NPS Form 10-900-b
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United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

This form is for use in documenting multiple property groups relating to one or several historic contexts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. For additional space use continuation sheets (Form 10-900-a). Type all entries.

A. Name of Multiple Property Listing

Cultural Developments on the Pajarito Plateau in North-Central New Mexico

B. Associated Historic Contexts

Pajarito Plateau - puebloan adaptations in north-central New Mexico from A.D. 1175-1600

C. Geographical Data

The Pajarito Plateau Culture area is located in North-Central New Mexico within portions of Los Alamos, Rio Arriba, Santa Fe and Sandoval Counties. It is defined herein as that land lying between Santa Clara Canyon on the north, the Rio Grande river on the east, Cochiti Canyon on the south, and below the 8000 foot contour on the west. This is an area of about 236 square miles, or 151,040 acres. Bandelier National Monument, administered by the National Park Service, occupies most of the central portion of the Pajarito Plateau. The remainder of the Pajarito is either Indian land, State of New Mexico land, Department of Energy admininstered land that is part of the Los Alamos National Laboratory, land administered by the Bureau of Land Management, part of the Santa Fe National Forest, or privately owned. Only sites lying on land administered by the Santa Fe National Forest are being considered for nomination to the National Register under this multi-property nomination. This is about one-fourth of the entire Pajarito Plateau and limits the area under consideration to about 60 square miles, or 38,400 acres.

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D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards for Planning and Evaluation.

Signature of certifying official — Date: 9-14-90

USDA-Forest Service
State or Federal agency and bureau

I, hereby, certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Signature of the Keeper of the National Register — Date: 11/7/90

E. Statement of Historic Contexts

Discuss each historic context listed in Section B.

Name of Context: Pajarito Plateau - Puebloan Adaptations in North-Central New Mexico from A.D. 1175-1600.

Introduction: The Pajarito Plateau in north-central New Mexico is one of several late prehistoric culture areas in the upper Rio Grande region. The residents of the southern portion of this area (Frijoles Canyon and south) are generally considered to have been ancestral to the Keresan-speaking pueblos of Cochiti and Santo Domingo. The residents of the northern portion of the area (north of Frijoles Canyon) are generally considered to have been ancestral to the Tewa Pueblos.

This multiple-property group is organized in the following manner. First is a discussion of the environmental setting of the study area. Then a discussion of previous research and a culture-historical overview of the study area from preceramic to historical times is presented. A discussion of possible explanations of the Pajarito phenomenon follows. These sections present the historic context to which all the property types discussed later belong by virtue of their place in time and space. Six property types are defined, based on the results of thousands of acres of survey in the study area. Sites belonging to these property types represent over 90% of all known sites dating to the period indicated in the study area. Since sites belonging to these property types will be nominated on the basis of their actual or potential information producing value, the classes of important information present at sites of the each given type are discussed.

Environmental Setting: The study area covers much of what is termed the Pajarito Plateau (Bailey et al. 1969). The Pajarito Plateau is a part of the Jemez Mountain range, that was formed by intermittent volcanic activity during the Tertiary and Quaternary (Ross et al. 1961). The central feature of the Jemez Mountains is the Valle Caldera, a large collapsed volcanic crater about fifteen miles in diameter which overlies a slightly older and smaller, but similar feature, the Toledo Caldera.

The eruptions that formed the Toledo and the Valle Calderas occurred about 1.4 and 1.1 million years ago. These eruptions deposited a layer of ash which formed the lower Otowi Member and upper Tshirege Member of the Bandelier Tuff Formation. These eruptions covered an area of up to 400 square miles with the ash that has formed as much as 1,000 vertical feet of tuff. It has been estimated that some fifty cubic miles of ash resulted from these eruptive episodes (Ross et al. 1961).

The Pajarito Plateau encompasses a number of vegetation zones, which are dependent on elevation, exposure, and water. The elevation near the Rio Grande at the southeast end of the study area is about 5,200 feet. The mesas that make up the bulk of the settled regions of the Pajarito vary from about 6,400 feet up to perhaps 8,500 feet. Above 8,500 feet the landscape is mostly mountainous. At higher elevations (above 9,000 feet) spruce and fir associations predominate. Between about 7,200 and 9,000 feet elevation Ponderosa pine is the dominant

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overstory species. Below 7,200 feet one finds piñon-juniper associations. Along the margins of the permanent waterways one finds a riparian (cottonwood-willow) association.

As a diverse topographic region, the climate of the Pajarito is also quite varied. Rainfall increases from as little as 14 inches per year at lower elevations near the Rio Grande to 25 inches or more on the higher mountain peaks over 10,000 feet elevation to the west (Powers 1988:22ff). The freeze-free season (sometimes mistakenly termed the growing season) at 7,300 feet is said to have averaged 155 days over a 30 year period (ibid.). The overall growing season on the mesas of the Pajarito thus seems to be adequate in recent times for growing corn.

Wildlife now present in the Pajarito Plateau includes a number of large mammals that were probably important to the prehistoric residents of the area such as deer, elk, brown bear, and perhaps antelope in the lower elevations. Streams in the area would have been populated by the native Rio Grande Cutthroat trout. Smaller mammals such as rabbits are common. Avian species such as wild turkey, hawks, and eagles are present in the area today and were no doubt utilized for their eggs, meat, or feathers.

In general, the study area consists of a series of elevated, relatively flat mesas ranging from 6,000 to 8,000 feet elevation which contain most of the known archeological sites, separated by a series of relatively deep and narrow canyons with permanent watercourses flowing through them that contain high densities of sites, though lower than that found on the mesas. The mesa-tops are typically covered with Ponderosa pine, piñon pine, and juniper; but the canyons are a mixture of Ponderosa, piñon-juniper, and riparian vegetation.

Previous Research: Archeological research on the Pajarito Plateau began in the 1880s with the first visits of Adolph Bandelier. Bandelier conducted reconnaissance level survey concentrated in [redacted] and published the first culture history of the area along with site descriptions and site sketches in his so-called Final Report (Bandelier 1890, 1892). Bandelier's observations were later amplified with publication of his annotated journals (Lange and Riley 1966, 1970; Lange, Riley, and Lange 1975, 1984). Charles Lummis published some of the first photographs of the area in 1915. Edgar L. Hewett also conducted reconnaissance level survey of the Pajarito beginning in 1896 (Hewett 1904). It was Hewett who first defined the area as a distinct culture province and named it "Pajarito" (Spanish for "little bird").

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Hewett conducted the first "scientific" excavations in the area, beginning in 1899 [redacted] followed by poorly documented excavations at [redacted] (Hewett 1938:68-69). Later but also poorly documented excavations directed by Hewett included digs at [redacted]

At Hewett's insistence, Bandelier National Monument was created in 1916 from Forest Service land and under Forest Service administration. In 1933, administration of the Monument was transferred to the National Park Service. The primary archeological activity on the Pajarito Plateau during the 1930s and 1940s was the stabilization of the ruins excavated by Hewett.

Two archeological surveys were conducted on and around the Pajarito Plateau during the 1930s. The first of these, a survey of portions of [redacted] conducted by James A. Fulton in 1935, resulted in the identification of hundreds of archeological sites. Unfortunately, a report was never actually prepared for the survey. The second survey was conducted by Harry P. Mera of the Laboratory of Anthropology in Santa Fe as part of a series of much larger investigations he conducted in northern New Mexico (Mera 1935, 1940). Later surveys of Bandelier National Monument included a survey of the [redacted] by John F. Turney, and a horseback survey conducted during the late 1950s by Charles H. Lange of portions of the main unit of Bandelier.

