

Bandelier Archaeology Survey Project 1996

Bandelier National Monument
Sandoval County, New Mexico

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The 1996 Bandelier Archaeology Survey Project

1. Introduction

The 1996 Bandelier Archaeology Survey Project (BASP) took place near the southern boundary of Bandelier National Monument, New Mexico between June 12, 1996 and August 20, 1996. Archeological technicians and volunteers surveyed 376 acres in five distinct areas located within the Dome Fire Burned Area perimeter. Work commenced just two months after a wildfire burned through 4,776 acres of the park. The primary goal for conducting this survey is 1) to identify the sites that are located within the Dome Fire Burned Area, 2) to determine which sites have been damaged by fire effects and 3) to mitigate the damage by prescribing preservation treatments to the damaged site.

The Emergency Fire Rehabilitation (EFR) allocated funds to the park for conducting a damage assessment and treatment survey project (DFAP 96 project) on all known sites within the burned area. This survey consists of visiting all known sites within the Dome fire project area and evaluating the fire effects damage to all the site known sites. The DFAP crew, an interdisciplinary team (composed of hydrologists and archeologists), was also expected to recommend preservation treatments for the sites damaged by the Dome Fire, write treatment plans and then perform the treatments immediately.

Funding for the DFAP 96 project, however, could not include the survey and mitigation of unrecorded sites within the burn boundary. Park management decided to allocate park base funds for conducting reconnaissance in moderately and heavily burned areas. The purpose of the survey is to ascertain the state of these undocumented sites after the wildfire burned through the site. The 1996 BASP archeologists worked concurrently and side by side with the archeologists of the 1996 DFAP project. The BASP were responsible for conducting survey, identifying unrecorded sites and then assessing fire damage on each site. If the site was at risk from Dome fire effects, would also recommended that a hydrologist visit these sites. The hydrologist could then determine if and what kind of hydrological treatment the site may need.

The other objective for the survey is to continue conducting an in-house archeological reconnaissance of the remaining unsurveyed portions (57 percent) of Bandelier National Monument. A more complete inventory would provide the park with more baseline information to help with management decisions that are now severely compromised by the lack of data. A complete inventory would also help to adequately interpret the cultural resources to the public.

2. Environment¹

Geology

The Jemez Mountains are the remnants of a large collapsed volcano or caldera that erupted 1.1 million and 1.4 million years ago, respectively. The Pajarito Plateau is composed of consolidated ash tuff 300 meters thick. The Pajarito fault zone runs north south on the eastern portion of the burn. Subsequent erosion has created landforms dominated by deep canyons that separate long, narrow upland mesas dissected by numerous intermittent drainages. The upland mesatops themselves are flat to gently rolling and generally narrow in width. They are composed of a variety of bedrock types, representing a complex mosaic of tuffs and andesites from Quaternary to Tertiary age. The three major drainages within the perimeter of the project (Alamo, Capulin and Sanchez Canyons) are composed of Bandelier tuff, which consists of white to tan to pink welded rhyolite ash flows that contain phenocrysts of sanidine and quartz. Outcrops of this formation manifest conspicuous pink cliffs on canyon side walls.

Two ancient landslides can be seen within the project area. One is located northeast of Boundary Peak and extends to the bottom of Capulin Canyon, while the other impacts the area southwest of Capulin Canyon Guard Station (Base Camp Cabin). Evidence for the age of the landslides is provided by archaeology; sites that date to at least AD 1500 are located on top of them.

Elevation

Canyon-bottom elevations range 6500 feet above sea level at the northern edge of the park boundary and 5500 feet at the southern end of Capulin Canyon. Mesa top elevations vary from 8000 ft at Boundary Peak, 7000 feet on a mesa above Red Canyon and to 7600 feet on a mesa south of Boundary Peak off the Dome trail.

Vegetation

Three major vegetation zones characterize the project area: pinyon /juniper woodland, ponderosa pine forest, and the riparian zone. The primary riparian zone lies in Capulin Canyon and consists of cottonwood, ash, Douglas fir and Ponderosa pine. A Ponderosa pine community, near Boundary Peak, has a continuous canopy with large amounts of accumulated deadfall. Pinyon/juniper communities cover the mesas between the canyons.

The Ponderosa Pine located near Boundary Peak and in the upper reaches of Red Canyon were severely burned. Pinyon-juniper communities on the mesas were slightly to moderately burned in some areas and severely burned in others. The riparian zone

This section summarizes information reported in more detail in Mathien, Allen et al, 1993¹. The reader who wishes a more comprehensive discussion is referred to pages 5-8.

vegetation in upper Capulin Canyon burned only lightly. In lower Capulin, however, the Ponderosa and pinyon-juniper vegetation communities burned with moderately to high intensity, and the vegetation was 100% consumed.

Soils

Soils in the burn area are deposited on gently sloping mesa tops and very steeply sloping canyon walls. In general, the soil on steeper slopes manifests little to no soil development; this indicates a high rate of natural erosion. The most common vegetation found on these steep soils consists of ponderosa-juniper woodlands. Aridic Haplustalf soils are found on gentler slopes and manifest more soil development than the soils on steep slopes. Landslide features contain Typic Ustorthent soil that is cobbly or stony sandy loam. Overstory vegetation located on top of this soil community consists of Ponderosa pine and the understory vegetation is composed of pinyon-juniper. The valley bottoms manifest the deepest, most productive soil. Vegetation associated with the valley bottom is narrow leaf cottonwood and Ponderosa. The common soil constituents in the Jemez Mountain Range are rhyolites and andesites. Some dacites and latites are found at high elevations, while tuff and pumice occur on the plateaus and basalts are found near the Rio Grande.

Climate

The climate near to the Bandelier Area is best described as a semiarid continental climate with attributes such as infrequent surface runoff and a developed monsoon season. Annual precipitation ranges from 30 cm at the lowest elevation to 90 cm. at the caldera rim. At the Bandelier weather station, however, precipitation averages 40.7 cm, with cyclonic storms in winter that brings snow to all elevations. Nearby, Los Alamos has a 5-month growing season (100 days; May 6-October 16). July is the warmest month of the year (20C) and January is the coldest month (mean temperature =-1.6 C). Sixty percent of the annual precipitation falls between June and September, during the summer monsoons. (Mathien et al.1993).

