58, and 813, TD-HH	2800	3330	sherd scatter	1,4		N	1	N
CC:7:101	(BLM) CC:7:59, and 814, TD-II	400	3330	rock features	1		N	0	N
	(BLM) CC:7:60, and 822	1	3900	lithic scatter	1		N	0	N
	(BLM) CC:7:61, and 998	140417	3640	habitation	6		Y	1,4,5	S
	(BLM) CC:7:62, and 999	6583	4550	caves, cliff dwellings	1		Y	8	N
	(BLM) CC:7:65	15000	4020	bedrock mortars, lithic scatter	1		Y	0	N

	(BLM) CC:7:68	36300	4200	rock-shelters, bedrock mortars, artifact scatter	6		Y	1,5,6	U
	(BLM) CC:7:69	1500	3790	rock-shelter, artifact scatter	1,8		Y	1,2,4,5,6,7, 8	N
	(BLM) CC:7:70	?	4150	artifact scatter, bedrock mortars	4		Y	1,2	N
CC:9:16		2500	4210	artifact scatter	4		N	1	N
CC:10:1	(BLM) AR02-04-129	135000	?	habitation	6,7	3	Y	1,4,5,8	P
CC:10:2 (ASM or BLM?) both listed	(BLM) AR02-04-115, GP L:10:3	4000	3800	habitation	1		Y	0	P
(BLM or ASM?) CC:10:3(a	(BLM) AR02-04-116, GP L:10:4	1,200 0r 360,000?	3740	mounds	6		Y	1,4,5	U
CC:10:3(b)	(BLM) AR02-04-131, TGE 5	13000	4200	artifact scatter, habitation?	6		Y	1,2,3,4,5	U
?>>	(BLM) CC:10:4	?	3577	artifact scatter, habitation?	1		N	8	U
CC:10:5		40300	4050	habitation	5,6		Y	1,2,3,4,5,8	P
CC:10:6	AEPCO 208	7680	4455	lithic scatter	1		Y	0	N
CC:10:7	(BLM) AR02-04-495, AEPCO 209	3060	4460	bedrock mortars, artifact scatter	4		Y	1	N
	(BLM) CC	20000	3980	artifact scatter	1	3	Y	3,5	N
CC:10:8	(BLM) A2-04-496, AEPCO 211	9568	4413	lithic scatter	1		Y	0	N
CC:10:9	(BLM) A2-04-497, AEPCO 212	4644	4416	lithic scatter, quarry	1		N	0	N
CC:10:10	AEPCO 213	7380	4432	lithic scatter	1		N	0	N
CC:10:11	AEPCO 214	51720	4394	lithic scatter, quarry	1		Y	0	N
CC:10:12	AEPCO 216	11580	4438	lithic scatter	1		N	0	N
CC:10:13	AEPCO 217	10680	4435	lithic scatter	1		N	0	N
CC:10:14	AEPCO 218	22440	4439	lithic scatter	1		N	0	N

CC:10:15	AEPCO 219	35340	4456	artifact scatter	4		N	1	N
CC:10:16	CXC-1	4800	4250	artifact scatter	1	3	Y	1,2,4	N
CC:10:17	(BLM) AR 896, CXC-3	18000	3840	artifact scatter	4		Y	1	N
	(BLM) CC:10:14	2500	3620	artifact scatter	1		Y	0	N
CC:10:21	AAP 108-1	67056	4475	habitation	6		Y	4,5,8	P
CC:10:22	AAP 108-2	930	4520	lithic scatter	1		N	0	N
CC:10:23	AAP 108-3	4680	4420	habitation	7		Y	5,6	S
CC:10:24	AAP 108-4	1664	4440	artifact scatter	4		Y	1	N
CC:10:25	AAP 108-5	238496	4380	artifact scatter	1		Y	1,4,5	N
CC:10:26	AAP 108-6	3840	4470	artifact scatter, rock features	1	3	Y	1,8	N
CC:10:27	AAP 108-7	43200	4480	artifact scatter	1		Y	1,8	N
CC:10:28	AAP 108-8	5040	4480	artifact scatter	4		Y	1	N
CC:10:29	AAP 108-9	2100	4440	rock features, artifact scatter	6	3	Y	1,4,5	N
CC:10:30	AAP 108-10	2108	4450	artifact scatter	1		Y	1,5	N
CC:10:31	AAP 109-1	2025	4320	lithic scatter	1		N	0	N
CC:10:32	AAP 109-6	3900	4250	artifact scatter	4		N	0	N
CC:10:33	AAP 109-7	16128	4320	rock features, artifact scatter	6		Y	1,4,5	N
CC:10:34	AAP 109-8	65600	4400	lithic scatter	1		N	0	N
CC:10:35	AAP 110-2	?	?	artifact scatter	4		N	1	N
CC:10:37	AAP 110-4	32000	3900	habitation	8		N	8	N
CC:10:38	AAP 110-5	6600	3900	artifact scatter	1		Y	1,4	N
CC:10:39	AAP 110-6	8240	3900	habitation	8		Y	8	S
CC:10:40	AAP 110-7	4150	3830	artifact scatter	1		Y	1,4,5	N

CC:10:41	AAP 110-8	10400	3830	features, artifact scatter	4		Y	1,2,8	N
CC:10:43	AAP 110-10	82800	3850	historic habitation, pre-hx artifact scatter	4,8		Y	1,8	S
CC:10:44	AAP 110-11	17010	3895	artifact scatter	4,8		N	1,8	N
** prob. wrong # CC:10:45	AAP 110-12	105000	3830	habitation	6		Y	1,4,5	P
CC:10:78	(prev) CC:10:45 (ASM), JSB 8-9	16	4100	lithic scatter	1		N	0	N
CC:10:47	JSB 8-1	1600	4040	ceramic scatter	4		N	1	N
CC:10:72	D&M 5	600	4190	artifact scatter	4		N	1	N
CC:10:74	D&M 7	6400	4060	lithic scatter	1		Y	0	N
CC:10:77	D&M 10	10000	3970	lithic scatter	1		N	0	N
CC:11:2	AR 133	2	?	habitation	7		N	1,2	S
CC:11:3		4047	?	feature, lithic scatter	2	1	Y	0	N
CC:11:4		2 acres	3420	artifact scatter	6		N	3,4,5	N
CC:11:5	Amerind CC:11:1, AR 136	?	?	artifact scatter	6,8		Y	1,3,4,5,7	N
CC:11:6	MH-1	625	3700	artifact scatter	4	3	N	1	N
CC:11:7	MH-2	2	3630	feature, artifact scatter	1		N	0	N
CC:11:8	MH-3	2200	3630	lithic scatter	1		N	0	N
CC:11:9	MH-4	4	3573	lithic scatter	1		N	0	N
CC:11:10	MH-5	400	3540	lithic scatter	1		N	0	N
CC:11:12	MH-7	50	3540	lithic scatter	1		N	0	N
CC:11:13	MH-8	80000	3500	artifact scatter	4		Y	1	N
CC:11:14	MH-9	1350	3460	lithic scatter	1		Y	0	N
CC:11:15	MH-10	2	3560	lithic scatter	1		N	0	N