In 1948 a series of salvage-type excavations was begun by Frederick Worman of Adams State College on land that was originally part of the [redacted] administered by the Atomic Energy Commission (later the Department of Energy). Such reports as were prepared for these excavations were usually brief (Worman 1967; Worman and Steen 1978). Other, better reported investigations at sites on Los Alamos National Laboratory lands were conducted by Charlie Steen in the 1960s and 1970s (Steen 1977, 1982).

In 1955 Fred Wendorf and Erik Reed proposed a chronological classification known as the Rio Grande Classification. Their proposed chronology was based on the changes in settlement pattern and material culture they believed were occurring across the Upper Rio Grande area. The Rio Grande Classification (Table 1) defines five broad time periods; Preceramic, Developmental, Coalition, Classic, and Historic. Most modern researchers utilize some modified form of the Rio Grande Classification in their discussions of sites on the Pajarito and not

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the so-called Pecos Classification with its Basketmaker II and III periods, and Pueblo I through V periods.

Table 1
Pajarito Plateau chronology (modified from Wendorf and Reed 1955).

Dates	Period Name	
10,000 B.C.-5,500 B.C.	Paleo-Indian\	Preceramic
5,500 B.C.-A.D. 600	Archaic	/ Period
A.D. 600-1175	Developmental	
1175-1325	Coalition	
1325-1600	Classic	
1600-present	Historic	

During the 1960s work began on the first phase of the salvage of archeological data from areas to be submerged by the construction of Cochiti Dam (Lange 1963). This work continued with a more modern approach in the 1970s, culminating with the publication of four volumes of data and interpretation (Biella 1979, Biella and Chapman 1977, 1979; Chapman and Biella 1977). Ojala Cave, an important site with a preceramic component, was excavated as part of the Cochiti Dam studies (Waber et al. 1982).

The Pajarito Archeological Research Project (PARP) under the direction of James Hill of UCLA, began in 1977 and continued through 1985. Some 935 archeological sites were recorded during the course of this project, and 19 sites were excavated (Hill and Trierweiler 1986). Robert Preucel, also of UCLA, conducted the Pajarito Field House Project during 1985-1987, and excavated several small fieldhouses in the area (Preucel 1987).

The Santa Fe National Forest began a professional cultural resources management program in 1978. Most of the Forest's program during the first few years consisted of cultural resources inventories conducted in advance of earth-disturbing projects such as road construction and timber sales. With the advent of better funding and recognition within the agency of the value of archeological resources, the Forest's program has expanded into long-term management of the many and varied

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archeological sites found on lands they administer. The Forest now has an active management-oriented program consisting not only of identification and inventory, but also site evaluation, nominations of sites to the National Register, such as this one, stabilization of threatened ruins, and interpretation of important sites for public education.

In 1987 the National Park Service began a long-term inventory of archeological resources located within Bandelier National Monument (Powers 1988). It is estimated that 40% of the Monument will be inventoried by the end of 1990. The Park Service will conduct some limited excavations as well. Tim Kohler of the University of Washington has been conducting excavations of selected sites within the Monument in association with the Park Service.

Site Types and Distributions: A complete search of archeological records on file at the Supervisor's Office of the Santa Fe National Forest was conducted during March 15-29, 1990. Some 498 sites were found to be located on Forest Service land within the previously defined limits of the Pajarito Plateau. Ten of these were recent historic and will not be considered further here. The remaining 488 sites were all associated with the initial prehistoric occupation, consolidation and expansion; and contraction, decline, and abandonment of the Pajarito Plateau from about A.D. 1175-1600. No sites datable to earlier or later periods have been recorded, or information is not recorded about such sites in Forest Service records.

Survey coverage in this portion of the Forest is highly uneven. No more than an estimated 50% of the area has been surveyed at all. Some areas have only been sample surveyed or surveyed on merely a reconnaissance level. Some areas have been surveyed several times by different groups. Many sites have more than one site form in the files. Other areas have received only the most cursory of examinations by poorly trained individuals.

Survey intensity is also highly variable. The vast differences in training, motivation, goals, and abilities among the various groups who have conducted survey on Forest lands on the Pajarito Plateau is quite apparent when examining site forms. Some site forms contain a wealth of detailed information, site maps, and good location maps. Others contain virtually no data beyond a presumed location and description of the type of site recorded.

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Since investigators associated with PARP (Pajarito Archeological Research Project) have not yet chosen to provide detailed data on most of the sites they recorded, dating these sites is very difficult. Unfortunately, more than half the sites recorded on the Pajarito Plateau located on Forest Service land were recorded by PARP. Naturally, this makes comparative analyses of these data subject to all sorts of unknown biases. In some cases, where data were contradictory or missing, assumptions were made on the part of the author. Nevertheless, with the preceding caveats in mind, the following information is presented.

In order to provide some degree of comparability, site types are for the most part those described in the Field Coding Manual used by the National Park Service for the survey of Bandelier National Monument. Table 2 below lists the types and numbers of sites that have been recorded on Forest lands in the area described.

Most of the Forest Service land considered here lies between 6,000 and 8,000 feet elevation. Sites have been recorded between 6,260 and 8,001 feet on Forest Service land in this area. Most surveys, and not surprisingly, most sites, have been located between 6,500 and 7,500 feet. Table 3 lists a breakdown of structural sites by elevation range.

Discussion: All datable sites date to the period A.D. 1175-1600. More precise dating is not possible for a majority of sites based on information on file at the Forest Service. Therefore, none will be attempted. The largest site located on Forest Service land on the Pajarito Plateau is the Guaje Ruin. The Laboratory of Anthropology site number is LA 12700, however, portions of the site are recorded under 15 different Forest Service site numbers for unknown reasons, although it is counted only once in the tables above. The usual Forest Service number given for the Guaje Ruin is AR 03-10-08-253.

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Table 2

Prehistoric site types recorded on Santa Fe National Forest lands on the Pajarito Plateau.

SITE TYPE	FREQUENCY	
Structural Sites		
Aggregated Pueblo (655 rooms)	1	(Guaje Ruin, LA 12700)
Communal Pueblos (100-160 rooms)	6	
Pueblos (6-99 rooms)	82	
Cavates/talus pueblos	19	
Small Structures (1-5 rooms)	217	
Total structural	325	
Artifact Scatters		
Lithic scatters	68	
Ceramic and lithic scatters	47	
Total scatters	115	
Isolated Feature Sites		
Bedrock pits ("eagle traps")	14	
Water/soil control	10	
Dam	5	
Shrines	4	
Trails	4	
Rock Art	3	
Rock rings	3	
Rock piles	2	
Isolated kivas	2	
Isolated hearth	1	
Total Isolated features	48	
Total sites	488	

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Table 3
Breakdown of structural sites by elevation range.

Site type/frequency	thousands of feet of elevation [redacted]				TOT
aggregated pueblo			1		1
communal pueblos	1	1	4		6
pueblos	1	40	42		83
cavates/talus pueblos		1	18		19
small structures	12	81	110	13	216
lithic scatters	1	14	7	46	68
ceramic/lithic scatters	4	21	19	3	47
all isolated feature sites	1	13	29	5	48
ALL SITES TOTAL	20	171	230	67	/488

The Guaje Ruin is termed an aggregated pueblo because it is composed of at least 12 distinct pueblo architectural units in close association. These architectural units have been estimated to have had a total of 655 rooms. In addition to the surface rooms, the cliffs below the pueblo contain at least 63 modified caves, some with rooms in front of them. The Guaje Ruin is a Coalition Period site, and seems to represent a number of diverse social groups moving together for some common purpose. The site is located at an unlikely 7,400 feet elevation. It is surrounded by numerous smaller sites. The Guaje Ruin is listed on both the State and National Registers.