3. Culture-Historical Overview

Cultural Historical Overview of Bandelier and the Pajarito Plateau Region
By Elizabeth Mozzillo (From Mozzillo et al. 1997: 5-15)

Material culture remains attest to the presence of humans in the area from Paleoindian times to the present. The most numerous and best-known cultural materials pertain to the periods of Ancestral Puebloan occupation. Bandelier is the only major unit of the national park system that preserves material remains documenting Puebloan prehistory after AD 1300 (Powers and Van Zandt 1994:5). This summary centers primarily on archaeological materials known from lands within the park and the greater Pajarito Plateau. This arbitrarily defined region encompasses a number of archaeological cultures that can be viewed as related to the Anasazi or Ancestral Puebloan cultural tradition as it has been generally defined for the American Southwest.

The uniqueness of local Ancestral Puebloan culture history is reflected in area chronology. While the Pecos classification is commonly used for Anasazi sites and materials, the scheme generally used for the Northern Rio Grande or area more effectively encompasses the local cultural developments of the Pajarito (see Wendorf 1954; Wendorf and Reed 1955).

Table 1: Comparison of Northern Rio Grande and Pecos Chronologies

Dates	Pecos Phases	Rio Grande Phases
A.D. 1600	Pueblo V	Historic
A.D. 1300-1600	Pueblo IV	Classic
A.D. 1100-1300	Pueblo III	Coalition Late Developmental (continues)
A.D. 900-1100	Pueblo II	Late Developmental
A.D. 700-900	Pueblo I	Early Developmental (continues)
A.D. 400-700	Basketmaker III	Early Developmental Archaic
B.C./A.D. -400	Basketmaker II	Archaic

A. Cultural Sequence of Bandelier and the Pajarito Plateau

As noted, evidence for human occupation of the region dates as far back as Paleo-Indian times, although material cultural remains of that age are sparse in Bandelier and the Pajarito Plateau. An isolated Clovis point recovered south of Capulin Canyon during the Cochiti Lake mitigation work represents the sole physical evidence for a Paleo-Indian presence within the park (Powers 1994:21; Traylor et al. 1990).

The Archaic period generally dates in the American Southwest from approximately 5500 BC to AD 100. In the northern Rio Grande culture area, however, cultural materials attributable to peoples following Archaic lifestyles are known from as late as AD 600. At least sixty-nine Archaic sites have been documented for the Pajarito Plateau, including sixteen recorded at Bandelier. Archaic sites in and near the park generally consist of campsites and shelters as well as activity areas (e.g., lithic reduction sites).

It is generally believed that the Early Developmental (AD 600-900) florescence of Puebloan lifeways in the Northern Rio Grande represents an in situ development. Early Developmental sites are relatively rare, and where they occur, they are generally located at lower elevations near water sources (Mathien 1986: 1-5). No Early Developmental sites were known for Bandelier prior to the survey, and none were found during the course of the fieldwork.

Late Developmental (AD 900-1150/1200) sites are known for a wider range of altitudes, up to 6500'. It has been suggested that the shift to high altitudes--supported by an increased reliance on dry farming--may help account for their presence at Bandelier (Powers 1987:74-75). Within Bandelier, evidence for Late Developmental habitation has not been found. The investigators who developed the Bandelier Survey predicted that Developmental Anasazi settlement should be represented by a small, pioneer population during the last fifty years of the period (Powers 1987). Their data more or less confirm this, although it is important to note that less than 50% of park lands have been investigated--the picture might change with more survey data.

The Coalition period for the Pajarito Plateau greatly increase during the Coalition period (AD 1200-1325) and it seems to be earliest period of substantial human occupation. Coalition sites generally consist of small (although some are large) masonry pueblos dominated by Santa Fe Black-on-white pottery. The surge in numbers of sites (and presumably, people) is generally attributed to a migration, or migrations, of San Juan Anasazi from the Four Corners area (see, for example, Ford et al. 1972; Mera 1935; Wendorf 1954; Wendorf and Reed 1955; and others). The replacement of black mineral paint with organic media for pottery decoration (a hallmark of the Santa Fe and Galisteo Black-on-whites) may reflect migration from the San Juan area, either as an introduction or supplementation of Tewa peoples into the Northern Rio Grande area. The concomitant appearance of San Juan architectural styles, particularly kiva features, tends to strengthen this interpretation (without confirming the supposed Tewa ethnicity of the migrants).

Trends prefigured in the preceding Coalition period are institutionalized during the Classic (AD 1325-1600). Sites exhibit great variability in size and plan, ranging from one-room fieldhouses to large, aggregated communities of several hundred rooms. Many villages incorporate or are associated with large or "great kivas," implying increases in village-wide ceremonial organizations that both reflect and enhance concomitant increases in social and political complexity (Powers and Van Zandt 1994:28). As might be expected, evidence for trade and exchange--and even the existence of networks that would have controlled the flow of certain materials--increases at Classic sites.

As Coalition sites are abandoned, settlement appears to constrict to areas below 6500'. The incidence of fieldhouses and water control features increase for the period, although the generally dispersed nature of these site types (along with the lack of large-scale irrigation features) suggests their construction and use by individual families rather than the larger corporate groupings that would have controlled villages and trade networks. In general, aggregation--the coalescence of dispersed habitation sites into a settlement pattern that featured large, aggregated villages--appears to have been a highly important social phenomenon in the Classic period.

Puebloan sites within Bandelier and the surrounding Pajarito Plateau were subsequently abandoned by approximately AD 1600, although there has also been continuity into historic and modern times, as well as various phases of the Euro-American invasion (AD 1540-1848). Many sites and features preserved within park

boundaries continue to be used, however, by contemporary Puebloan peoples for ritual and other activities.

4. Previous Archaeology in the Project Area

James Stevenson, working for the fledgling Bureau of American Ethnology, made one of the earliest documented visits to the landscape that would be eventually preserved as Bandelier National Monument (Mathien 1986; Stevenson 1886). The most famous early visitor, however, was unquestionably Adolph F. Bandelier. During the course of five field trips to the Pajarito Plateau that he made during the 1880s as an associate of the Archaeological Institute of America, he visited sites in Frijoles Canyon (what Hewett would later delineate as the "Tyuonyi Group") and on the Cañada de Cochiti, and described what he saw in his journals (Lange and Riley 1966; Lange et al. 1970, 1975, 1984; cf. also Bandelier 1892). Charles Lummis accompanied him as a photographer during some of his fieldwork. The words and images created by these two men would attract the attention of archaeological professionals and others, and would ultimately lead to the protection of a sizable portion of the Pajarito Plateau as a national monument.