CC:11:26	Anaconda #2	3600	3460	artifact scatter	5,6		Y	1,3,5,6	N
CC:11:27	Anaconda #1	14400	3480	artifact scatter	3,4		Y	1,2	N
CC:11:31	Petty-Ray Geo. 9-D	100	3500	lithic scatter	1		Y	0	N
CC:11:32	Petty-Ray Geo. 9-E	10000	3523	features, artifact scatter	1		Y	1	N
CC:11:33	Petty-Ray Geo 10-B	76	3430	ground-stone scatter	1		Y	0	N
CC:11:34	Petty-Ray Geo 10-A	707	3405	artifact scatter	4		Y	1	N
CC:11:36	GSA Res. #5	?	3470	features, lithic scatter	1		Y	0	N
CC:11:37	GSA Res. #4	900	3470	lithic scatter	3		Y	2	N
CC:11:38	GSA Res. #3	1400	3480	lithic scatter	1		Y	0	N
CC:11:39	GSA Res. #2	2400	3480	lithic scatter	1		Y	0	N
CC:11:40	GSA Res. #1	2100	3470	lithic scatter	1		Y	0	N
CC:11:41	Union Carbide #4	400	3470	artifact scatter	4		Y	1	N
CC:11:42	Union Carbide #3	1200	3500	lithic scatter	1		Y	0	N
CC:11:43	Union Carbide #2	780	2450	lithic scatter	1		Y	0	N
CC:11:44	Union Carbide #1	690	3460	lithic scatter	1		Y	0	N
CC:11:45	GSA Res. #6	600	3470	lithic scatter	1		Y	0	N
CC:11:16	MH-11, AR 542	60000	3660	artifact scatter	4		Y	1	N
CC:11:17	MH-12	1000	3820	artifact scatter	4		N	1,2	N
CC:11:25		40000		artifact scatter	6		Y	1,5	N
CC:11:29		484		hearth, artifact scatter	1		Y	0	N
CC:11:47	AAP 111-2	12000		artifact scatter	7		Y	1,6	N
CC:2:73		30000		rock features	4		N	1	N
	(BLM) CC:3:1	230		cave, picto-graphs, artifact scatter	1		N	5	N

CC:3:113		735		rock-shelter, bedrock mortars, artifact scatter	1		Y	0	S
CC:3:114		470		historic habitation, pre-hx lithic scatter	8		Y	0	S
CC:3:116		3720		rock-shelters, walls, artifact scatter	5,6,7		Y	1,5,6	S
CC:3:117		3680		rock-shelter, lithic scatter	3	2	Y	0	N
	(BLM) CC:3:2	4800		rock-shelter, artifact scatter, picto-graph	5,6	3	N	1,4,5,8	N
	(BLM) CC:3:3	10000		historic habitation & pre-hx ceramics, rock-shelters	8		N	8	S
CC:5:14		6		petro-glyphs	1		N	0	N
	(BLM) CC:6:37	5626		lithic scatter, rock features	1		Y	0	N
CC:1:21		6000	3100	historic trash, pre-hx feature, artifacts	7,8		Y	2,3,6,8	S
CC:10:101		250		artifact scatter	4		N	1,6,8	N
CC:10:102		11700		pre-hx lithic scatter and historic features	1		Y	0	N
CC:10:104		1800		lithic scatter	1		Y	0	N
CC:10:105		1300		lithic scatter	1		Y	0	N
CC:10:99		1350		artifact scatter	4		Y	1	N
	(BLM) CC:2:37	15000		agric.& rock features	1		N	0	N
	(BLM) CC:2:41	33000		agric features, artifact scatter	7		Y	6	N
CC:2:46	AEPCO ?	73500	3348	rock features, lithic scatter	1		N	0	N
CC:2:138		400		rock features, lithic scatter	1		N	0	N
CC:2:139		100	3180	rock feature, lithic scatter	1		N	0	N

CC:2:133				agric. & rock features	1		N	0	N
CC:2:137				rock features, artifact scatter	7,8		N	1,2,4,5,6,8	N
CC:2:15	(BLM) CC:2:20, and (ASM) CC:2:70			habitation	8	3	Y	1,2,3,5,6,7, 8	S
CC:2:16				rock feature, artifact scatter	6,7,8	3	N	3,4,5,7	S
CC:2:18				rock features, lithic scatter	1		Y	0	N
CC:2:20		5000		rock features, lithic scatter	1		N	0	N
CC:2:21		2500		rock feature, lithic scatter	1		N	0	N
CC:2:22				rock feature, artifact scatter	4		Y	1	N
CC:2:23		750		rock feature, lithic scatter	1		N	0	N
CC:2:28				rock feature, lithic scatter	1		N	0	N
CC:2:35	AEPCO 39	7500		rock feature, lithic scatter	1		N	0	N
CC:2:36	AEPCO 40	70		rock feature, lithic scatter	1		N	0	N
CC:2:2 and CC:2:67		1015833		habitation			Y	Y	Y
CC:2:4 and CC:2:31	(BLM) AR-721	330000		habitation	7,8		N	5,7	U
CC:2:5		37500		habitation	1		Y	0	S
CC:2:6		300		habitation	1		N	0	S
CC:2:8		625		habitation	1		Y	0	S
CC:2:9				habitation	1		N	8	S
CC:2:40	AEPCO 43, 44, 45	11880		rock features, artifact scatter	4		N	1	N
CC:2:65				habitation	1		N	0	S
CC:2:68				unclear	1		N	0	N
CC:2:69				habitation	1		N	0	N
CC:2:72		75000		rock features, lithic scatter	1		N	0	N

CC:10:96		25000		artifact scatter	1		Y	5	N
CC:11:64		45500		rock features, artifact scatter	3	2	Y	1	N
CC:11:66	includes CC:11:2 (BLM)	90000		artifact scatter	8		Y	1	N
CC:2:101				habitation	8		N	7	S
CC:2:103			3200	habitation	7,8		N	1,2,3,4,6,8	S
CC:2:29		2		rock feature	1		N	0	N
CC:2:47	AEPCO 53	49800		rock feature, lithic scatter	1		Y	0	N
CC:2:49	AEPCO 55			artifact scatter	1		Y	6	N
CC:5:20		8670		artifact scatter	1		N	1,2,5,8	N
CC:6:48		9000		rock features, lithic scatter	1		N	0	N
CC:6:49		8400		rock features, lithic scatter	1		Y	0	N
CC:6:50		14400		artifact scatter	6		N	1,2,8	N
CC:6:52		9		rock feature, lithic scatter	1		N	0	N
	NA16812 (MNA)	40000		habitation	1		Y	8	S
CC:10:100				lithic scatter	3	2	Y	0	N
CC:11:62		16650		artifact scatter - historic & pre-historic	8		N	1,2,7,8	N
CC:12:3 and CC:12:48		235000		habitation	3,5,6,7	2	Y	1,5,6	U
CC:2:126				rock features, artifact scatter	1		N	1	N
CC:2:128				rock features, artifact scatter	7		N	6	N
	(BLM) CC:2:28	5000		rock features, lithic scatter	1		N	0	N
	(BLM) CC:2:29	9700		rock features, artifact scatter	4		N	1	N
	(BLM) CC:2:30			agric features & artifact scatter	4		N	1	N

	(BLM) CC:2:31	2500		agric features & lithic scatter	1		N	0	N
CC:2:262	AZ96-003	2000		rock features, lithic scatter	8		N	0	N
CC:2:295				rock features, lithic scatter	1		N	0	N
	(BLM) CC:3:44	40		rock-shelter, artifact scatter	4		Y	1	N
	(BLM) CC:3:45	20000		lithic scatter	1		N	0	N
	(BLM) CC:3:46	25		rock art, bedrock mortar	1		N	0	N
	(BLM) CC:3:47	750		artifact scatter	6		Y	1,2,4,8	N
	(BLM) CC:3:48	10000		habitation	6,7	3	Y	1,4,5,6	N
CC:3:68				bedrock mortars	1		N	0	N
	(BLM) CC:4:19	2520		rock features, lithic scatter	3	2	N	0	N
	(BLM) CC:7:11	600		habitation	4		Y	1	P
	(BLM) CC:7:13	10		lithic scatter	1		N	0	N
CC:10:86		1140		lithic scatter	1		N	0	N
CC:11:53		167750		feature, artifact scatter	1		Y	0	N
CC:6:13 & CC:6:15	(four separate records)	262500		habitation	7		Y	1,6,8	N
CC:6:82		70000		agric. features, artifact scatter	4		N	1	N
CC:6:83		2450		artifact scatter	4		N	1,6	N
CC:7:40	(BLM) CC:7:73	400	3365	lithic scatter	1		Y	0	N
CC:7:42	(BLM) CC:7:75	45		sherd scatter	6,7		N	5,8	N
CC:7:43	(BLM) CC:7:76	225		lithic scatter	1		Y	0	N
CC:7:44	(BLM) CC:7:77	192	3390	artifact scatter	1		N	8	N
CC:7:45	(BLM) CC:7:78	9750	3300	feature, lithic scatter	1		Y	0	N
CC:7:46	(BLM) CC:7:79	2	3440	rock feature, lithic scatter	1		N	0	N