Communal pueblos were arbitrarily defined by the Park Service as those sites having 100 or more estimated rooms. Six sites on Forest Service land on the Pajarito Plateau fit this criterion. These sites range in size from 100 to 160 rooms.

Culture-Historical Overview: This nomination concerns sites of the Coalition and Classic Periods only (from about A.D. 1175-1600). More than 95% of known sites recorded on Forest Service land on the Pajarito Plateau as defined here date to this time period. A brief discussion of the culture history of the area follows:

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The Preceramic Period is now usually divided into the Paleo-Indian Period (dating from ca. 10,000 B.C. to 5500 B.C.) and the Archaic Period (from ca. 5500 B.C. to A.D. 600. There is only scant evidence in the form of isolated projectile points (Steen 1982; Chapman and Biella 1979) that the Pajarito Plateau was utilized during the Paleo-Indian Period. Sites dating to the Archaic Period are rare on the elevated portions of the Pajarito Plateau. Most of the known sites with Archaic components date to the Armijo (1800-800 B.C.) or En Medio (800 B.C. - A.D. 400) Phases (Irwin-Williams 1973; Stuart and Gauthier 1981). These sites are typically found in rock shelters or are open campsites with occasional hearths. The earliest evidence of corn cultivation in the area comes from Ojala Cave with uncorrected radiocarbon dates of 590 B.C. and 670 B.C. (Waber et al. 1982:358).

During the Developmental Period (ca. A.D. 600-1175), reliance on maize agriculture (and presumably beans and squash) increased. Developmental Period sites are rare in the elevated portions of the Pajarito Plateau. Known early Developmental Period sites consist of one or a few pithouses located at lower elevations adjacent to permanent water sources. Later in the Period, sites are found at higher elevations, though still generally small and in low frequencies.

The late 1100s saw a tremendous increase in site density and area of distribution on the Pajarito Plateau. Most researchers attribute this increase to the immigration from the collapsing Anasazi centers in the Chaco Canyon and Mesa Verde areas, as well as the Gallina area. The Coalition Period (ca. A.D. 1175-1325) is said to begin with the development of the carbon-painted Santa Fe Black-on-white ceramics. Sites ranged in size from the single room fieldhouses to pueblos of up to 20 rooms. Larger sites of up to 200 rooms were also constructed and occupied during the Coalition Period, but determining the relative frequency of such sites awaits more detailed chronological information concerning the initial phases of occupation for large sites such as Tyuonyi, Tshirege, Otowi, and Tsankawi.

The Classic Period (ca. A.D. 1325-1600) saw a continuation of the population increase evident during the Coalition Period. Site size, frequency, and area of distribution reached their maximum during this period. The large aggregated villages such as Tyuonyi, Tshirege, Otowi, and Tsankawi reached their maximum size during this period. Such sites consist of large multi-storied roomblocks with plazas, plaza kivas, often a large or "great" kiva, and sometimes a reservoir. Organizational complexity seems also to have increased. Maximum population on the Pajarito Plateau seems to have been achieved around

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A.D. 1500, followed by a period of declining population, and final abandonment for habitation purposes by the late 1500s.

Historic utilization of the Pajarito by Native American, Spanish, Mexican, and Anglo-American residents of New Mexico seems to have been sporadic until the last 100 years. Homesteading and other uses of the Pajarito began in the 1880s. The Santa Fe National Forest was created in 1915 with the combining of the Jemez and Pecos Forest Preserves. Bandelier National Monument was created in 1916 and remained under National Forest Administration until 1933, when it was transferred to the National Park Service. Los Alamos was a small aggregation of homesteads and a Boys School until the Manhattan Project was created in 1943 to develop the nation's first atomic weapons. Los Alamos is now the location of the Los Alamos National Laboratory, scene of advanced research in nuclear physics.

The Pajarito Phenomenon

Discussion: Given the number of sites, the size of sites, the density of sites, the large number of pueblo sites, the elevation range of the sites, and the probable population of the study area during the period A.D. 1175-1600, it seems obvious that a special and unique kind of settlement and subsistence system evolved on the Pajarito Plateau.

The past environment in large part determined the course of human utilization of the study area during the Coalition and Classic Periods. Certain special characteristics of the landforms, soils, water availability, and climate there combined to produce an environment favorable for agricultural adaptations. Though many researchers have emphasized the increased rainfall at higher elevations as a factor in the utilization of the elevated portions of the Pajarito, other factors also contributed to the utility of the area for agriculture.

The dissected mesa and canyon landforms present in the study area are important because of their effects on weather and climate. Cold air, because it is more dense and heavier than warm air, tends to drain into topographically lower settings. This phenomenon, known as cold air drainage, results in shorter growing seasons in canyons in comparison to relatively flat mesa-tops.

Adams' (1979) analysis of this effect in the Hopi area concluded that the mesa-top growing season was as much as 20 to 25 days longer than in the valleys. He generalizes that cold air drainage in mesa and canyon country will make the growing season in the canyons 10 to 30 days

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shorter than on the mesa-tops. On the Hopi mesas, the elevation difference is between about 500 and 700 feet. On the Pajarito, this effect could be expected to be even more pronounced, since the elevation differences between the canyon bottoms and the mesa rims are sometimes 1,000 or more feet.

The depth, steepness, and narrowness of these canyons reduces the amount of solar radiation available in the canyon bottoms. The canyon rims are the effective horizons in the canyon bottoms. The sun drops below the canyon rim hours before it drops below the horizon on the mesa-tops, and rises over the rim hours after it appears on the mesas. This effect is even more pronounced in the spring and fall (planting and harvesting seasons).

The first crops and agricultural technology in the New World developed in Mexico, at least several thousand years B.C. Corn (maize) was the most important of these crops. Over succeeding millenia, corn seed and knowledge of the process required for growing it spread into the American Southwest. This diffusion probably occurred by at least 1000 B.C., and perhaps earlier. Corn remains at Ojala Cave indicate that maize horticulture was practiced in the study area by at least 600 B.C.

Prehistoric agricultural strategies were quite diverse. There has been a tendency to overstereotype these strategies. Some researchers have tended to view culture as a linear progression from less advanced to more advanced. Some have viewed irrigation agriculture as a prerequisite to the development of civilization. The so-called "hydraulic theory" of Karl Wittfogel (1957; Wittfogel and Goldfrank 1943) is illustrative of such an approach.

A number of recent studies have focused on agricultural variability in the Southwest (e.g., Vivian 1974; Cordell and Plog 1979; Woosley 1980; Cordell 1984:181ff; Cordell et al. 1984). Woosley, in particular, discusses the dangers of overstereotyping prehistoric agricultural strategies (1980:317), correctly pointing out that the same people who built a complex irrigation system for one field might have also utilized a simple unirrigated field nearby. She later suggests that "...water control and other cultivation strategies are largely induced by highly localized environmental situations."

Numerous strategies were available to the prehistoric farmers of the Southwest. The simplest method of agriculture anywhere is what archeologists sometimes term dry farming. Actually, the term "dry farming" is something of a misnomer, since it implies that the crops

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receive no water at all. The term rainwater farming is a more accurate description of this methodology. Rainwater farming involves the placement of seeds in the ground, and the reliance on ground moisture and naturally occurring precipitation to supply all the moisture requirements of the plant.

A simple variation of rainwater farming is termed pot irrigation. A ceramic vessel filled with water is poured over each plant. While this is more labor intensive than rainwater farming, pot irrigation could pull some crops through particularly dry periods without the heavy labor investments of irrigation ditches.

Floodwater farming involves the planting of crops in locations that receive periodic flooding. Locations such as the mouths of arroyos are preferred, making crops grown by this method prone to flood damage. This method of farming does not represent the use of technological enhancements and can be considered as another expedient variation of rainwater farming.