Edgar Lee Hewett and the "Pajarito Park"

Archaeological fieldwork began with the arrival of Edgar Lee Hewett, who initiated reconnaissance in 1896 and 1897 of the area between Santa Clara Canyon and the Rito de los Frijoles. Following these two seasons, he conducted some additional fieldwork, including excavation, in the area on a sporadic basis until 1903 (Hewett 1904; Mathien 1986). Hewett excavated at Puye in 1899 and also completed a number of poorly reported "preliminary excavations" at Tschirege, Tsankawi, and nearby sites.

Hewett also conducted excavations at numerous sites in the park, including Ceremonial Cave, Long House, Talus House, Tyuonyi (and associated structures, including Big Kiva), Frijolito, San Miguel, Yapashi, Big and Little Otowi, and Tsankawi, with further work at Puye⁷ and Tschirege. Some of these were major excavations, but the reports that exist are brief and sparse, or deal only with specific aspects such as ceramic typology, chronology, or rock art. Hewett's major contribution to Bandelier archaeology probably lies in his definition of the Pajarito Plateau as a distinct culture area within the larger Jemez Plateau. Hewett lobbied successfully for passage of the Antiquities Act of 1906 and for the creation of a "Pajarito Park". The creation of Bandelier National Monument short of his vision of a park that encompassed the entire Pajarito Plateau.

Early Work at Bandelier: Stabilization and Excavation

Bandelier came into the National Park System in 1932, during an era when travel to Western parks was heavily promoted by the NPS. Visitor facilities (many of which are now considered historic sites in their own right) were constructed in numerous park units, and in parks that conserved cultural sites, funds were provided to excavate and/or stabilize sites so that visitors would have something to see. At Bandelier, stabilization

work (on sites excavated by Hewett) began in 1933, with Paul Reiter (1934) directing Civil Works Administration (CWA) and Civilian Conservation Corps (CCC) crews⁸.

J.W. Hendron stabilized the Ceremonial Cave kiva and Big Kiva (also sometimes referred to as "the Large Kiva") in the late 1930s; again, some minor excavation probably occurred (1937a&b, 1940) during the course of this work. Hendron (1938a&b, 1940) also stabilized Tyuonyi and Talus House, and in 1943 he excavated five masonry rooms and four cavates at Group M. In addition, Hendron excavated at Potsui'i II (in the Otowi section of the monument) one of the first small, early sites to be excavated (1945).

Robert Lister (1939a&b, 1940a,b,c,d) continued park stabilization work at Long House and on the Otowi tract, also completing a small amount of excavation at both sites. In addition, Lister stabilized what he referred to as the "Cave Ruins" and "Frijoles Cave Ruins." Stabilization work were also continued at Long House and Big Kiva in the 1940s (Onstott (1948a&b).

Excavation conducted as scholarly inquiry within the park commenced with the work of Frederick C.V. Worman of Adams State College. An NPS crew finished the dig when Adams State College work was discontinued (Caywood 1966).

Early Surveys and Excavations in the Park

H.P. Mera (1933a&b, 1934, 1935, 1940) conducted a series of surveys covering much of Rio Grande Valley, including sites on the Pajarito Plateau and in the Bandelier area. The purpose of his work was to define ceramic wares, establish more detailed chronologies, determine the relationships between prehistoric and modern Puebloan peoples, and to examine changes in the distribution of population in the area over time.

Test excavations were carried out at many Plateau sites from 1931 to 1940 by W.S. Stallings of the Laboratory of Anthropology (1933, 1937). His goal was to develop a tree-ring chronology for the Upper Rio Grande district; large sites he investigated include Tsiping, Tsankawi, Tsirege, Water Canyon Ruin, Tyuonyi, Rainbow House, and Frijolito¹¹.

John F. Turney (1962) of the NPS conducted the first systematic survey inside the park boundaries at the detached Otowi unit in the 1950s. Ceramics collected during the course of this work dated from AD 1200 to the 1500s. In particular, ceramic data for Otowi and Tsankawi (the largest sites) provided evidence of habitation prior to the construction of the large pueblos, as well as attesting to late Classic occupation for both sites.

From 1957-1959 Chuck Lange (then of Southern Illinois University) conducted a survey on horseback of accessible mesa top areas in the main section of the park and portions of the neighboring James Webb Young Ranch (Cañada de Cochiti Grant), documenting nearly 150 structural Anasazi sites. Accompanied only by his son, he was attempting to verify the locations of sites indicated on newly published USGS maps

(locational data had been taken from aerial photographs). The two surveyors documented mound sites only, ignoring scatters and small structural sites (Mathien 1986:2-14). Previously assigned LA numbers were used where possible and sites were marked with rebar tagged with the site numbers and supported by stone cairns. Lange prepared a site catalogue and took ceramic surface collections, but no report was prepared (Powers 1987:39). Lange continued fieldwork on the Pajarito in 1969, conducting excavation and survey in the eastern portion of the Cañada de Cochiti Grant (Frisbie et al. 1970). Some test excavations were conducted at a limited number of sites, and an additional 166 sites were inventoried.

Survey completed by Charlie Steen (1977, 1982) in the 1960s and 1970s on LANL lands, together with Worman's work (1967; Worman and Steen 1978), resulted in identification of some 402 sites on LANL lands north of Bandelier. Two Archaic and two Paleoindian points were found during the course of this work, although the majority of the sites are Ancestral Puebloan. One of Steen's major contributions was the (1977) definition of "plaza pueblos" (e.g., Otowi, Tyuonyi, and Tsankawi).

The need for further assessment of the archaeology of the Cañada de Cochiti area and the probable impacts of adding it to the park led to the study of Flynn and Judge (1973). Sites recorded included Archaic, Coalition and Classic sites, but no Developmental sites.

The Cochiti Dam Project: Salvage Archaeology at Bandelier

In the 1960s, salvage archaeology was performed on park lands slated for inundation by the Cochiti Dam project (Hubbell and Traylor 1982). A series of surveys resulted in documentation of 37 sites on 361 acres of impacted land that lie within the park. Mitigation through excavation took place in the mid-1970s. The Museum of New Mexico undertook a companion project on adjacent, non-NPS land at approximately the same time (1962-1965), during the course of which 28 sites were identified and three were excavated (Lange 1968). Sites located by Lange's crews included a lithic reduction area and a 100-room pueblo.

From 1973 to 1977, the University of New Mexico and New Mexico State University undertook a comprehensive archaeological assessment of the Cochiti Reservoir area (Biella 1979; Biella and Chapman 1977; Chapman and Biella 1977, 1979). This was the second phase of mitigation conducted for the Cochiti Lake area, an inventory survey of archaeological remains in permanent and flood pool areas of the reservoir (the maximum flood pool defined the project area -- 9060 acres). 325 sites were identified, pertaining to the Late Archaic, Anasazi, and Historic periods, and an Agate Basin point was recovered.