CC:7:47	(BLM) CC:7:80	1800	3400	habitation	4,5		Y	5	P
CC:7:48	(BLM) CC:7:81	60	3440	artifact scatter	1		Y	8	N
CC:7:50	(BLM) CC:7:83	600	3437	rock feature, artifact scatter	4		N	1	N
CC:7:51	(BLM) CC:7:84	556		rock feature, artifact scatter	4		Y	1	N
CC:7:52	(BLM) CC:7:85	25600		rock feature, lithic scatter	1		Y	2	N
CC:7:55	(BLM) CC:7:88	200		artifact scatter	6,7		N	1,2,3,4,5	N
	(BLM) CC:7:67	1800		artifact scatter	1		N	0	N
CC:1:38		140000		habitation	8		Y	1,2,5,6,7,8	P,S
CC:10:117		6750		lithic scatter	1		Y	0	N
CC:10:80	AAP 109-3	25		lithic scatter	1		N	0	N
CC:10:97		2912		rock feature, artifact scatter	7	3	Y	1,3,5,6,8	U
CC:11:12		10000		rock feature, artifact scatter	4		Y	1	N
CC:11:57				habitation	5		Y	5	P
	(BLM) CC:11:9	16600		lithic scatter	1		N	0	N
CC:2:129				rock feature, lithic scatter	1		N	0	N
CC:2:19				feature, lithic scatter	1		N	0	N
CC:2:292	comb.w/ CC:2:32	3884		habitation	6,7,8		Y	2,4,5,6,8	P
CC:2:31	AEPCO 56	32820		habitation	6,7,8		Y	1,2,3,5,6,7, 8	N
CC:2:79				rock features	1		N	0	N
CC:2:95		2	3145	rock features	1		N	0	N
CC:3:76		11552		bedrock mortar, artifact scatter	2,6	1	Y	1,5,8	N
CC:3:77		1800		artifact scatter	6	3	N	1,5	N
CC:6:7		38400		habitation	2	1	N	1,2,6	P

	(BLM) CC:10:9, NA16707 (MNA)	1200		artifact scatter	1		N	8	N
CC:11:30		400		habitation	8		Y	1,7	S
	(BLM) CC:11:6	100		artifact scatter	1		Y	0	N
	(BLM) CC:11:7	100		artifact scatter	1		Y	1	N
	(BLM) CC:11:8	252000		artifact scatter	1		Y	1	N
CC:2:102				habitation	6,7,8		N	1,2,4,5,6, 7,8	S
CC:2:104				habitation	7,8		N	1,2,4,6,7	S
CC:2:130				rock features, lithic scatter	1		Y	0	N
CC:2:267		5200		rock features, lithic scatter	1		Y	0	N
	(BLM) CC:2:36	5525		habitation	6		N	1,3,5,8	N
CC:2:48	CC:2:294 (given in error), AEPCO 54			artifact scatter	6,7		N	1,3,5,6	N
CC:2:50	AEPCO 57	74175		artifact scatter	1		N	3	N
CC:2:94		10	3145	rock features	1		N	0	N
CC:2:97		5		rock features	1		N	0	N
	(BLM) CC:3:15	7500		artifact scatter	1		N	5	N
	(BLM) CC:3:16	10000		lithic scatter	1		Y	0	N
	(BLM) CC:3:29	4500		habitation	6	3	Y	1,5	S
CC:2:51	AEPCO 58	23400		rock features, lithic scatter	1		N	0	N
CC:2:52	AEPCO 59	10830		rock features, lithic scatter	1		N	0	N
CC:2:53	AEPCO 60	3810		lithic scatter	1		N	0	N
CC:2:54	AEPCO 61, 62			lithic scatter	1		N	0	N
	(BLM) CC:2:54	2304		rock feature, lithic scatter	1		N	0	N
CC:2:55	AEPCO 63	10		lithic scatter	1		N	0	N

CC:2:56	AEPCO 64	30885		lithic scatter	1		N	0	N
CC:2:57	AEPCO 65	5198		lithic scatter	1		N	0	N
	(BLM) CC:2:58	400000		rock feature, artifact scatter	8		Y	7,8	N
	(BLM) CC:2:65	35000		agric. features, rock features	1		N	0	S
	(BLM) CC:3:22	16000		lithic scatter	1		N	0	N
CC:6:30				bedrock mortars	1		N	0	N
CC:6:6		62400		habitation	2	1,3	Y	1	U
CC:7:58	(BLM) CC:7:91	200		rock feature, artifact scatter	4		Y	1,4	N
CC:7:65				habitation	8		N	0	S
CC:8:23		27378		rock features, lithic scatter	2	1,3	Y	0	N
	(BLM) CC:1:13	6600		rock features, artifact scatter	8		N	1,7	N
CC:1:22		400	3050	habitation	6		N	1,3,5,8	U
CC:10:79	AAP 109-2	19250		artifact scatter	8		Y	1,8	N
CC:11:54		200		rock feature, lithic scatter	1		N	0	N
CC:2:100				habitation	8		N	1,6,7,8	S
CC:2:127				agric features	1		N	8	S
CC:2:17				rock features, artifact scatter	6,7		N	4,6,8	N
	(BLM) CC:2:35	300		rock feature, artifact scatter	1		N	6,8	N
	(BLM) CC:3:10	200		rock-shelter, bedrock mortars	1		N	0	N
	(BLM) CC:7:17	3,200, 000		lithic scatter	1		N	0	N
	(BLM) CC:7:18	450		rock features, lithic scatter	1		N	0	N
	(BLM) CC:7:19	48000		lithic scatter	1		N	0	N
	(BLM) CC:7:20	3600		rock features, lithic scatter	1		N	0	N

CC:7:39	(BLM) CC:7:72	95000	3380	artifact scatter	3,4	2	Y	1	N
CC:7:41	(BLM) CC:7:74	12840		lithic scatter	3	2	Y	0	N
CC:7:53	(BLM) CC:7:86	90		lithic scatter	4		Y	1	N
CC:7:56	(BLM) CC:7:89	18228	3420	rock features, lithic scatter	1		Y	0	N
CC:5:6	? listed together w/ CC:5:7			habitation	7,8		N	0	S
CC:5:7	? listed together w/ CC:5:6	18000		rock features, artifact scatter	7,8		N	1,6,7,8	N
	(BLM) CC:6:23			habitation	6,7		N	5,6,8	U
CC:7:49	(BLM) CC:7:82	2125		lithic scatter	3	2	Y	0	N
	(BLM) CC:11:19	180000		rock feature, lithic scatter	1		Y	0	N
	(BLM) CC:11:2	25		rock feature, artifact scatter	1		Y	8	N
	(BLM) CC:11:20	25		rock feature, lithic scatter	1		N	0	N
	(BLM) CC:11:5	100		rock feature, lithic scatter	1		N	0	N
CC:2:303		87500		rock feature, artifact scatter	1		Y	8	N
	(BLM) CC:7:1	10000		artifact scatter	5,6		N	1,2,3,5	N
	(BLM) CC:7:71	3000		lithic quarry, scatter	1		N	0	N
	(BLM) CC:7:92	15000		bedrock mortars, lithic scatter	1		Y	0	N
CC:2:37	AEPCO 41	5280		rock feature, lithic scatter	1		N	0	N
CC:2:41	AEPCO 46			artifact scatter	1		Y	1,2,5,6	N
	(BLM) CC:2:61	60000		lithic scatter	1		N	0	N
CC:2:76		7200		rock features, lithic scatter	1		N	0	N
CC:2:80		25	3135	rock features	1		N	0	N
CC:6:34		3100		lithic scatter	1		Y	0	N
CC:7:61		50600		rock feature, artifact scatter	3,4	2	Y	1,2,6	N