At a somewhat more complex level is the use of various water and soil control devices. These include such simple constructions as check dams and terraces. Check dams are low rock walls or even single alignments placed across small drainages to retard or redirect the flow of water towards garden or field areas. Terraces are low walls or alignments constructed perpendicular to the direction of the slope of the land. The purpose of terraces is to retard the flow of water and the erosion of soils in a restricted area. Short, shallow, simple ditches may be constructed to divert the runoff from a check dam into field areas. This may be termed expedient irrigation. Various grid gardens, gravel mulch gardens, and other forms of water and soil control features are somewhat more complex variations. The function of these features is to catch naturally occurring moisture, raise soil temperatures, and reduce the evapotranspiration rate of the soil. These devices are still just elaborations of rainwater farming. The prehistoric Pajaritans who occupied the uplands settings under consideration here appear to have been relying on rainwater farming or simple water and soil control techniques, since there is little archeological evidence of irrigation facilities in this area.

The classic conception of prehistoric Southwestern agriculture is that it consisted of three main crops; corn, beans, and squash. These three crops provided prehistoric Southwestern farmers with much of their nutritional requirements, due mainly to the complementary amino acids of beans and corn, and the balance of vitamins and minerals provided by all three plants. This basic triad was supplemented by other

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cultigens; the meat and eggs from wild and domesticated turkeys and other fowl; meat from large mammals; and collected wild plants.

But while other sources accounted for some of man's nutritional requirements, there is little doubt that corn was the staple crop of prehistoric Southwestern societies. Corn is sometimes characterized as a tropical grass, but there is a pronounced tendency to overstereotype the plant, its moisture and nutrient requirements, and its range of adaptability. Corn is grown at altitudes over 12,000 feet in the Andes Mountains and below sea level in the Caspian plain. Corn is grown in areas with less than ten inches and with more than 400 inches of annual precipitation. Corn is grown from north latitude 58° in Russia and Canada and as far south as latitude 40°. At the time of the discovery of the Americas, native Indian populations were growing all the five major types of corn; dent, flint, sweet, flour, and pop. All these varieties are classified by botanists as a single species, *Zea mays L.* (Mangelsdorf 1974:2).

The growing season required by corn has been estimated by some Southwestern ethnobotanists at 120 or more days (Minnis 1981). Great emphasis is placed on the lengths of the growing season in particular areas as a constraint to agricultural adaptations there. However, the Gaspe flint variety of corn grown in Canada and Spain matures in 60 to 70 days. Some tropical varieties of corn take ten to eleven months to mature (Mangelsdorf op. cit.). The key point here is that corn is genetically mutable and adaptable to a variety of environmental conditions. By simply saving the best plants for seed over several successive generations, prehistoric inhabitants of the study area could have easily produced a variety of corn highly suited for rainwater farming in their area.

Other edaphic factors affecting the length of time required for corn to mature include the timing and amount of available moisture, available soil nutrients, and solar exposure of the plant. Corn has also been said to require from 18 and 24 inches of precipitation per year (Minnis op. cit.). The timing of precipitation is as important to the productivity of corn as the total amount. Experiments to determine the effects of soil moisture stress on corn at different stages of growth have established that moisture stress during the tasseling stage, which occurs from 60 to 90 days after planting, can reduce the grain yield of corn plants as much as 50% (Robins and Domingo 1953; Denmead and Shaw 1960; Claassen and Shaw 1970).

Paleoclimatic reconstructions using the relationship between tree-ring widths and amount of precipitation indicate that the climatic regime

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between about A.D. 1140 and 1580 on the Pajarito was quite similar to that of today (cf. Cordell 1979; Dean and Robinson 1977). Droughts did occur during this period, and some were severe. Palmer Drought Severity Indexes for this period indicate one drought year every 8.3 years during the period A.D. 1150-1600 (Powers 1988).

Most past researchers have attempted to explain the Pajarito in their own terms. Pre-1960 sources concentrate on differences in architecture, and in ceramics and other artifacts to define rigid discrete time periods during which certain events transpired. Wendorf and Reed's chronological scheme is illustrative of this approach. More recent process-oriented syntheses such as Biella and Chapman (1977), Cordell (1980), Stuart and Gauthier (1981) have tended to concentrate on environmental and demographic change to explain changes in settlement pattern and subsistence through time.

Although the usual designations (Developmental, Coalition, and Classic) of Wendorf and Reed (1955) have been used here, it is not empirically evident that they really mean anything in terms of culture process. Even in their most simplistic terms, (e.g., pottery changes from the mineral-painted Kwahe'e Black-on-white to the carbon-painted Santa Fe Black-on-white), the temporal designations probably mask a great deal of variability. Some localities probably continued to make mineral-painted Black-on-white pottery even after the popularization of carbon paint. It is difficult to generalize about an entire region based on incomplete data from a few sites excavated many years ago. Likewise, what really happened in A.D. 1325 to suddenly make the Coalition Period a Classic Period, other than the appearance of Rio Grande Glaze-paint wares? This was not really an event, but a process of continual change, marked by three phases.

Three central research problems seem most relevant to the Pajarito. First is the problem of florescence. Why did prehistoric agriculturalists choose to occupy the Pajarito Plateau beginning around A.D 1150? Were changes in the environment contributory? Was population increasing in the upper Rio Grande through immigration or internal growth?

Second is the problem of expansion, consolidation, and stability. After the initial occupation of what had essentially been an empty landscape, prehistoric inhabitants of the Pajarito began a phase of expansion into the most desirable lands, construction of new pueblo sites and seasonally utilized structures, and attained their maximum population. What is the occupational and architectural history of the large aggregated pueblo sites on the Pajarito? Were these sites

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occupied in the 1200s or even 1300s? How large were these early components?

Third is the problem of decline and abandonment. Why was the Pajarito abandoned? Was the carrying capacity of the land exceeded? Were farmlands overfarmed and depleted? Did the appearance of aggressive non-agriculturalists result in aggregation of the puebloan agriculturalists in huge, more easily defensible sites near permanent water supplies? Did changes in the environment make low-intensity irrigation agriculture more reliable than the predominant rainwater-farming practiced on the mesas? Had leaders evolved who coerced the dispersed residents of the mesas to move into large villages? This was a tactic the Spanish adopted in order to manipulate and control dispersed puebloan populations.

Answering questions associated with these general research domains will require problem-oriented research such as the Pajarito Archeological Research Project, and Park Service's Bandelier Project. The purpose of the preceding discussion has been to establish the importance of different classes of information and define property types that may help answer important research questions. Based on the review of Forest Service site files, the following section discusses property types proposed for nomination and their potential to answer important research questions.

Property Types: The adaptation of the prehistoric Pajaritans to their environment resulted in the formation of numerous sites. A conservative estimate of the total number of sites associated with this phenomenon within the previously defined area based on present knowledge and partial surveys would be 15,000 sites. The Park Service has estimated 8,600 sites for Bandelier National Monument (McKenna and Powers 1986). After a review of the literature and existing Forest Service site data, the following six property types have been defined:

1. Aggregated Pueblo Sites
2. Communal Pueblo Sites
3. Small Pueblo Sites
4. Cavate/Talus Pueblo Sites
5. Small Structure Sites
6. Water/Soil Control Sites

These six types subsume more than two-thirds of the known sites dating to the period indicated located on Forest Service land in the study

(see cont. sheet 15)

area. Most of the remainder of known sites are artifact scatters, campsites, and isolated features such as hearths, bedrock game pits, and others.