"Reservoir excavations" (Traylor 1982) were conducted in the floodplain from 1974-1977, as a follow-up of the surveys that began in the 1960s. During this phase of the mitigation 37 sites of Archaic, Anasazi, and Historic temporal and cultural affiliations were surveyed or excavated. Ojala Cave not only provided the most important evidence

for Archaic occupation (2010 BC - AD 560), but yielded two kernels of corn at very early dates for the Rio Grande sub area (670 and 590 BC, respectively). Two smaller Archaic shelters in Alamo Canyon were also excavated.

One of the more important sites excavated was Pueblo del Encierro, a large Coalition and Classic Pueblo, occupied to ca. 1550 (Snow 1976). His interpretation of the resulting data focused on interpreting site economy within a framework that incorporated the prehistoric ecological context for the region.

Other Relevant Park and Area Research

Survey and excavation within the boundaries of Bandelier National Monument was carried out following the La Mesa Fire of 1977. While the express purpose of the work was identification of fire suppression impacts (and secondarily, examination of the effects of catastrophic wildfire on cultural features and materials), the survey resulted in identification of 99 sites, four of which were ultimately excavated¹⁵ (Traylor et al. 1990). Data from the excavations provided insight into potential subsurface heating impacts on cultural materials affected by catastrophic wildfire, as discussed below.

The Bandelier Archaeological Survey (BAS)

From 1987-1991 teams of field archaeologists employed by the National Park Service, Southwest Region, were deployed at Bandelier National Monument to locate and document cultural sites on park lands. Their efforts were guided by a research design intended to satisfy inventory and other management needs as well as facilitate academic inquiry into one of the important problems of Bandelier and Northern Rio Grande Anasazi archaeology (not to mention world archaeology): why population aggregation occurs and what changes result as a consequence of it" (Powers and Van Zandt 1994).

The combination of a cultural sites inventory with a problem-oriented research program represented a signal effort on the part of the project organizers, and resulted in a database that allowed for both descriptive and statistical analyses, and modeling. When the fieldwork was complete, 43% of the park's 32,737 acres had been surveyed using both judgmental and probabilistic sampling protocols (for detailed explanations of these terms and their meaning in the analyses, see below). 1,959 cultural sites were identified, including types ranging from communal pueblos and small structures built by Ancestral Puebloans to the remains of activities pertaining to the historic era. Data collected about each site included categories of information specific to archaeological inquiries (e.g., associated ceramic and lithic types), categories of information relevant to management concerns (such as site conditions), and variables of interest to both park managers and archaeologists (e.g., site sizes, locations, etc.).

As a companion project to the BAS site inventory, Timothy A. Kohler of Washington State University conducted test excavations at five sites in the park during the course of four field seasons, from 1989-1991, to address issues related to settlement aggregation during the Coalition and Classic Periods (Kohler 1989; Kohler and Linse

1993). Specifically, he investigated the proposition that subsistence intensification, necessitated by population growth, led to increased agricultural specialization. Sites that were excavated include four pueblos and a cave in Group M (Kohler 1989; Kohler 1990; Kohler and Linse 1993; Kohler and Root 1992).

5. 1996 BASP Crew Members:

The core 1996 BASP crew consisted of Student Conservation Associates, Angelica Medrano Enriquez, and Serena Love and Volunteer-in-the-Park, Patricia Hampton under the direction of Archeological Technician, Lisa Schub. The following DFAP 1996 assisted the core crew occasionally on survey: Samantha Ruscavage-Barz, Michael Brennan, Paul Blomgren, Ed Maloney, Peter Dudley, Suzanne Koehler, Daniel Wells and Rick Powder. A total of 100 person-days were expended on this project.

6. 1996 BASP Methods:

The 1996 BASP and DFAP followed the Bandelier Survey (1987-1991) methodology² and walked systematic pedestrian survey in unsurveyed areas. They used a 100% complete survey coverage technique and completed transects with intervals spaced no more than ten meters apart within the entire survey area. The crews noted that ground visibility was good in all five areas. The Dome Fire burned through the park in a mosaic pattern, burning some areas heavily, moderately, lightly, and none at all. In heavily and moderately burned areas, the fire ignited and consumed all of the understory vegetation that ultimately created good ground visibility. Archeologists commented that without dense understory, architectural features were easy to observe, however, noted that the presence of deep ash in Survey Area 1-4 made observing surface artifacts challenging.

The BASP survey recorded sites using the Bandelier Survey recordation form and they completed in-field analysis of lithics, groundstone and ceramics. At first, they deviated from the methodology in the artifact analysis, They did not set up artifact sample areas nor did they follow the analysis methodology in the same way as the survey did. Instead, they observed all the artifacts across the entire site and listed what they found. A majority of the sites appeared to be small structures with a small artifact assemblage and only three of the sites were pueblos. In order to save time, they did not always measure the lithics. They did however, change over to the Bandelier Survey methodology later in the season because it was more comprehensive (even if it took more time to record sites).

They also assessed the sites for fire effects damage using a DFAP damage assessment form. If the sites sustained fire effects damage, they recommended that a hydrologist should visit the site to prescribe preservation treatment that will mitigate site damage.

² We used the Bandelier Survey format instead of the ARMS format because the former captures the information required by ARMS and also includes more categories of information such as erosion that the parks needs for management decisions.

7. Results of Recorded Site and Isolated Occurrences

The Bandelier Archaeology Project archeologists recorded 71 new sites within five survey areas (See Figure 2). The new sites LA 115095-115164, LA 3830 and 3831 are summarized in Appendix 1. The recorded sites consisted of 39 small structures, 9 lithic scatters, 5 lithic and sherd scatter, 3 rock art sites, 6 unknown structures, 1 cavate structure with rock art, 1 eagle trap, 4 checkdams, alignments, and terraces, 2 pueblos and 1 potdrop.

BASP crews also rerecorded 2 previously documented sites (LA 3830 and 3831) in and nearby to Survey Area 4. Charles Lange originally recorded these sites his 1957 - 1959 horseback survey. He marked the site with rebar tagged with the site number and supported it by stone cairns. He also prepared a site catalogue and took ceramic surface collections (Powers 1987:39), but the data he collected was only preliminary and does not meet park standards.

Listed below are the survey areas, survey area locations, types of burn severity present, ground visibility and the type of sites found in each survey area.