CC:8:24		34632		lithic scatter	1	3	Y	0	N
CC:10:87		93		artifact scatter	1		N	Y	N
CC:10:88		4028		lithic scatter	1		N	0	N
CC:10:89		690		lithic scatter	1		N	0	N
	(BLM) CC:11:10	5000		artifact scatter	7		Y	6	N
	(BLM) CC:11:11	1000		rock feature, artifact scatter	1		Y	1	N
	(BLM) CC:11:13	450		rock feature, lithic scatter	1		Y	0	N
	(BLM) CC:11:14	400		rock feature, artifact scatter	8		Y	1,7	N
	(BLM) CC:11:15	100		lithic scatter	3		Y	0	N
	(BLM) CC:11:16			lithic scatter	1		Y	0	N
	(BLM) CC:11:17	700		artifact scatter	4		Y	1	N
	(BLM) CC:11:18	300		lithic scatter	1		N	0	N
	(FS) AR03-05-04-216	624	4804	habitation	2,3,4	1,2	N	1	S
	(FS) AR03-05-04-217	19200	3800	habitation	6		Y	1,2,3,4,5,6	P
	(FS) AR03-05-04-218	86	3800	habitation	6		Y	1,8	P
	(FS) AR03-05-04-219	500000	3900	agric. features, artifact scatter	3,6,7,8	2,3	Y	1,2,5,6,8	S
CC:2:24		5		rock features	1		N	0	N
CC:2:25		250		rock features, lithic scatter	1		N	0	N
CC:2:26				rock feature, lithic scatter	1		N	0	N
CC:2:27				rock feature, lithic scatter	1		N	0	N
CC:2:33	AEPCO 36, 37	11550		rock features, lithic scatter	1		Y	0	N
CC:2:34	AEPCO 38	1275		lithic scatter	1		Y	0	N
CC:2:38	AEPCO 78			lithic scatter	1		N	0	N

CC:2:39		1645		lithic scatter	1		N	0	N
CC:2:42		5936		rock features, lithic scatter	1		Y	0	N
CC:2:43		5400		lithic scatter	1		N	0	N
	(BLM) CC:6:1 and GP L:6:1,2,3			habitation	5,6		Y	1,4,5	N
CC:6:5		280		lithic scatter	1		N	0	N
CC:6:121		800000		rock features, artifact scatter	1		Y	Y	N
CC:6:123		350000		rock features, artifact scatter	1		Y	Y	U
	(BLM) CC:3:11, HS02-04-241 BLM	250		rock features	1		N	0	N
CC:3:27	AZ-04-404 AR (BLM)	2002		rock feature, lithic scatter	1		N	0	N
CC:3:28		4030		rock feature, lithic scatter	1		N	0	N
CC:3:30	AZ-04-455 AR (BLM)	555		lithic scatter	1		N	0	N
CC:3:44	AZ-04-485 AR (BLM)			rock feature, lithic scatter	1		N	0	N
	(BLM) CC:7:6	40000		rock feature, artifact scatter	1		N	0	N
	(BLM) CC:10:15	10000		artifact scatter	1		N	Y	N
	(BLM) CC:8:3	194249		lithic scatter	1		Y	0	N
	(BLM) CC:11:12	10000		rock features, artifact scatter	1		Y	1	N
	(BLM) CC:7:66	40000		artifact scatter	1		Y	Y	N
CC:2:185	(BLM) CC:2:53			habitation	6,7		Y	1,5,8	S
CC:11:23	AR-549, MH-18	560		artifact scatter	1		Y	1,3	N
CC:11:24	AR-550, MH-9	120000		artifact scatter	1		Y	Y	N
CC:8:7	(BLM) CC:8:7			rock feature, lithic scatter	2	1	Y	0	N
	(BLM) CC:6:13	25		artifact scatter	8		Y	1,7,8	N

	(BLM) CC:6:30, AR-19-6	25		artifact scatter	1		Y	1	N
	(BLM) CC:6:31, AR-20-L			habitation	7		Y	1,4	S
	(BLM) CC:6:47, AZ-04-569 AR	5300		rock features, artifact scatter	8		N	2,6,8	N
	(BLM) CC:6:117	22400		features, artifact scatter	1	3	Y	1	N
CC:6:3		7380		lithic scatter	1		N	0	N
CC:6:4	AR-490, AEPCO 204	10		lithic scatter	1		N	0	N
CC:12:14				lithic scatter	1		Y	0	N
CC:12:15		100		rock features, artifact scatter	1		N	1,8	N
CC:12:17		100		rock features, artifact scatter	4		Y	1	N
CC:12:1		15000		artifact scatter	1		Y	Y	N
CC:12:19		27560		habitation	1	3	N	0	P
CC:12:12		40128		artifact scatter	1		Y	1	N
CC:11:11	AR-537, MH-6	168		lithic scatter	1		Y	0	N
CC:11:21		8		lithic scatter	1		Y	0	N
CC:11:22		20000		artifact scatter	1		Y	1,2,5	N

Key:

Time Period
1 = Unknown
2 = Middle Archaic
3 = Late Archaic
4 = Early Pit Structure
5 = Middle Pit Structure
6 = Late Pit Structure
7 = Surface Structure
8 = Post-A.D. 1150
9 = Historic

Projectile Points
1 = Middle Archaic
2 = Late Archaic
3 = Unidentified

Ground Stone
Y = Yes
N = No

Architecture
N = None noted
P = Pit structure
S = Surface structure
H = Historic
U = Unknown

Ceramics
1 = Plain wares
2 = Red wares
3 = Red/buff
4 = Red/brown
5 = Black/white
6 = Corrugated
7 = Polychromes
8 = Other
0 = None

APPENDIX B – TEMPORAL DATABASES

Archaic Period Sites

Site No. ASM	Site No. Other	Site Size m2	Elevation feet	Site Type	Time Period	Projectile Points	Ground stone	Ceramics	Architecture
CC:10:54	SS7	26000	3986	lithic scatter	1		Y	0	N
CC:10:55	SS8	7	3930	rock feature	1		N	0	N
CC:10:57	SS11	2116	3810	rock feature, lithic scatter	1		Y	0	N
CC:10:69	SS23	7084	4100	lithic scatter	1		N	0	N
CC:11:50	SS26	6438	3560	artifact scatter	3	2	Y	0	N
CC:7:22	SS44	3760	3581	rock features, artifact scatter	1		Y	0	N
CC:7:28	SS50	8910	3530	artifact scatter	1		Y	0	N
CC:7:32	SS70	14000	3340	lithic scatter	2,3	1,2	Y	0	N
CC:7:12		6582	4550	cave/ artifact scatter	1		Y	0	N
	CC:7:5 (BLM)	40000		RS, lithic scatter, rock art, bedrock mortars	1		Y	0	N
	CC:7:7 (BLM), AR02-04-171	100	4770	rock-shelter, lithic scatter	1		Y	0	N
	CC:7:8 (BLM)	2500		feature, artifact scatter	2	1,3	Y	0	N
	(BLM) CC:6:88	49	3250	lithic scatter	1		Y	0	N
	(BLM) CC:6:90	7	3091	rock feature	1		N	0	N