National Register Criteria: Sites on the Pajarito Plateau are considered significant at the State level, although a few sites are nationally significant. Criterion D is the principal National Register criterion under which most of the sites in the Pajarito Plateau would qualify for nomination to the Register. Since this criteria involves the information a site has already yielded or its potential to yield information important in history or prehistory, it may be useful to discuss and describe the classes of information available from such sites, and why such information is important.

At least the following eight problem domains can be defined for the Pajarito Plateau:

1. Origins of the Pajarito Phenomenon - a key research problem concerns the source of the population increase that occurred during A.D. 1150-1275. Some have attributed this increase to immigration from declining Anasazi population centers such as Chaco Canyon and Mesa Verde. Such a hypothesis could be tested by excavating carefully selected early sites.

2. Subsistence - At least two different subsistence strategies were practiced in this area. The first occurs in the riverine environment along the margins of the Rio Grande, and along the permanent drainages in the canyon bottoms. In these relatively well-watered areas, settlement is concentrated along the watercourses, similar to the patterns elsewhere in the Upper Rio Grande area. Farming strategies may have included low intensity irrigation. The second strategy involves rainwater farming on the mesa-tops. The mesa-tops are where most of the pueblos, fieldhouses, and presumably the population were concentrated. There are no permanent water sources on the mesa-tops. There are various water and soil control features such as terraces and check dams. The hundreds of field houses on the mesa-tops indicate that dry farming, or perhaps more accurately, rainwater farming, was a successful agricultural strategy.

(see cont. sheet 16)

3. Social Organization - human societies organize themselves differently to respond to the demands their physical and cultural environments place on them. Clues to prehistoric Pajaritan social organization can be found in the way which they distributed themselves across the landscape. Another indication of social organization is the way space is utilized within their sites.

4. Technology - technology provided the interface between prehistoric Pajaritans and their environment. The level of complexity of a society is largely determined by the technology available to them. More socially complex cultures tend to exhibit more advanced technology.

5. Demography - the apparent rapid increase in the size of the population inhabiting the Pajarito Plateau during the late A.D. 1100s, the expansion and growth of population during the A.D. 1300s and 1400s, and the decline and abandonment of the area in the mid- A.D. 1500s is one of the most puzzling aspects of this area.

6. Trade and Alliance Networks - no culture develops in a vacuum, and the prehistoric Pajaritans were part of several trade and alliance networks that included trade in ceramics, obsidian, turquoise, and shell. These networks tended to shift through time as old enemies became allies and vice versa. Material cultural remains show trading relationships with other pueblos became stronger on the Pajarito through time.

7. Warfare and Conflict - high population densities and the arrival of aggressive non-agriculturalists in the Southwest during the late 1400s and 1500s must certainly have placed heavy social pressures on the populace of the Pajarito. Internecine conflict and harrassment by the nomads may have contributed to the abandonment of the dispersed settlement system and to the aggregation of the populace in the large protohistoric villages near the Rio Grande in which the first Spanish conquistadores found the natives of the region. Archeological evidence of warfare is notoriously hard to acquire, but could be found by examination of previously

(see cont. sheet 17)

excavated skeletal materials, or in fine-tuned excavations of pueblo sites.

8. Religion, Ceremony, and World View - it has always been difficult to reconstruct religious or ceremonial activities and world view from material culture remains. In the case of the prehistoric Pajaritans, historical documentation, and old and modern ethnographies can provide evidence to augment what we can learn from archeological excavations of kivas and studies of rock art.

The previously defined property types could be expected to yield information useful for answering research questions associated with the domains. Table 4 illustrates the information potential of each property type with regard to the previously defined problem domains.

(see cont. sheet 18)

Table 4
Data potential for Pajarito Plateau property types.

prop type \ problem domain	1	2	3	4	5	6	7	8
1	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X
3	X	X	X	X	X	X	X	X
4	X	X	X	X	X	X	X	X
5	X	X	X	X	X			
6		X	X	X				

KEY

Property Types:

1. Aggregated Pueblo Sites
2. Communal Pueblo Sites
3. Small Pueblo Sites
4. Cavate/Talus Pueblo Sites
5. Small Structure Sites
6. Water/Soil Control Sites

Problem domains:

1. Origins of the Pajaritans
2. Settlement and Subsistence
3. Social Organization
4. Technology
5. Demography
6. Trade and Alliance Networks
7. Warfare and Conflict
8. Religion and World View

F. Associated Property Types

I. Name of Property Type Aggregated Pueblo Sites

II. Description

The term "pueblo", Spanish for "town", is a general term applied to almost all prehistoric above-ground architectural remains in the Southwest. For present purposes, pueblos are defined as those above-ground architectural features with more than five rooms. Pueblos usually consist of one or more roomblocks containing multiple rooms with common walls, like an apartment complex. Walls are usually built of either stone or adobe. Pueblo roofs are usually flat and constructed by laying vigas, or logs used as roofbeams, across the walls and laying latillas, or small sticks, perpendicular to the vigas, then overlaying with earth.

(see cont. sheet 19)

III. Significance

Aggregated pueblo sites in the study area are likely to be significant for research for the following reasons. Aggregated pueblo sites are the largest sites known on the Pajarito Plateau. The full range of activities related to pueblo life were performed here. Archeological evidence from a well-preserved aggregated pueblo site could thus be used to answer an almost infinite universe of research questions related to subsistence, demography, social organization, technology, economics, religion, and trade. For the most part, pueblo sites on the Pajarito Plateau area have escaped serious pothunting damage.

(see cont. sheet 20)

IV. Registration Requirements

a) National Register criterion: d

b) areas of significance: prehistoric archeology, historic aboriginal archaeology

c) data requirements: A pueblo site must have the potential to yield data in one or more of the following categories in order to qualify for the National Register under criterion d.

1. A site must contain undisturbed deposits sufficient to demonstrate culturally meaningful spatial relationships among artifacts, features, floral remains, and faunal remains.

2. A site must contain structures, features, or artifactual materials that will permit inferences regarding human activities and site function.

[X] See continuation sheet

[X] See continuation sheet for additional property types

Pueblo rooms served a variety of functions, including shelter, work areas, sleeping units, storage, and ceremonial functions. Pueblo sites may have one or more plazas, or rectangular area enclosed by structures; and one or more kivas, or semi-subterranean ceremonial chambers (usually round). Pueblos with more than 100 rooms, at least one plaza, and at least one kiva are termed communal pueblos here. Aggregated pueblos are defined as two or more communal pueblos located close together (less than 200 m apart).

The Pajarito Plateau contains several examples of what are termed aggregated pueblos, but only one known example is located on Forest Service land. This site is known as the Guaje Ruin (Forest Service site number AR 03-10-08-253, and LA 12700). The Guaje Ruin has been individually nominated to the National Register. These sites have hundreds of estimated rooms in several multi-storied roomblocks; plazas, kivas, sometimes a large ("great") kiva, and sometimes a reservoir (as at the Guaje Ruin).

It is important to stress that an aggregated pueblo is not just a large pueblo site such as those at Tschirege, Otowi, and Tyuonyi. Those sites give the indication of having been planned as large sites when initially constructed. Aggregated pueblos like the Guaje Ruin give the indication of having been planned and constructed as separate units, built by people of entirely different social units who decided to come live together for some common purpose.

The construction of aggregated pueblos on the Pajarito Plateau was probably conditioned by social or environmental factors. The inhabitants of the Guaje Ruin may have been relying on the "strength in numbers" theory by constructing individual pueblo units close together in a defensible location. As to who they were protecting themselves against, one can only speculate. The A.D. 1200s seem to be too early for Athabaskan (Navajo and Apache) raids on pueblos or fields. Plains Indians straying far from their traditional lands to the east are a remote possibility. There may have been conflict among the residents of this area and the puebloan residents of nearby areas resulting in perceived danger and the architectural response of the Guaje Ruin.