Survey Area 1: This area is bounded by Boundary Peak to the west, Capulin Canyon to the north and east and an unnamed drainage to the south. It is situated on a landslide landform in a ponderosa and pinyon-juniper woodland. The fire burned in a mosaic pattern throughout the survey area heavily burning the north portion of the survey area. Ground visibility is good because the understory vegetation completely burned in the fire. The most common site type found in this survey area included 11 small structure sites. One eagle trap was discovered on Boundary Peak and other site types found include 1 lithic/sherd scatter and 1 agricultural terrace site.

Survey Area 2: This survey area is located on a pinyon-juniper covered mesa southeast of Boundary Peak and survey area 1. It is bounded on the west by the Dome Trailhead, on the south by the BAS boundary and Capulin Canyon to the east. The west portion of the survey area burned in the fire and the east portion did not. Ground visibility appeared better in the burned portion of the survey area. Out of the eight sites recorded for this area, the survey recorded six small structure sites, one lithic scatter, and one checkdam site.

Survey Area 3: This survey area is located near the headwaters of Red Canyon and sits on a pinyon-juniper covered slopes. It is a very rigorous and difficult hike to this survey area. The reason for this is that it is a steep climb up and down Boundary Peak. The Dome fire burned very hot through most of the survey area except in the southeast portion of the burn area where it burned lightly. Ground visibility was excellent for this area and will not be as good until another fire burns through. The survey recorded 15 sites consisting of 7 small and unknown structures, 1 rock alignment, 3 lithic scatters, and two pueblos.

Survey Area 4: This survey area borders Turkey Springs trail on the north, Red Canyon to the west and a tuff covered ridge to the east. The Dome Fire burned in a mosaic pattern throughout the survey area: predominantly lightly, in some areas moderately and not at all. Ground visibility remained good throughout the entire survey area. The survey recorded 18 sites: 14 small and unknown structures, 2 lithic scatters and two lithic and sherd scatters. LA #3831 was recorded within this survey area. Nearby to Survey Area 4, we recorded one rock art site within red canyon and one on the edge of yellow canyon (See Figure 2). Lastly we re-recorded LA 3830 located on the west rim of Red Canyon. Two unrecorded sites were found within and just outside the survey area. The two sites have not been exposed to GPS locational units but have been hand plotted on Figure 2

Survey Area 5: This survey area is located in the southern edge of the park on the mesa above and east of Capulin Canyon. It is bounded by Hondo Canyon to the east, the trail to the south and Capulin to the west. Ground visibility was good because the pinyon-juniper vegetation was sparse on the tuff rockland mesa. This is the only survey area where the fire burned around it. The crew only surveyed the top of the mesa—not on the slopes up to the mesas. The survey recorded five sites consisting of 3 lithic and sherd scatters and two small structures.

This table shows the area surveyed, the acreage surveyed, the number of sites recorded in each area and their respective LA numbers.

Table 1

Survey Area	Acreage Surveyed	Number of Sites Recorded	LA Numbers
1	82	14	115139, 115140, 115141, 115142, 115145, 115146, 115147, 115148, 115154, 115155, 115156, 115157, 115158, 115160.
2	60	8	115119, 115143, 115144, 115149, 115150, 115151, 115152, 115153.
3	117.34	15	115124, 115125, 115126, 115127, 115128, 115129, 115130, 115131, 115132, 115133, 115134, 115135, 115136, 115137, 115161.
4	67.01	18 new and 1 previously recorded site	115102, 115103, 115104, 115105, 115106, 115107, 115109, 115110, 115111, 115112, 115113, 115114, 115115, 115116, 115117, 115118, 115120, 115121, 3830.
5	16.59	5	115095, 115096, 115097, 115099, 115100.

BASP crews recorded 60 out of 71 new sites within 5 survey areas. They also re-recorded one site (3830) in Area 4. The 1996 DFAP and BASP archeologists recorded 11 of the 71 sites (Table) located outside of the five survey areas. They found these sites

while walking to known sites to complete their damage assessment survey. In addition, they recorded one site near area 4 (3831). See Figure 3.

Figure 2

Location	Site Numbers	Preliminary Site Record	BAS Site record	Number of sites
Upper Capulin	115164, 115138	Yes		2
Lower Capulin	115098, 115162			2
Hondo Canyon	115163		Yes	1
Turkey Springs	115165	Yes		1
Near Area 4	115108, 115122, 115123, 3831.		Yes	4 new sites 1 previously recorded site
Near Area 5	115101		Yes	1
Near Area 5	115159	No		1

The 1996 DFAP crew recorded five sites, 115127, 115138, and 115139, 115164, and 115165 using a preliminary site record form. The DFAP teams used this preliminary site record form to save time in recording the site. The intention was to document important attributes of the site before further recording could be pursued. The preliminary recording form consisted of the following fields: site description, site location, GPS locations, a brief artifact description, and names of people recording it and a sketch map.

Isolated Occurrences

Crews identified 10 Isolated Occurrences within and nearby to the five survey areas. They recorded some of these I.O. in survey areas and on the landscape walking to survey areas (See Table 3 for Isolated Occurrences table). The BASP crew recorded seven projectile point as isolated occurrences. Other isolated finds include a lithics, groundstone and sherd scatter, cairns or a rock alignment.

Table 3

I.O. Number	Type of I.O.	Location
96-1	Archaic Obsidian Projectile Point (whole)	Area 4: East Rim of Red Canyon
96-2	Historic Cairn	Lower Capulin
96-3	Obsidian Projectile Point (missing part base and part tip)	Turkey Springs
96-4	Chert sm. Projectile Point (whole)	West Rim of Capulin Canyon on Jeep Trail.
96-5	Obsidian sm. Projectile Point (partial)	West Rim of Capulin Canyon on Jeep Trail.
96-6	Basalt biface preform (partial)	East Rim of Capulin Canyon. on Jeep Trail.
96-7	Obsidian Projectile Point (missing part base and part of the tip)	Area 2: North of LA 115151
96-8	Corner notched Obsidian Projectile Point (Intact)	Area 4
96-9	Rock Alignment	Near Area 4
96-10	Sherds, flakes, metate	Area 3

Highlights of the Survey

Lithic Scatters

The survey recorded 9 lithic scatters and 5 lithic and sherd scatters during the course of the project. Most of the lithic only sites yielded indeterminate dates except for 115116 and possibly 115101. Because of the abundance of groundstone and large cores and the absence of masonry architecture and ceramics, crews noted that these two sites may be archaic.