	(BLM) CC:6:94	2400	3150	rock feature, lithic scatter	1		Y	0	N
	(BLM) CC:6:100	37500	3200	lithic scatter	1		Y	0	N
CC:7:76	(BLM) CC:7:31 and 788, TD#9	2640	3340	lithic scatter	1		Y	0	N
CC:7:80	(BLM) CC:7:36 and 792, TD#14	14000	3340	rock feature, lithic scatter	1		N	0	N
CC:7:82	(BLM) CC:7:38 and 794, TD#16	2250	3340	lithic scatter	3	2,3	Y	0	N
CC:6:54	(BLM) CC:6:54, TQ-1	13000	3280	habitation	1		Y	0	N
CC:6:56	(BLM) CC:6:56, TQ-3	900	3290	lithic scatter	1		N	0	N
CC:6:58	(BLM) CC:6:58, TQ-5	1000	3250	lithic scatter	1		Y	0	N
CC:6:66	(BLM) CC:6:66, TQ-13	5850	3250	rock feature, lithic scatter	1		Y	0	U
CC:6:68	(BLM) CC:6:68, TQ-15	360	3250	lithic scatter	1		Y	0	N
CC:6:18	(BLM) ?	3,000	4330	lithic scatter	1		N	0	N
CC:6:19	(BLM) ?	1152	4330	lithic scatter	1		N	0	N
CC:6:20		7020	4290	habitation	2,3	1,2,3	Y	0	N
CC:6:21	AZ Land Dept.	408	4400	lithic scatter	1		Y	0	N
ASM>>	(BLM) CC:2:33, AEPCO 36,37	3675	3075	rock feature, lithic scatter	1		Y	0	N
ASM>>	(BLM) CC:2:34, AEPCO 38	1275	3006	lithic scatter	1		Y	0	N
	(BLM) CC:2:39, AEPCO 42	1645	3098	lithic scatter	1		N	0	N

	(BLM) CC:2:42, AEPCO 48, BLM AR 438	5936	3050	rock feature, lithic scatter	1		Y	0	N
	(BLM) CC:6:10, and 287	10000		rock-shelter, lithic scatter	1		N	0	N
	(BLM) CC:7:52, and 807, TD-BB	1.4	3340	rock feature	1		N	0	N
	(BLM) CC:7:54, and 809, TD-DD	345	3340	lithic scatter	1		N	0	N
CC:7:99	(BLM) CC:7:57, and 812, TD-GG	10	3340	rock features	1		N	0	N
CC:7:101	(BLM) CC:7:59, and 814, TD-II	400	3330	rock features	1		N	0	N
	(BLM) CC:7:60, and 822	1	3900	lithic scatter	1		N	0	N
	(BLM) CC:7:65	15000	4020	bedrock mortars, lithic scatter	1		Y	0	N
CC:10:6	AEPCO 208	7680	4455	lithic scatter	1		Y	0	N
CC:10:8	(BLM) A2-04-496, AEPCO 211	9568	4413	lithic scatter	1		Y	0	N
CC:10:9	(BLM) A2-04-497, AEPCO 212	4644	4416	lithic scatter, quarry	1		N	0	N
CC:10:10	AEPCO 213	7380	4432	lithic scatter	1		N	0	N
CC:10:11	AEPCO 214	51720	4394	lithic scatter, quarry	1		Y	0	N
CC:10:12	AEPCO 216	11580	4438	lithic scatter	1		N	0	N
CC:10:13	AEPCO 217	10680	4435	lithic scatter	1		N	0	N
CC:10:14	AEPCO 218	22440	4439	lithic scatter	1		N	0	N
	(BLM) CC:10:14	2500	3620	artifact scatter	1		Y	0	N

CC:10:77	D&M 10	10000	3970	lithic scatter	1		N	0	N
CC:11:3		4047	?	feature, lithic scatter	2	1	Y	0	N
CC:11:7	MH-2	2	3630	feature, artifact scatter	1		N	0	N
CC:11:8	MH-3	2200	3630	lithic scatter	1		N	0	N
CC:11:9	MH-4	4	3573	lithic scatter	1		N	0	N
CC:11:10	MH-5	400	3540	lithic scatter	1		N	0	N
CC:11:12	MH-7	50	3540	lithic scatter	1		N	0	N
CC:11:15	MH-10	2	3560	lithic scatter	1		N	0	N
CC:11:31	Petty-Ray Geo. 9-D	100	3500	lithic scatter	1		Y	0	N
CC:11:33	Petty-Ray Geo 10-B	76	3430	ground-stone scatter	1		Y	0	N
CC:11:37	GSA Res. #4	900	3470	lithic scatter	3		Y	0	N
CC:11:38	GSA Res. #3	1400	3480	lithic scatter	1		Y	0	N
CC:11:39	GSA Res. #2	2400	3480	lithic scatter	1		Y	0	N
CC:11:40	GSA Res. #1	2100	3470	lithic scatter	1		Y	0	N
CC:11:42	Union Carbide #3	1200	3500	lithic scatter	1		Y	0	N
CC:11:43	Union Carbide #2	780	2450	lithic scatter	1		Y	0	N
CC:11:44	Union Carbide #1	690	3460	lithic scatter	1		Y	0	N
CC:11:45	GSA Res. #6	600	3470	lithic scatter	1		Y	0	N
CC:3:113		735		rock-shelter, bedrock mortars, artifact scatter	1		Y	0	N
CC:3:114		470		historic habitation, pre-hx lithic scatter	1,9		Y	0	H
CC:3:117		3680		rock-shelter, lithic scatter	3	2	Y	0	N

	(BLM) CC:6:37	5626		lithic scatter, rock features	1		Y	0	N
CC:10:102		11700		pre-hx lithic scatter and historic features	1		Y	0	N
CC:10:104		1800		lithic scatter	1		Y	0	N
CC:10:105		1300		lithic scatter	1		Y	0	N
CC:2:20		5000		rock features, lithic scatter	1		N	0	N
CC:2:21		2500		rock feature, lithic scatter	1		N	0	N
CC:2:23		750		rock feature, lithic scatter	1		N	0	N
CC:2:35	AEPCO 39	7500		rock feature, lithic scatter	1		N	0	N
CC:2:36	AEPCO 40	70		rock feature, lithic scatter	1		N	0	N
CC:2:72		75000		rock features, lithic scatter	1		N	0	N
CC:2:29		2		rock feature	1		N	0	N
CC:6:48		9000		rock features, lithic scatter	1		N	0	N
CC:6:49		8400		rock features, lithic scatter	1		Y	0	N
CC:6:52		9		rock feature, lithic scatter	1		N	0	N
	(BLM) CC:7:13	10		lithic scatter	1		N	0	N
CC:10:86		1140		lithic scatter	1		N	0	N
CC:7:40	(BLM) CC:7:73	400	3365	lithic scatter	1		Y	0	N
CC:7:43	(BLM) CC:7:76	225		lithic scatter	1		Y	0	N
CC:7:45	(BLM) CC:7:78	9750	3300	feature, lithic scatter	1		Y	0	N