Population on the Pajarito Plateau may have increased to the point that some degree of cooperation may have become necessary. Environmental factors during the A.D. 1200s may have favored larger-scale cooperative agricultural efforts under a more centralized control rather than single family horticulture. This could be reflected in utilization of larger field areas, construction of water/soil control facilities, and crop and field rotation.

The remains at these sites should be exceptionally well preserved. Subsurface contexts should generally reflect natural site formation processes. Previous excavations at pueblo sites have shown that there are likely to be well-preserved vegetal and skeletal remains, which could provide important information concerning demography and subsistence. Material culture remains at pueblo sites can provide important information concerning trade and contacts with other Indian groups. Since pueblo sites were occupied year-round, they should contain a full range of material culture remains that reflect technology, subsistence, social organization, demography, and trade relationships.

3. A site must contain structures, features, or artifactual materials that will permit inferences regarding settlement characteristics.

4. A site must contain either macrobotanical, microbotanical, or faunal remains indicative of subsistence practices.

5. A site must contain datable wood, charcoal, baked clay, or obsidian that will permit chronological placement.

6. A site must contain intact architectural features that permit analysis of floor space, floor features, and other spatial organizational characteristics.

7. A site must contain intact burials with human remains and other items that can be analyzed to provide information about pathologies, genetic relations, or social status of the individuals.

I. Name of Property Type: Communal Pueblo Sites

II. Description:

The term "pueblo", Spanish for "town", is a general term applied to almost all prehistoric above-ground architectural remains in the Southwest. Pueblos usually consist of one or more roomblocks containing multiple rooms with common walls, like an apartment complex. Walls are usually built of either stone or adobe. Pueblo roofs are usually flat and constructed by laying vigas, or logs used as roofbeams, across the walls and laying latillas, or small sticks, perpendicular to the vigas, then overlaying with earth.

For present purposes, pueblos are defined as those above-ground architectural features with more than five rooms and less than 100 rooms. Sites with less than six rooms are termed small structural sites. Sites with 100 or more rooms are termed communal pueblos (described previously). Sites consisting of two or more communal pueblos in close physical association are termed aggregated pueblos (described previously).

Most communal pueblo sites on the Pajarito Plateau presently appear as large, well-reduced mounds of earth, building stones, and materials from the collapsed roofs. Most communal pueblos consist of more than one such mound, or roomblock. An indication of the number of stories of pueblo sites can be obtained from the height of the mounds. A single story room block is generally reduced to a mound a meter or so high. Mounds of greater than two meters are usually interpreted as indicating a roomblock with two or more stories.

Communal pueblos were built in such a way as to partially or completely enclose a central area. These central areas, which were used as work spaces and locations for community activities, are known as plazas. By definition, a communal pueblo also contains at least one large round depression, usually interpreted as a kiva, which were ceremonial chambers where religious activities took place.

Because communal pueblos were places where comparatively large numbers of individuals lived, worked, slept, procreated, and died; one usually finds large numbers of material cultural remains that are associated with the architectural features present on the ground surface. These cultural remains consist for the most part of broken pottery, stone tool waste material, and broken tools such as manos and metates.

III. Significance:

(see cont. sheet 23)

There are six communal pueblo sites in the study area. They are likely to be significant for research for the following reasons. Communal pueblo sites are places where the entire suite of day - to - day activities in which the ancient Pajaritans took part, such as kiva ceremonies, occurred. For the most part, communal pueblo sites on the Pajarito Plateau area have escaped serious pothunting damage. The remains at these sites should be exceptionally well preserved. Subsurface contexts should for the most part accurately reflect natural site formation processes.

Previous excavations at communal pueblo sites have shown that there are likely to be well-preserved vegetal and skeletal remains, both of which can provide important information concerning subsistence and demography. Material culture remains at communal pueblo sites can provide important information concerning trade and contacts with other Indian groups. Since communal pueblo sites were occupied year-round, they should contain a full range of material culture remains that reflect technology, subsistence, social organization, demography, and trade relationships.

IV. Registration Requirements:

a) National Register criterion: d

b) areas of significance: prehistoric archeology, historic aboriginal archaeology

c) data requirements: A communal pueblo site must have the potential to yield data in one or more of the following categories in order to qualify for the National Register under criterion d.

1. A site must contain undisturbed deposits sufficient to demonstrate culturally meaningful spatial relationships among artifacts, features, floral remains, and faunal remains.

2. A site must contain structures, features, or artifactual materials that will permit inferences regarding human activities and site function.

3. A site must contain structures, features, or artifactual materials that will permit inferences regarding settlement characteristics.

4. A site must contain either macrobotanical, microbotanical, or

(see cont. sheet 24)

faunal remains indicative of subsistence practices.

5. A site must contain datable wood, charcoal, baked clay, or obsidian that will permit chronological placement.

6. A site must contain intact architectural features that permit analysis of floor space, floor features, and other spatial organizational characteristics.

7. A site must contain intact burials with human remains and other items that can be analyzed to provide information about pathologies, genetic relations, or social status of the individuals.

I. Name of Property Type: Pueblo Sites

II. Description:

The term "pueblo", Spanish for "town", is a general term applied to almost all prehistoric above-ground architectural remains in the Southwest. Pueblos usually consist of one or more roomblocks containing multiple rooms with common walls, like an apartment complex. Walls are usually built of either stone or adobe. Pueblo roofs are usually flat and constructed by laying vigas, or logs used as roofbeams, across the walls and laying latillas, or small sticks, perpendicular to the vigas, then overlaying with earth.

For present purposes, pueblos are defined as those above-ground architectural features with more than five rooms and less than 100 rooms. Sites with less than six rooms are termed small structural sites. Sites with 100 or more rooms, are termed communal pueblos (described previously). Sites consisting of two or more communal pueblos in close physical association are termed aggregated pueblos (described previously).

Most pueblo sites on the Pajarito Plateau presently appear as large, well-reduced mounds of earth, building stones, and materials from the collapsed roofs. Many pueblos consist of more than one such mound, or roomblock. An indication of the number of stories of pueblo sites can be obtained from the height of the mounds. A single story room block is generally reduced to a mound a meter or so high. Mounds of greater than two meters are usually interpreted as indicating a roomblock with two or more stories.

(see cont. sheet 25)

Some pueblos were built in such a way as to partially or completely enclose a central area. These central areas, which were used as work spaces and locations for community activities, are known as plazas. There are often large round depressions observed in association with pueblo sites, sometimes within plazas. These features are usually interpreted as kivas, ceremonial chambers where religious activities took place.

Because pueblos were places where comparatively large numbers of individuals lived, worked, slept, procreated, and died; one usually finds large numbers of material cultural remains that are associated with the architectural features present on the ground surface. These cultural remains consist for the most part of broken pottery, stone tool waste material, and broken tools such as manos and metates.

III. Significance:

There are 96 pueblo sites in the study area. Forty of these sites have between five and eleven estimated rooms. An additional 39 have between 11 and 30 estimated rooms. Eight pueblos have between 30 and 51 rooms, and 9 have between 50 and 91 rooms. Thus most pueblo sites (79 out of 96) on the Forest Service portion of the Pajarito Plateau are between 5 and 31 rooms. They are likely to be significant for research for the following reasons. For the most part, pueblo sites on the Pajarito Plateau area have escaped serious pothunting damage. The remains at these sites should be exceptionally well preserved. Subsurface contexts should for the most part accurately reflect natural site formation processes. Pueblo sites are places where activities occurred that were conducted nowhere else, such as kiva ceremonies. Since pueblo sites were occupied year-round, they should contain a full range of material culture remains that reflect technology, subsistence, social organization, demography, and trade relationships.