115101

This site is located in the sand dunes just below the lower Alamo trail-Capulin trail. Expansive self-standing tent rocks are located to the east. The site is 45 meters east and west and 60 meters north and south. Groundstone fragments litter the entire site (8 metate fragments, 5 hammerstones, 3 manos and 3 mano fragments) as does large basalt cores.

115116

LA 115116 is a large lithic scatter located on a mesa above Red Canyon. The site is comprised of archaic projectile points, groundstone, large flakes, possible hearths and a possible unknown structure. Diagnostic points recovered indicate the archaic period. The survey observed seven fragments and whole points, and collected five (one of the points appears to be a bajada point).

Eagle Traps

The survey recorded only one eagle trap (LA 115157) that is located on the top of Boundary Peak. The peak is composed of a tuff rockland. The prehistoric inhabitants excavated the bedrock in order to construct a rectangular pit. Eagle traps are common in rock outcrops on mesas and peaks.

Cavates

The survey recorded only one cavate structural site, LA 115163. The survey crew found this site while working with 1996 DFAP crews assessing fire damage on previously recorded sites. This cavate site is located on the east side of Hondo Canyon and remained unburned. One room is visible, and plaster still remains on a section of wall that is four courses high. Most of the other walls have eroded downslope. The architectural stone at first glance appeared to be shaped stone. But we noticed that a columnar tuff outcropping is located adjacent and south of the site. It is likely that the tuff rock was quarried from this outcropping. A rock art panel is associated with the cavate and is comprised of anthropomorphic, geometric, and zoomorphic figures. Viga holes and a niche are also associated with the cavate structure. The date of site occupation cannot be determined, only two glaze ware body sherds were found.

Rock Art Sites

The survey recorded 3 rock art sites (115098, 115122, and 115123). LA 115122 and 115123 are located in and near to Red Canyon. 115098 is a small boulder in lower Capulin Canyon with petroglyphs carved onto the face of the rock. LA 115122 is an overhang with one anthropomorph carved into the backwall.

115123

This site consists of 36 petroglyph panels carved into a tuff rock ledge that is 80 meters long. Along this tuff ledge are 3 small structures, 1 rockshelter, 1 cist, 5 niches and a prehistoric trail. The petroglyph panels include masks, anthropomorphs, curvilinear figures, awaynus, shalako figures, kokopellis, crosses and horses. Shalako figures are usually related to the Zuni pueblo.

Small Structures

The most common site type found in the survey area is small structures. Of the 71 sites recorded within all five survey areas, 39 were small structures. In Area 4, 14 classic period small structures are concentrated within 67 acres. The nearest classic period pueblo (60 rooms) is located one mile to the west at the rim of Capulin Canyon. Further research in this survey area is recommended to test recent models proposed by Preucel and Snead.

Preucel has tested a model of variable agricultural settlement for subsistence farmers that incorporated seasonal circulation in the northern portion of the Pajarito Plateau. Small structures in Preucel's scenerio served as seasonal residences for Ancestral Puebloan farmers during the growing season and would have resided at more permanent village sites during the remainder of the year. Changing conditions of subsistence stress would introduce variability in size, number and locations of seasonally occupied sites. It would be interesting to test the three stages of mobility that are proposed in Preucel's research model.

Snead's community dynamics model, the idea that agricultural production was organized at the level of the individual family with little or no decision making taking place at the community level would also be interesting to consider as a further research subject near and in this survey area.

Pueblos

The survey only recorded 4 pueblos- two newly discovered pueblos (LA 115133 and 115137) both found in Area 3 and two previously recorded pueblos (3830 and 3831) found in Area 4. LA 115133 is a coalition component only and 115137 has a coalition and a classic period component. The small structures that are located nearby to the pueblo are classic period sites.

8. Results of Site Treatments

The Dome Fire burned in a mosaic pattern and archeologists determined that only forty-five out of sixty-nine sites newly recorded sites burned during the Dome Fire. They also discovered that data potential may be threatened, if fire effects are not mitigated on twelve sites. The hydrologist recommended that the DFAP archeologists implement preservation treatment on these 12 sites immediately to mitigate further erosion caused by

the Dome Fire. DFAP archeologists, a hydrologist, a horsepacker and his assistant implemented preservation treatments on these 12 sites that consisted of the following:

- 1) Reseeding the sites with native grasses, and then putting mulch on top of the seed.

The DFAP team hand seeded the site with a 50/50 mix of side-oats grama and sand drop seed. The objective of reseeded is to establish a fine root-mat to further bind fine grained soils. The vegetation will grow back and erosion will be mitigated. The DFAP team mulched the site with excelsior fabric in order to stabilize fine-grained soils, reduce soil temperatures that provided an infiltration point for surface moisture.

- 2) Backfilling stumpholes on three sites

The DFAP team filled the stumpholes with native materials taken from areas off-site in order to prevent collapse and erosion of these holes. The stumpholes are cavities left when dead tree roots are completely consumed by fire.

- 3) Removing fuel off one site

The DFAP team removed fuels to reduce fuel loads on sites in order to prevent further fire damage in the event of future fires.

- 4) Placing log deflectors on four sites.

The DFAP team placed log deflectors upslope of site features across water paths to divert runoff away from imperiled features.

- 5) Placing log terraces on two sites.

The DFAP team placed log terraces across the flowpath in order to slow run-off velocity and provide an infiltration point for surface moisture.

Table 3: Site Treatments

M&M Improve Treatments	First Growing Season (M&M)	M&M First Year	Log Deflectors	Log Terraces	Fuel Removal	Backfill Stump Cavities (NS)	NS Re move debris jams	Mulch Pine Needle (NS)	NS Mulch Excelsior	Revegetation	site number
									Yes	Yes	115119
	Yes	Yes	Yes						Yes	Yes	115124
	Yes	Yes	Yes						Yes	Yes	115130
									Yes	Yes	115138
	Yes			Yes				Yes	Yes	Yes	115139
	Yes								Yes	Yes	115145
	Yes					Yes				Yes	115146
Yes	Yes		Yes	Yes			Yes		Yes	Yes	115148
Yes	yes					Yes			Yes	Yes	115152
	yes					Yes				Yes	115160
			yes							Yes	115161
Yes	Yes				yes				Yes	Yes	115162

* (M & M) = Monitor and Maintain

9. Conclusion:

The 1996 BASP archeologists surveyed 376 acres (in five distinct survey areas) within the Dome Fire perimeter. They recorded 71 new sites consisting of 39 small structures, 9 lithic scatters, 5 lithic and sherd scatter, 3 rock art sites, 6 unknown structures, 1 cavate structure with rock art, 1 eagle trap, 4 checkdams, alignments, and terraces, 2 pueblos and 1 potdrop. Only forty-five of the 69 sites were burned in the Dome Fire; 7 sites were heavily burned, 12 sites were moderately burned and 25 sites were lightly burned. The 1996 DFAP teams treated twelve sites that sustained fire damage so it would mitigate the information potential of the site that may be threatened. The 1996 DFAP team implemented the treatments, they did not impact the site with ground disturbing activities.