CC:7:46	(BLM) CC:7:79	2	3440	rock feature, lithic scatter	1		N	0	N
	(BLM) CC:7:67	1800		artifact scatter	1		N	0	N
CC:10:117		6750		lithic scatter	1		Y	0	N
	(BLM) CC:11:9	16600		lithic scatter	1		N	0	N
	(BLM) CC:11:6	100		artifact scatter	1		Y	0	N
	(BLM) CC:3:16	10000		lithic scatter	1		Y	0	N
	(BLM) CC:3:22	16000		lithic scatter	1		N	0	N
	(BLM) CC:7:18	450		rock features, lithic scatter	1		N	0	N
	(BLM) CC:7:19	48000		lithic scatter	1		N	0	N
	(BLM) CC:7:20	3600		rock features, lithic scatter	1		N	0	N
CC:7:41	(BLM) CC:7:74	12840		lithic scatter	3	2	Y	0	N
CC:7:56	(BLM) CC:7:89	18228	3420	rock features, lithic scatter	1		Y	0	N
CC:7:49	(BLM) CC:7:82	2125		lithic scatter	3	2	Y	0	N
	(BLM) CC:11:20	25		rock feature, lithic scatter	1		N	0	N
	(BLM) CC:11:5	100		rock feature, lithic scatter	1		N	0	N
	(BLM) CC:7:92	15000		bedrock mortars, lithic scatter	1		Y	0	N
CC:2:37	AEPCO 41	5280		rock feature, lithic scatter	1		N	0	N
CC:6:34		3100		lithic scatter	1		Y	0	N
CC:8:24		34632		lithic scatter	1	3	Y	0	N
CC:10:88		4028		lithic scatter	1		N	0	N
CC:10:89		690		lithic scatter	1		N	0	N

	(BLM) CC:11:15	100		lithic scatter	3		Y	0	N
	(BLM) CC:11:18	300		lithic scatter	1		N	0	N
CC:2:24		5		rock features	1		N	0	N
CC:2:25		250		rock features, lithic scatter	1		N	0	N
CC:2:33	AEPCO 36, 37	11550		rock features, lithic scatter	1		Y	0	N
CC:2:34	AEPCO 38	1275		lithic scatter	1		Y	0	N
CC:6:5		280		lithic scatter	1		N	0	N
	(BLM) CC:3:11, HS02-04-241 BLM	250		rock features	1		N	0	N
CC:6:3		7380		lithic scatter	1		N	0	N
CC:6:4	AR-490, AEPCO 204	10		lithic scatter	1		N	0	N
CC:11:11	AR-537, MH-6	168		lithic scatter	1		Y	0	N
CC:11:21		8		lithic scatter	1		Y	0	N

Key:

Time Period
1 = None assigned
2 = Middle Archaic
3 = Late Archaic
4 = Early Pit Structure
5 = Middle Pit Structure
6 = Late Pit Structure
7 = Surface Structure
8 = Post-A.D. 1150
9 = Historic

Projectile Points
1 = Middle Archaic
2 = Late Archaic
3 = Unidentified

Ground Stone
Y = Yes
N = No

Architecture
N = None noted
P = Pit structure
S = Surface structure
H = Historic
U = Unknown

Ceramics
1 = Plain wares
2 = Red wares
3 = Red/buff
4 = Red/brown
5 = Black/white
6 = Corrugated
7 = Polychromes
8 = Other
0 = None

Early Pit Structure Period Sites

Site No. ASM	Site No. Other	Site Size m2	Elevation feet	Site Type	Time Period	Projectile Points	Ground stone	Ceramics	Architecture
CC:10:51	SS4	92400	3880	artifact scatter	3,4	2	Y	1	N
CC:10:66	SS20 GPC:10:4 CC:10:3 A.R.116	11880	3720	artifact scatter	3,4	2	Y	1	N
CC:10:68	SS22	3500	4160	rock features	4		N	1,2	N
CC:10:70	SS24	4550	4260	rock feature, artifact scatter	3,4	2	Y	1	N
CC:10:71	SS25	6500	4180	artifact scatter	4		Y	1	N
CC:7:13	SS29	2244	3340	features, artifact scatter	4		Y	1	N
CC:7:15	SS37	2832	3490	features, artifact scatter	4		Y	1	N
CC:7:20	SS42	10212	3530	features, artifact scatter	4		Y	1,2,8	N
CC:7:21	SS43	7650	3550	features, artifact scatter	4		Y	1	N
CC:7:23	SS45	300	3430	artifact scatter	4		Y	1	N
CC:7:26	SS48	9750	3510	features, artifact scatter	4		Y	1,2	P
CC:7:29	SS51	52190	3510	artifact scatter	4		Y	1	N
	FS 127 AR-03-05-04-127	600	4430	artifact scatter	4		Y	1	N
	FS129 AR-03-05-04-129	400	4540	artifact scatter	4		N	1	N
	FS130 AR03-05-04-130	400	4500	artifact scatter	4		N	1	N

	FS126	10000	4360	rock feature, artifact scatter	4		Y	1	N
CC:6:22	SS74	6000	3290	artifact scatter	4		N	1	N
CC:6:23	SS75	15950	3290	artifact scatter	4	3	Y	1	N
CC:7:8		3000	4700	rock shelter	1		Y	1	N
CC:5:8 (and CC:7:11?)		400		artifact scatter	1		N	1	N
CC:7:73	(BLM) CC:7:28 and 785, TD#6	5848	3360	artifact scatter	4	3	Y	1	N
	(BLM) CC:6:91	400	3151	artifact scatter	4		N	1	N
	(BLM) CC:6:92	5000	3151	sherd scatter	4,8		N	1,2	N
	(BLM) CC:6:93	100	3151	artifact scatter	1	3	N	1	N
	(BLM) CC:6:97	18200	3174	artifact scatter	4		Y	1	N
	(BLM) CC:6:99	17000	3200	features, artifact scatter	1	3	Y	1	N
CC:7:79	(BLM) CC:7:35, and 791, TD#13	3900	3350	artifact scatter	3,4	2	Y	1	N
CC:7:81	(BLM) CC:7:37 and 793, TD#15	1760	3340	artifact scatter	4	3	N	1	N
CC:6:69	(BLM) CC:6:69, TQ-16	24650	3250	artifact scatter	4		Y	1	N
CC:6:71	(BLM) CC:6:71, TQ-18	6300	3260	artifact scatter	3,4		Y	1	N
CC:6:72	(BLM) CC:6:72, TQ-19	5200	3260	artifact scatter	4		N	1	N
	CC:6:1 (ARS) State Land	25000	3300	artifact scatter	1	3	Y	1	N
	CC:6:2 (ARS) State Land	16000	3320	habitation	4		Y	1	P

	CC:6:4 (ARS) U.S. Prison Land	5425	3350	ceramic scatter	4		N	1	N
CC:7:84	(BLM) CC:7:41, and 796, TD#19	16625	3340	artifact scatter, hearths	1	3	Y	1	N
CC:7:85	(BLM) CC:7:42, and 797, TD#20	30820	3338	artifact scatter, hearths	3	2,3	Y	1	N
CC:7:86	(BLM) CC:7:43, and 798, TD#21	29415	3340	artifact scatter	2,3,4	1,2,3	Y	1	N
CC:7:87	(BLM) CC:7:44, and 799, TD#22	32000	3330	artifact scatter, poss. hearth	2,3,4	1,2	Y	1	N
CC:7:88	(BLM) CC:7:45, and 800, TD#23	5000	3338	artifact scatter	2,3,4	1,2	Y	1	N
CC:7:89	(BLM) CC:7:46, and 801, TD#24	118064	3320	artifact scatter, hearths	3,4	2	Y	1	N
CC:7:97	(BLM) CC:7:51, and 806, TD-AA	900	3320	artifact scatter	4		N	1,2	N
CC:7:98	(BLM) CC:7:55, and 810, TD-EE	3080	3330	artifact scatter	4		Y	1	N
CC:7:100	(BLM) CC:7:58, and 813, TD-HH	2800	3330	sherd scatter	1,4		N	1	N
CC:10:7	(BLM) AR02-04-495, AEPCO 209	3060	4460	bedrock mortars, artifact scatter	4		Y	1	N
CC:10:15	AEPCO 219	35340	4456	artifact scatter	4		N	1	N
CC:10:17	(BLM) AR 896, CXC-3	18000	3840	artifact scatter	4		Y	1	N