IV. Registration Requirements:

a) National Register criterion: d

b) areas of significance: prehistoric archeology, historic aboriginal archaeology

c) data requirements: A pueblo site must have the potential to yield data in one or more of the following categories in order to qualify for the National Register under criterion d.

(see cont. sheet 26)

1. A site must contain undisturbed deposits sufficient to demonstrate culturally meaningful spatial relationships among artifacts, features, floral remains, and faunal remains.

2. A site must contain structures, features, or artifactual materials that will permit inferences regarding human activities and site function.

3. A site must contain structures, features, or artifactual materials that will permit inferences regarding settlement characteristics.

4. A site must contain either macrobotanical, microbotanical, or faunal remains indicative of subsistence practices.

5. A site must contain datable wood, charcoal, baked clay, or obsidian that will permit chronological placement.

6. A site must contain intact architectural features that permit analysis of floor space, floor features, and other spatial organizational characteristics.

7. A site must contain intact burials with human remains and other items that can be analyzed to provide information about pathologies, genetic relations, or social status of the individuals.

I. Name of Property Type: Cavate/Talus Pueblos

II. Description

Cavate sites and talus pueblos are perhaps the single most distinctive site type found on the Pajarito. A cavate is created by utilizing either natural or man-modified openings in the volcanic tuff formations as rooms. A cavate room usually has a hearth, a smoke hole, and niches. The walls and floor are usually plastered.

Sometimes one or more masonry rooms are built in front of the cavate. A series of six or more rooms is a talus pueblo. Talus pueblos sometimes have several stories of both cavate and masonry rooms, made visible by the cavate openings and rows of viga holes pecked into the cliff face two or more stories high. Some cavates seem to have functioned as kivas, and

(see cont. sheet 27)

many such sites are associated with or have rock art or paintings in them.

Cavate/talus pueblos seem to be unique to the Pajarito, at least in the American Southwest. Such sites seem to have fulfilled a somewhat different function than surface pueblos. Their locations are usually in south facing cliffs. Such sites seem to have been built to take advantage of the weak solar radiation in winter for a passive solar effect. Cavate/talus pueblos also seem more defensible than open surface pueblos, since they are accessible only by climbing up a steep talus slope from the bottom of a canyon.

There are nineteen cavate/talus pueblo sites on Forest Service land on the Pajarito Plateau. These range from sites with just a few cavate rooms to one site with 48 cavate rooms and 75 talus pueblo rooms.

III. Significance:

The significance of cavate/talus pueblos lies in the uniqueness of the site type and the information they contain, information that in many cases is not preserved, or not preserved as well, in open sites. These classes of data include macrobotanical, microbotanical, and faunal specimens; human remains; and basketry, sandals, blankets, textiles, and artifacts made of wood. Perishable datable specimens such as tree-ring samples and carboniferous materials are also usually exceptionally well-preserved in cavate rooms.

IV. Registration Requirements:

a) National Register criteria: d

b) areas of significance: prehistoric archeology, historic aboriginal archaeology

c) data requirements: a cavate/talus pueblo site must have the potential to yield data in one or more of the following categories in order to qualify for the National Register under criterion "d".

1. A site must contain undisturbed deposits sufficient to demonstrate culturally meaningful spatial relationships among artifacts, features, floral remains, and faunal remains.

(see cont. sheet 28)

2. A site must contain structures, features, or artifactual materials that will permit inferences regarding human activities and site function.

3. A site must contain structures, features, or artifactual materials that will permit inferences regarding settlement characteristics.

4. A site must contain either macrobotanical, microbotanical, or faunal remains indicative of subsistence practices.

5. A site must contain datable wood, charcoal, baked clay, or obsidian that will permit chronological placement.

6. A site must contain intact architectural features that permit analysis of floor space, floor features, and other spatial organizational characteristics.

7. A site must contain intact burials with human remains and other items that can be analyzed to provide information about pathologies, genetic relations, or social status of the individuals.

I. Name of Property Type: Small Structural Sites

II. Description:

The most common site type in the study area are small one- to five-room structures. This designation includes the subclass of small structures that are often termed fieldhouses. Fieldhouses are thought to have been associated with agricultural utilization in the area. Over 200 small structures have been recorded in the study area.

There is considerable variability among the small structure type sites. At least two subtypes can be empirically defined. The more complex small structure sites exhibit more careful masonry construction with shaped tuff building stones, more than one room, dense and diverse artifact assemblages, and more subfloor features. The simpler small structures exhibit one room only, often small in size, and are evidenced only by a low mound of unshaped rubble; few or no artifacts; and no hearths or other features. Some small structures are also associated with check dams and other agricultural features.

(see cont. sheet 29)

III. Significance:

Because of the great number of such sites, Pajaritan small structures obviously fulfilled a very important role in the subsistence of the inhabitants of the area. They served a variety of possible functions, including temporary habitation, storage, hunting lodges, vacation homes, lookouts, and probably others that are not immediately obvious. It seems most likely that initially such sites were short-term residences for a single individual or family during the planting and harvesting seasons. The variability observable empirically in size, artifactual assemblages, and condition suggests that field houses evolved during the period under consideration here into more than just temporary shelters.

As the most numerous type of site in the area, small structures were an important element in the settlement system. Such sites have the potential to yield important data for reconstructing Pajaritan agricultural technology, subsistence, social organization, and chronology. Previously excavated small structures have exhibited intact features such as hearths, storage pits, and floors. Such sites have yielded datable chronometric specimens, and preserved macrobotanical and microbotanical remains.

Locational and distributional information regarding small structures and other agricultural sites is an important class of information in itself. Such data can be used to help characterize the relationships of the Pajaritans to their environment, how they organized themselves to take advantage of the opportunities their environment presented them, and how they buffered themselves from its challenges.

IV. Registration Requirements:

a) National Register criteria: d

b) areas of significance: prehistoric archeology, historic aboriginal archaeology

c) data requirements: a small structure site must have the potential to yield data in one or more of the following categories in order to qualify for the National Register under criterion "d".

1. A site must contain undisturbed deposits sufficient to demonstrate culturally meaningful spatial relationships among artifacts, features, floral remains, and faunal remains.

(see cont. sheet 30)

2. A site must contain structures, features, or artifactual materials that will permit inferences regarding human activities and site function.

3. A site must contain structures, features, or artifactual materials that will permit inferences regarding settlement characteristics.

4. A site must contain either macrobotanical, microbotanical, or faunal remains indicative of subsistence practices.

5. A site must contain datable wood, charcoal, baked clay, or obsidian that will permit chronological placement.

6. A site must contain intact architectural features that permit analysis of floor space, floor features, and other spatial organizational characteristics.

I. Name of Property Type: Water/Soil Control Sites

II. Description:

Water/Soil control sites include isolated sites with field areas, check dams, terraces, grid gardens, irrigation ditches, and reservoirs not associated with other structures. Such sites are relatively rare on the Pajarito, particularly when compared to nearby regions such as the Chama Valley. Apparent field areas are often observable on the mesa tops. These are generally flat areas, usually gently sloping to the south, characterized by a lack of large trees, and apparent field clearing marked by piles or rows of rocks on their margins. Check dams are short alignments of stones placed perpendicular to the direction of drainage in small arroyos. Their function is to divert or slow down the flow of runoff from rainstorms toward field areas or away from structures. Check dams also trap silt from runoff, creating a small flat fertile area that can be utilized for planting in later seasons.