Appendix 1: List of 70 sites recorded by the 1996 Bandelier Archaeology Project

LA #	Site Type	Survey Area	Dates	Site Burned	Type Of Burn	Site Treated	UTM
115095	Lithic Scatter	Area 5	Unknown	No	N/A		382151E 3952495N
115096	Small Structure	Area 5	Unknown	No	N/A		381962E 3952495N
115097	Pot Drop And Lithic Scatter	Area 5	1225-1350	No	N/A		382038 E 3952449N
115098	Rock Art	Near Area 5	Unknown	Yes	Complete		381677E 3951913N
115099	Small Structure	Area 5	Unknown	No	N/A		381776E 3952721N
115100	Lithic and sherd Scatter	Area 5	Unknown	No	N/A		381964E 3952572N
115101	Lithic Scatter	Near Area 5	Unknown (Archaic)	No	N/A		382147E 3951821N
115102	Small Structure	Area 4	1315-1425	No	N/A		378937E 3956461N
115103	Small Structure	Area 4	1315-1490	No	N/A		378900E 3956454N
115104	Unknown Structure	Area 4	1315-1450	No	N/A		378907E 3956303N
115105	Unknown Structure	Area 4	1315-1425	Yes	Partial		379070E 3956607N
115106	Small Structure	Area 4	Unknown	Yes	Partial		379080E 3956247N
115107	Small Structure	Area 4	1315-1450	Yes	Partial		379145E 3956607N
115108	Unknown Structure	Near Area 4	1315-1400	Yes	Partial		379320E 3954994N
115109	Small Structure	Area 4	Unknown	Yes	Partial		379008E 3956314N
115110	Small Structure	Area 4	1175-1425	Yes	Partial		379158E 3956257N
115111	Small Structure	Area 4	Unknown	Yes	Partial		379144E 3956220N
115112	Small Structure	Area 4	Unknown	No	N/A		379127E 3956083N
115113	Lithic and sherd Scatter	Area 4	Unknown	No	N/A		379099E 3956121N
115114	Small Structure	Area 4	1315-1425	Yes	Partial		379266E 3956131N
115115	Small Structure	Area 4	1315-1425	No	N/A		379292E 3956008N
115116	Lithic Scatter	Area 4	Archaic	No	N/A		378947E 3956220N
115117	Small Structure	Area 4	1315-1425	No	N/A		379220E 3956347N
115118	Lithic And Sherd Scatter	Area 4	1150-1325	Yes	Complete		379252E 3956347N
LA #	Site Type	Survey Area	Dates	Site	Type Of	Site	UTM

		Area		Burned	Burn	Treated	
115119	Small Structure	Area 2	1425-1490	Yes	Complete	Yes	378424E 3958476N
115120	Lithic Scatter	Area 4	Unknown	Yes	Partial		379249E 3956501N
115121	Small Structure	Area 4	1315-1425	Yes	Partial		379223E 3956501N
115122	Rock Art	Near Area 4	Historic	No	N/A		378369E 3955778N
115123	Rock Art	Near Area 4	Unknown	No	N/A		378768E 3956575N
115124	Small Structure	Area 3	Unknown	Yes	Complete	Yes	377674E 3957570N
115125	Small Structure	Area 3	1300-?	Yes	Complete		378254E 3957177N
115126	Unknown Structure	Area 3	1300-?	Yes	Partial		378077E 3957228N
115127	Small Structure	Area 3	Unknown	No	N/A		377796E 3957323N
115128	Alignment	Area 3	Unknown	Yes	Complete		377721E 3957321N
115129	Small Structure	Area 3	Unknown	Yes	Complete		377657E 3957614N
115130	Unknown Structure	Area 3	Unknown	Yes	Complete	Yes	377712E 3857590N
115131	Lithic Scatter	Area 3	200-1100	Yes	Partial		378003E 3957572N
115132	Small Structure	Area 3	1315-1425	Yes	Partial		378186E 3957543N
115133	Pueblo	Area 3	1150-1325	No	N/A		378385E 3957415N
115134	Lithic Scatter	Area 3	Unknown	No	N/A		378218E 3957228N
115135	Small Structure	Area 3	1325-1450	Yes	Complete		378207E 3957594N
115136	Lithic Scatter	Area 3	Unknown	Yes	Partial		378219E 3957469N
115137	Pueblo	Area 3	1150-1450	Yes	Complete		378097E 3957594N
115138	Terraces	Capulin Canyon	Unknown	Yes	Complete	Yes	378828E 3959343N
115139	Small Structure	Area 1	1400-1450	Yes	Complete	Yes	377769E 3959285N
115140	Lithic and sherd scatter	Area 1	Unknown	Yes	Partial		377814E 3958960N
115141	Small Structure	Area 1	Unknown	Yes	Complete		377853E 3958985N
115142	Small Structure	Area 1	1250-1490	Yes	Partial		377824E 3959203N
115143	Small Structure	Area 2	1325-1425	No	N/A		378816E 3958230N
LA #	Site Type	Survey Area	Dates	Site Burned	Type Of Burn	Site Treated	UTM