CC:10:43	AAP 110-10	82800	3850	historic habitation, pre-hx artifact scatter	4,9		Y	1,8	H
CC:10:44	AAP 110-11	17010	3895	artifact scatter	4,8		N	1,8	N
CC:10:47	JSB 8-1	1600	4040	ceramic scatter	4		N	1	N
CC:10:72	D&M 5	600	4190	artifact scatter	4		N	1	N
CC:11:6	MH-1	625	3700	artifact scatter	4	3	N	1	N
CC:11:13	MH-8	80000	3500	artifact scatter	4		Y	1	N
CC:11:27	Anaconda #1	14400	3480	artifact scatter	3,4		Y	1,2	N
CC:11:32	Petty-Ray Geo. 9-E	10000	3523	features, artifact scatter	1		Y	1	N
CC:11:34	Petty-Ray Geo 10-A	707	3405	artifact scatter	4		Y	1	N
CC:11:41	Union Carbide #4	400	3470	artifact scatter	4		Y	1	N
CC:11:16	MH-11, AR 542	60000	3660	artifact scatter	4		Y	1	N
CC:2:73		30000		rock features	4		N	1	N
CC:10:99		1350		artifact scatter	4		Y	1	N
CC:11:64		45500		rock features, artifact scatter	3	2	Y	1	N
CC:11:66	includes CC:11:2 (BLM)	90000		artifact scatter	1		Y	1	N
.	(BLM) CC:3:44	40		rock-shelter, artifact scatter	4		Y	1	N
	(BLM) CC:7:11	600		habitation	4		Y	1	P
CC:6:82		70000		agric. features, artifact scatter	4		N	1	N
CC:7:50	(BLM) CC:7:83	600	3437	rock feature, artifact scatter	4		N	1	N

CC:7:51	(BLM) CC:7:84	556		rock feature, artifact scatter	4		Y	1	N
CC:7:52	(BLM) CC:7:85	25600		rock feature, lithic scatter	1		Y	2	N
CC:11:12		10000		rock feature, artifact scatter	4		Y	1	N
	(BLM) CC:11:7	100		artifact scatter	1		Y	1	N
CC:6:6		62400		habitation	2,4	1,3	Y	1	N
CC:7:53	(BLM) CC:7:86	90		artifact scatter	4		Y	1	N
	(BLM) CC:11:11	1000		rock feature, artifact scatter	1		Y	1	N
	(BLM) CC:11:17	700		artifact scatter	4		Y	1	N
	(BLM) CC:11:12	10000		rock features, artifact scatter	1		Y	1	N
	(BLM) CC:6:30, AR-19-6	25		artifact scatter	1		Y	1	N
	(BLM) CC:6:117	22400		features, artifact scatter	1	3	Y	1	N
CC:12:17		100		rock features, artifact scatter	4		Y	1	N
CC:12:12		40128		artifact scatter	1		Y	1	N

Key:

Time Period
1 = None assigned
2 = Middle Archaic
3 = Late Archaic
4 = Early Pit Structure
5 = Middle Pit Structure
6 = Late Pit Structure
7 = Surface Structure
8 = Post-A.D. 1150
9 = Historic

Projectile Points
1 = Middle Archaic
2 = Late Archaic
3 = Unidentified

Ground Stone
Y = Yes
N = No

Architecture
N = None noted
H = Historic
P = Pit structure
U = Unknown
S = Surface structure

Ceramics
1 = Plain wares
2 = Red wares
3 = Red/buff
4 = Red/brown
5 = Black/white
6 = Corrugated
7 = Polychromes
8 = Other
0 = None

Middle and Late Pit Structure Period Sites

Site No. ASM	Site No. Other	Site Size m2	Elevation feet	Site Type	Time Period	Projectile Points	Ground stone	Ceramics	Architecture
CC:10:49	SS1	64000	3880	artifact scatter	6,7		Y	1,6	N
CC:10:18	SS3 BLM AR-02-04-180	60000	3860	habitation	6		Y	1,2,3,4,5	P
CC:10:52	SS5	7200	3860	habitation	6		Y	1,2,4,5	N
CC:10:58	SS12	12150	3800	artifact scatter	6		Y	1,5	N
CC:10:62	SS16	96000	4200	habitation	6	3	Y	1,2,4,5,8	P
CC:10:63	SS17	23	3770	artifact scatter	6,7		N	5,6	N
CC:10:64	SS18	40608	3690	habitation	6		Y	1,2,4,5,8	P
CC:10:67	SS21	3375	4100	artifact scatter	6		Y	1,5	N
CC:10:73		3000	4160	artifact scatter	6,7	3	Y	1,4,5,6	N
CC:10:75	D&M #8	540	4070	artifact scatter	6	3	N	1,2,4,5,8	N
CC:10:83	BLM CC:10:13	30000	3620	habitation	5,6	2	Y	1,2,3,4,5, 8	P
CC:7:14	SS36	2625	3490	artifact scatter	5,6,7		Y	1,2,4,5,6	N
CC:7:16	SS38	20174	3490	habitation	5,6,7		Y	1,2,4,5,6	P
CC:7:17	SS39	34480	3490	artifact scatter	5,6,7		Y	1,4,5,6	N
CC:7:3		221100	3482	habitation	6,7	3	Y	1,2,3,4,5, 6	P
CC:7:4	(BLM) CC:7:63	158500	3520	habitation	6,7	3	Y	1,2,3,4,5, 6,8	P
CC:7:11		40425	3463	artifact scatter	3,6		Y	1,2,5	N
	SS31 FS170	12075	4460	habitation	6,7	3	Y	1,2,3,4,5, 6	P
	SS32 FS171	3000	4510	artifact scatter	3,6,7	2,3	Y	1,2,3,4,5, 6,8	P
	SS33 FS172	2025	4530	artifact scatter	6,7		Y	1,3,4,5,8	N

	SS34 FS173	2120	4510	artifact scatter	6,7		Y	1,4,5,8	P
	SS35 FS174	800	4610	artifact scatter	6,7	3	N	1,5,6,8	N
	FS23 AR03-05-04-23, (BLM) AR689	120000	4360	habitation	2,6	1,3	Y	1,3,4,5,8	P
CC:7:33	SS71	5625	3350	artifact scatter	6,7	3	Y	1,3,4,5,8	N
CC:7:34	SS72	7150	3300	artifact scatter	6,7		Y	3,4,5,6,8	N
CC:6:25	SS77	1540	3255	artifact scatter	6		Y	3,8	N
CC:6:27	SS79	179200	3260	artifact scatter	6,7		Y	5,6,8	N
	CC:7:9 (BLM)	2500		artifact scatter	6,7	3	Y	1,2,3,5,6	N
	CC:7:11(BLM)	600	4100	habitation	1		Y	1,4	U
CC:7:69	(BLM) CC:7:24 and 781, TD#2	100000	3330	artifact scatter	6,7		N	1,2,4,5,6	N
	(BLM) CC:6:84	900	3260	artifact scatter	6,7		N	1,2,3,4	N
	(BLM) CC:6:96	3976	3151	artifact scatter	4,6	3	N	1,2,8	N
	(BLM) CC:6:98	20000	3174	feature, artifact scatter	6,8		Y	1,5,8	N
	(BLM)CC:6:101	321300	3200	artifact scatter	5,7		Y	1,5,6	N
CC:7:78	(BLM) CC:7:34 and 790, TD#12	150060	3330	habitation	6,7	3	Y	1,3,4,5,6,7,8	N
CC:7:83	(BLM) CC:7:39 and 795, TD#17	2730	3540	artifact scatter	4,6		Y	1,5	N
CC:6:59	(BLM) CC:6:59, TQ-6	1350	3250	artifact scatter	6		N	1,2,4,8	N
CC:6:62	(BLM) CC:6:62, TQ-9	150000	3250	artifact scatter	1		Y	1,2,4,8	N
CC:6:63	(BLM) CC:6:63, TQ-10	4275	3270	artifact scatter	6		N	1,2,4	N
CC:6:65	(BLM) CC:6:65, TQ-12	33000	3290	habitation	5,6		Y	1,2,5,8	U
CC:6:70	(BLM) CC:6:70, TQ-17	13600	3250	artifact scatter	5,6		Y	1,2,5	N