Terraces are linear rows of stones placed on the ground parallel to the ground contour. These are usually found on somewhat steeper slopes than field areas, but generally also southward sloping. Grid gardens are similar to terraces but have interconnecting rows of stones which form a checkerboard pattern. Irrigation ditches are creases in the earth which cut off from a drainage and run across and slightly downhill. Their function is to divert water from drainages to field areas. Such features

(see cont. sheet 31)

probably did not appear with any frequency until after the arrival of the Spanish. Isolated reservoirs are usually created by the building of earthen dams across shallow drainages. Their function may have been to impound water for irrigation purposes, or for domestic uses such as cooking and cleaning.

III. Significance:

Water/Soil control sites could provide microbotanical or macrobotanical information regarding the types of crops grown at particular locations. Isolated reservoirs and irrigation features relate to more intensive agricultural utilization of the study area. If such features were to be found in some abundance (they are not at the present), then a more centralized social organization would be suggested. Thus such sites could provide important information regarding social organization and land-use. The distribution of such sites across the study area can provide important information regarding the land-use patterns on the Pajarito.

IV. Registration Requirements:

a) National Register criteria: d

b) areas of significance: prehistoric archeology

c) data requirements: a water/soil control site must have the potential to yield data in one or more of the following categories in order to qualify for the National Register under criterion "d".

1. A site must contain undisturbed deposits sufficient to demonstrate culturally meaningful spatial relationships among artifacts, features, floral remains, and faunal remains.

2. A site must contain structures, features, or artifactual materials that will permit inferences regarding human activities and site function.

3. A site must contain structures, features, or artifactual materials that will permit inferences regarding settlement characteristics.

4. A site must contain either macrobotanical, microbotanical, or faunal remains indicative of subsistence practices.

G. Summary of Identification and Evaluation Methods

Discuss the methods used in developing the multiple property listing.

(a) Archeological research on the Pajarito Plateau began in the 1880s with the first visits of Adolph Bandelier. Bandelier conducted reconnaissance level survey concentrated [redacted] and published the first culture history of the area, and site descriptions and sketches in his so-called Final Report (Bandelier 1890, 1892), which were later amplified with publication of his annotated journals (Lange and Riley 1966, 1970; Lange, Riley, and Lange 1984). Charles Lummis published some of the first photographs of the area in 1915. Edgar L. Hewett also conducted reconnaissance level survey of the Pajarito beginning in 1896 (Hewett 1904). It was Hewett who first defined the area as a distinct culture province and named it "Pajarito" (Spanish for "little bird").

Hewett conducted the first "scientific" excavations in the area, beginning in 1899 at [redacted], followed by poorly documented excavations at [redacted] (Hewett 1938:68-69). Later but also poorly documented excavations directed by Hewett included digs at [redacted]

[X] See continuation sheet

H. Major Bibliographical References

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1979 Cold air drainage and length of growing season in the Hopi mesas area. *The Kiva* 44:285-296.

Bailey, R.A., R.L. Smith, and C.S. Ross

1969 Stratigraphic nomenclature of the volcanic rocks in the Jemez Mountains, New Mexico. *Geological Survey Bulletin* 1274-P.

[X] See continuation sheet

Primary location of additional documentation:

- [ ] State historic preservation office
- [ ] Other State agency
- [XX] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Specify repository: Santa Fe National Forest

I. Form Prepared By

name/title Michael L. Elliott/Owner
organization Jemez Mountains Research Center date May 20, 1990
street & number P.O. Box 37433 telephone (505)888-2668
city or town Albuquerque state New Mexico zip code 87176

At Hewett's insistence, Bandelier National Monument was created in 1916 from Forest Service land and under Forest Service administration. In 1933, administration of the Monument was transferred to the National Park Service. The primary archeological activity on the Pajarito Plateau during the 1930s and 1940s was the stabilization of the ruins excavated by Hewett.

Two archeological surveys were conducted on and around the Pajarito Plateau during the 1930s. The first of these, a survey of portions of [redacted] conducted by James A. Fulton in 1935, resulted in the identification of hundreds of archeological sites. Unfortunately, a report was never actually prepared for the survey. The second survey was conducted by Harry P. Mera of the Laboratory of Anthropology in Santa Fe as part of a series of much larger investigations he conducted in northern New Mexico (Mera 1935, 1940). Later surveys of Bandelier National Monument included a survey of the [redacted] by John F. Turney, and a horseback survey conducted during the late 1950s by Charles H. Lange of portions of main unit of Bandelier.

In 1948 a series of salvage-type excavations were begun by Frederick Worman of Adams State College on land that was originally part of the [redacted] administered by the Atomic Energy Commission (later the Department of Energy). Such reports as were prepared for these excavations were usually brief (Worman 1967; Worman and Steen 1978). Other, better reported investigations at sites on Los Alamos National Laboratory lands were conducted by Charlie Steen in the 1960s and 1970s (Steen 1977, 1982).

In 1955 Fred Wendorf and Erik Reed proposed a chronological classification based on the changes in settlement pattern and material culture they believed were occurring across the Upper Rio Grande area known as the Rio Grande classification. The Rio Grande Classification (Table 1) defines five broad time periods; Preceramic, Developmental, Coalition, Classic, and Historic. Most modern researchers utilize some modified form of the Rio Grande Classification in their discussions of sites on the Pajarito and not the so-called Pecos Classification with its Basketmaker II and III; and Pueblo I through V periods.

During the 1960s work began on the first phase of the salvage of archeological data [redacted] (Lange 1963). This work continued with a more modern approach in the 1970s, culminating with the publication of four volumes of data and interpretation (Biella 1979, Biella and Chapman 1977, 1979;

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Chapman and Biella 1977). [redacted] an important site with a preceramic component, was excavated as part [redacted] (Waber et al. 1982).

The Pajarito Archeological Research Project (PARP) under the direction of James Hill of UCLA, began in 1977 and continued through 1985. Some 935 archeological sites were recorded during the course of this project, and 19 sites were excavated (Hill and Trierweiler 1986). Robert Preucel, also of UCLA, conducted the Pajarito Field House Project during 1985-1987, and excavated several small fieldhouses in the area (Preucel 1987).

The Santa Fe National Forest began a professional cultural resources management program in 1978. Most of the Forest's program during the first few years consisted of cultural resources inventories conducted in advance of earth-disturbing projects such as road construction and timber sales. With the advent of better funding and recognition within the agency of the value of archeological resources, the forest's program has expanded into long-term management of the many and varied archeological sites found on lands they administer. The Forest now has an active management-oriented program consisting not only of identification and inventory, but also site evaluation, nominations of sites to the National Register, such as this one, stabilization of threatened ruins, and interpretation of important sites for public education.

In 1987 the National Park Service began a long-term inventory of archeological resources located within Bandelier National Monument (Powers 1988). It is estimated that 40% of the Monument will be inventoried by the end of 1990. The Park Service will conduct some limited excavations as well. Tim Kohler of the University of Washington has been conducting excavations of selected sites within the Monument in association with the Park Service.

(b) The result of all the surveys and limited excavations in the area has been the accumulation of data of variable quality on 488 sites (on Forest Service land). The data were researched for preparation of this nomination by compiling a data base consisting of site numbers, locational data, environmental data, and descriptive information regarding site type, features, probable dates, and size. These data were analyzed to produce breakdowns of sites by type, date, elevation, environmental zone, condition, and landforms. These breakdowns produced the definitions of the property types contained herein, and the data requirements for determining the eligibility of specific

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properties.

The historic context for this nomination was prepared by conducting extensive library and archival research into the prehistory and history of the area. The geographical and chronological bounds of the historic context were determined through this research.

(c) The typology of significant property types is based on functional site types in common usage in the area for the relevant time periods. These types were utilized because they are in common usage and provide for convenient comparisons to sites in other areas.

(d) The requirements of integrity for the listing of related properties were derived both from the preparer's extensive personal knowledge of sites in the area and from information recorded on site forms, maps, and photographs of the sites.

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