115144	Small Structure	Area 2	1315-1450	No	N/A		379008E 3958346N
115145	Small Structure	Area 1	1315-1425	Yes	Complete	Yes	377842E 3959349N
115146	Small Structure	Area 1	Unknown	Yes	Complete	Yes	377990E 3959073N
115147	Small Structure	Area 1	Unknown	Yes	Partial		377517E 3959626N
115148	Small Structure	Area 1	1400-1490	Yes	Complete	Yes	377598E 3959400N
115149	Small Structure	Area 2	1325-1450	Yes	Partial		378451E 3958311N
115150	Small Structure	Area 2	1325-1450	Yes	Partial		378915E 3958323N
115151	Lithic Scatter	Area 2	Unknown	No	N/A		378886E 3958408N
115152	Small Structure	Area 2	1315-1425	Yes	Complete	Yes	378500E 3958403N
115153	Checkdam	Area 2	Unknown	Yes	Partial		378496E 3958487N
115154	Small Structure	Area 1	1325-1425	Yes	Complete		377985E 3958998N
115155	Terraces	Area 1	Unknown	Yes	Complete		377567E 3959477N
115156	Lithic and sherd Scatter	Area 1	1325-1425	Yes	Complete		377944E 3959390N
115157	Eagle Trap	Near Area 1	Unknown	Yes	Partial		377427E 3958516N
115158	Small Structure	Area 1	1400-1450	Yes	Complete		377560E 3959155N
115159	Lithic Scatter	Near Area 5	Archaic	No	N/A		382406E 3952005N
115160	Small Structure	Area 1	Unknown	Yes	Complete	Yes	378007E 3958891N
115161	Small Structure	Area 3	Unknown	Yes	Complete	Yes	378001E 3957639N
115162	Small Structure	Near Area 5	Unknown	Yes	Complete	Yes	381005E 3953267N
115163	Cavate Structure/ rock art	Near Area 5	1325-?	No	N/A		382331E 3952573N
115164	Unknown structure	N/A	Capulin	Yes			None
3830	Pueblo	Near Area 4	1175-1325	No	N/A		
3831	Small Structure	Near Area 4	1325-1425	No	N/A		

Appendix 2

Site Treatment Descriptions:

Listed below are newly recorded sites that have fire effects damage. I describe the site type, the fire damage incurred on the site, the preservation treatments implemented and how we mitigated the fire damage on a site by site description.

115119

This site consists of a small structure that was filling with sediments. The sediments were washing in from above the structure and would ultimately undercut the wall causing it to collapse. The DFAP team seeded and mulched the site with excelsior fabric in order to re-establish the natural seed bank and prevent soil loss. The treatment also prevents progressive filling of the structure and rill/gully formation. No soil disturbance occurred on this site.

115124

This site consists of a small structure. The Dome Fire destroyed all the effective soil cover and re-activated gullies on either side of the site. Cultural fill was eroding out of the structure. In order to prevent this erosion, the DFAP team seeded and mulched the site and placed four log deflectors above the structure in order to divert overland run-off away from the structure.

115130

This site is a small structure. It is located in a high intensity burn area on a watershed with a high sediment yield. This would scour the fill within the structure, thus destroying its integrity. To prevent this erosion, the DFAP team re-seeded the site with side-oats. They also placed two log diverters upslope and off site in order to divert overland run-off into the existing drainages.

115138

The site consists of several agricultural terraces that were completely burned over by the Dome Fire. The DFAP team placed log terraces above and upslope of the site. They also strip-mulched the site with excelsior fabric on thirty foot spacing in order to slow the velocity of overland run-off. No soil was displaced during this treatment as the log terraces were simply placed on the surface. The log terraces were only slightly effective, as they were not properly bedded. The strip mulching, however, was highly successful at retaining soils and reducing the velocity of overland run-off.

115139

This site, a small structure, was threatened by raindrop erosion (raindrop splash could loosen fill inside the structure and undermine its stability). Treatment was two-fold; it consisted of 1) re-seeding and mulching with pine needles and 2) placing log terraces on the flow path above the structure in order to impede overland run-off. In spite of these terraces being located within the site boundaries, no cultural material was disturbed during treatment.

115145

This site consists of a small structure that was filling with sediments. The sediments were washing in from above the structure and would ultimately undercut the wall causing it to collapse. The DFAP team seeded and mulched the site with excelsior fabric in order to re-establish the natural seed bank and prevent soil loss. The treatment also prevents progressive filling of the structure and rill/gully formation. No soil disturbance occurred on this site.

115146

This site, a small structure, was impacted by complete loss of effective soil cover, one wind-thrown root-wad and a burned-out stump cavity. The structure was also threatened by overland run-off. DFAP crews stabilized this structure by backfilling both of the cavities and mulched the flow path with pine needles. gathered the pine needles from the canyon floor. No sub-surface deposits were impacted during this treatment.

115148

The Dome Fire consumed all of the effective soil cover (E.S.C.) on the small pueblo site as well as the watershed above the structure. This re-activated the gullies on either side of the site. DFAP team noted the migration of artifacts into the gullies and the loosening and migration of fill by rain-drop impacts.

In order to stop soil loss from the site as well as the watershed, the DFAP team re-seeded the area with sand drop-seed and side-oats grama. The structure was mulched with excelsior fabric and the off-site watershed was extensively terraced using standing-dead ponderosa. This was done in order to slow overland run-off and limit gully activity.

Additional work consisted of clearing gullies of debris (this keeps run-off in the channels and prevents the channels from migrating towards site features) and removal of three hazard trees which threatened structural integrity.

115152

This site consists of a small structure located on a small knob overlooking Capulin canyon. Due to its location, hydrological impacts were not a threat, as the site itself constitutes the watershed. However a large standing dead juniper had burned out leaving a large yet, partial stump cavity. The juniper carcass was also still standing and would destroy intact masonry when it fell. To eliminate these threats the stump was filled with non-cultural material taken from off site and the juniper carcass was removed. Additional work consisted of placing excelsior fabric within the structure in order to reduce soil temperature and retain moisture. The entire site was seeded with sand drop-seed and side-oats grama. This site was tested in June 1997 as part of the D.F.A.P. Sub-surface Heating Effects study.

115160

This site consists of a small structure that was completely burned over by the Dome fire. The native needle layer was consumed leaving inadequate ground cover. If

left untreated rainfall would initiate soil loss that would adversely affect the site features. In order to prevent soil loss, litter would have to be replaced, therefore, the flow-path to the site was mulched with pine litter gathered from off-site. Two stumpholes were also filled using native soil. The site was also re-vegetated using a 50-50 mix of side-oats grama and sand drop-seed. The goal of this treatment was to stabilize the flow path to prevent damage to site features by overland run-off. No ground disturbing activities took place either on or off site during treatment.

115161

This site consists of a small structure that was completely burned as a result of the Dome Fire. In order to prevent overland run-off to impact the structure, dead fall was placed directly above the feature to direct flow into the adjacent drainage. Although the deflector was placed next to the structure care was taken to insure that no intact soil was displaced. Cobbles were taken from off site in order to retain the diverted.

115162

This site, a small structure, was impacted by a high intensity burn both within and adjacent to the structure. Because of the lack of effective soil cover, the fine-grained soils were prone to erosion via raindrop impacts. In order to stabilize the fill it was necessary to replace the natural stabilizers that were lost in the fire. This was done by mulching with excelsior fabric and reseeding with side-oats grama and sand drop-seed. No soil was disturbed either on or off site.

Figure 4. Dome Fire Archeology Project: Newly Recorded Sites