CC:6:73	(BLM) CC:6:73, TQ-20	720	3260	artifact scatter	5,6		N	1,2,5	N
CC:6:75	(BLM) CC:6:75, TQ-22	21850	3290	artifact scatter	6		N	1,2,4	N
CC:6:77	(BLM) CC:6:77, TQ-24	5000	3270	artifact scatter	6,7		Y	1,2,5,6	N
CC:6:40	ADOT and private land	62600	3330	hx & pre-hx habitation	6,7,9		Y	1,2,4,5,8	U
CC:6:39	ADOT and private land	11970	3300	habitation	6,7		N	1,2,6	U
CC:6:43	ADOT and private land	263680	3180	habitation	7		Y	1,2,3,4,5, 6,8	N
ASM>>	(BLM) CC:2:32	1925	3120	rock features, artifact scatter	6,7		N	1,4,5,6,8	N
	(BLM) CC:6:9, and 267	40000	?	rock-shelter, artifact scatter	1,7		Y	1,2,4,6	N
	(BLM) CC:7:68	36300	4200	rock-shelters, bedrock mortars, artifact scatter	6		Y	1,5,6	U
CC:10:3(b)	(BLM) AR02-04-131, TGE 5	13000	4200	artifact scatter, habitation?	6		Y	1,2,3,4,5	U
CC:10:5		40300	4050	habitation	5,6		Y	1,2,3,4,5, 8	P
CC:10:33	AAP 109-7	16128	4320	rock features, artifact scatter	6		Y	1,4,5	N
CC:10:40	AAP 110-7	4150	3830	artifact scatter	1		Y	1,4,5	N
** prob. wrong # CC:10:45	AAP 110-12	105000	3830	habitation	6		Y	1,4,5	P
CC:11:26	Anaconda #2	3600	3460	artifact scatter	5,6		Y	1,3,5,6	N
CC:11:25		40000		artifact scatter	6		Y	1,5	N
CC:11:47	AAP 111-2	12000		artifact scatter	7		Y	1,6	N
CC:6:50		14400		artifact scatter	6		N	1,2,8	N
	(BLM) CC:3:47	750		artifact scatter	6		Y	1,2,4,8	N
CC:6:13 & CC:6:15	(four separate records)	262500		habitation	7		Y	1,6,8	N
CC:7:42	(BLM) CC:7:75	45		sherd scatter	6,7		N	5,8	N

CC:7:55	(BLM) CC:7:88	200		artifact scatter	6,7		N	1,2,3,4,5	N
CC:10:97		2912		rock feature, artifact scatter	7	3	Y	1,3,5,6,8	U
	(BLM) CC:2:36	5525		habitation	6		N	1,3,5,8	N
CC:1:22		400	3050	habitation	6		N	1,3,5,8	U
	(BLM) CC:7:1	10000		artifact scatter	5,6		N	1,2,3,5	N
	(BLM) CC:11:10	5000		artifact scatter	7		Y	6	N
	(FS) AR03-05-04-217	19200	3800	habitation	6		Y	1,2,3,4,5,6	P
	(FS) AR03-05-04-218	86	3800	habitation	6		Y	1,8	P

Key:

Time Period
1 = None assigned   2 = Middle Archaic   3 = Late Archaic
4 = Early Pit Structure   5 = Middle Pit Structure   6 = Late Pit Structure
7 = Surface Structure   8 = Post-A.D. 1150   9 = Historic

Projectile Points
1 = Middle Archaic
2 = Late Archaic
3 = Unidentified

Ground Stone
Y = Yes
N = No

Architecture
N = None noted   H = Historic
P = Pit structure   U = Unknown
S = Surface structure

Ceramics
1 = Plain wares   2 = Red wares   3 = Red/buff   4 = Red/brown
5 = Black/white   6 = Corrugated   7 = Polychromes   8 = Other
0 = None

Surface Structure Period Sites

Site No. ASM	Site No. Other	Site Size m2	Elevation feet	Site Type	Time Period	Projectile Points	Ground stone	Ceramics	Architecture
CC:10:50	SS2	36	3880	field-house	7		Y	1,2,8	S
CC:10:59	SS13	60225	3780	field house	7		Y	1,5,6	S
CC:10:60	SS14	4635	3840	field houses, rock feature	7		N	1,3,5,8	S
CC:10:61	SS15	37440	3760	field houses	7		Y	1,4,5,6	S

CC:10:65	SS19	5610	3780	field-house	7	3	Y	1,4,5,6	S
CC:10:73	D&M #6	3000	4160	artifact scatter	6,7	3	Y	1,4,5,6	S
CC:11:52	SS28	7128	3465	habitation	7		Y	1,4,5,6	S
CC:7:25	SS47	32665	3540	pre-hx and hx struct	6,7,9	3	Y	1,2,4,6	S
	CC:6:3 (ARS) State Land	17000	3310	habitation	6,7		Y	1,5,6,8	S

Key:

Time Period
1 = None assigned 2 = Middle Archaic 3 = Late Archaic
4 = Early Pit Structure 5 = Middle Pit Structure 6 = Late Pit Structure
7 = Surface Structure 8 = Post-A.D. 1150 9 = Historic

Projectile Points
1 = Middle Archaic
2 = Late Archaic
3 = Unidentified

Ground Stone
Y = Yes
N = No

Architecture
N = None noted H = Historic
P = Pit structure U = Unknown
S = Surface structure

Ceramics
1 = Plain wares 2 = Red wares 3 = Red/buff 4 = Red/brown
5 = Black/white 6 = Corrugated 7 = Polychromes 8 = Other
0 = None

APPENDIX C - STATISTICALTESTS

Unpaired *t*-Test Results – Comparing Archaic and Aceramic Site Sizes

Group	Archaic	Aceramic
Mean	5168.18	6350.88
SD	4532.59	11257.38
SEM	1366.63	1023.40
N	11	121

P value and statistical significance: The two-tailed P value equals 0.7307
The difference between Archaic and Aceramic site sizes is not statistically significant.

Confidence Interval: The mean of Group One minus Group Two equals -1182.70. 95% confidence interval of this difference: From -7966.58 to 5601.17

Intermediate values used in calculations: t = 0.3449 df = 130
Standard error of difference = 3429.004

One-way Analysis of Variance – Comparing Site Sizes by Period

Source	DF	SS	MS	F	P
Factor	2	5.705E+10	2.853E+10	18.75	0.000
Error	268	4.077E+11	1.521E+09		
Total	270	4.647E+11			

```
                              Individual 95% Confidence Intervals for Mean
                              Based on Pooled St Dev

Level    N    Mean   St Dev  -+---------+---------+---------+-----
C1     121    6351   11257   (---*----)
C2      78   17307   25492       (-----*----)
C3      72   41812   69449                 (-----*-----)
                             -+---------+---------+---------+-----
Pooled St Dev =  39003        0     15000     30000     45000
```

One-way analysis of variance comparing site sizes from the Archaic period (C1), the Early Pit Structure period (C2) and the Mid/Late Pit Structure period (C3).

The F ratio is 18.75, and the p value is <.0001, showing significant differences in site sizes from separate time periods.

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