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Edited by
LouAnn Jacobson and June-el Piper

CULTURAL RESOURCES SERIES NO. 10, 1992

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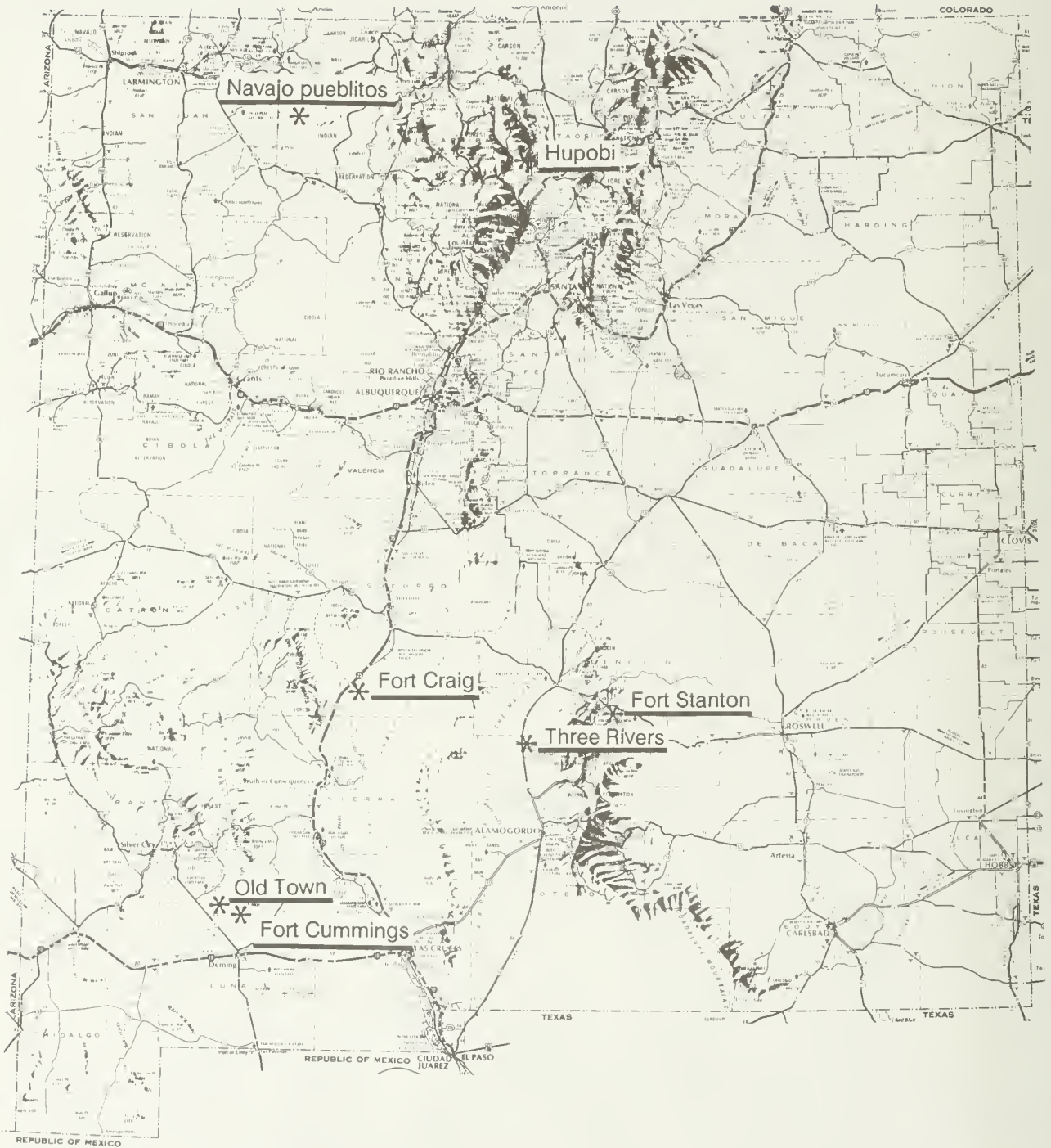
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Project locations.

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Table of Contents

Contributors	iii
List of Illustrations	vii
List of Tables	viii
Foreword	ix
1. Archaeology and Paleoecology of the Fort Stanton Reservation near Lincoln, New Mexico	<i>Phillip H. Shelley</i> 1
2. Research at Old Town Ruin, a Mimbres Site in Luna County, New Mexico	<i>Darrell G. Creel</i> 21
3. The Archaeological Society of New Mexico's Rock Art Recording Field School at Three Rivers Petroglyph Site	<i>Helen K. Crotty</i> 31
4. Archaeological Research at the Pueblo IV Ruin of Hupobi	<i>Stephen E. Glass and Janice Baker Glass</i> 45
5. Dating the Dinetah Pueblitos: The Tree-Ring Data	<i>Ronald H. Towner</i> 55
6. Archaeological Investigations at Fort Cummings	<i>Edward Staski</i> 73
7. Archaeological Investigations at Fort Craig	<i>Peggy Gerow</i> 87

List of Illustrations

Project locations	ii
1.1 Fort Stanton Reservation and archaeological site locations	3
1.2 Average pollen proportions of selected taxa from modern local plant communities and combined paleo woodrat midden samples	5
1.3 Pollen concentration values from paleo woodrat midden samples	7
1.4 Pollen percentages from paleo woodrat midden samples	8
1.5 Site map and locations of test excavations, Upper Bonito I, 1988 and 1991	10
1.6 Excavations in Test Area 1 at Upper Bonito I	11
1.7 Excavations in Test Area 2 (1991) at Upper Bonito I	12
1.8 Schematic representation of chronological and stratigraphic relationships between Test Area 1 and Test Area 2	13
2.1 Map of Old Town showing principal remains and the 1989–1991 excavations	22
2.2 Plan of the Classic Mimbres architectural remains found in the Unit 1 excavations in Area A	24
2.3 Contour map of Area B showing location of 1989–1991 excavations and principal features	26
2.4 Plan of Unit 5 excavations in Area B	27
3.1 Map of New Mexico showing location of Three Rivers Petroglyph Site	34
3.2 Preliminary map of Three Rivers Petroglyph subsites	35
3.3 Pin flags marking boulders to be recorded	37
3.4 Petroglyph representing the most common category, random pecking or scratches	37
3.5 Recording a petroglyph	37
3.6 Circles, the most common geometric element at Three Rivers	41
3.7 Elaborated circle ringed by exterior dots	41
3.8 Complex geometric design	41
3.9 A complex geometric design incorporating life forms	42
3.10 Graffiti dated 1925	42
3.11 Animal figure apparently damaged in an attempt to remove it from the underlying rock	42
4.1 Site map, Hupobi (LA 380)	46
4.2 Hupobi petroglyph	47
4.3 Sampling units at Hupobi	49
5.1 Location of the Dinetah Dating Project	56
5.2 Distribution of all tree-ring dates collected by the Dinetah Dating Project	62
5.3 Distribution of cutting dates from the Dinetah Dating Project	63
5.4 Construction episodes in the Dinetah	66
6.1 Fort Cummings: main fort, north	74
6.2 Excavated structure in main fort, south	75
6.3 Standing adobe walls in main fort, south	76
6.4 Stone wall structure in main fort, south	77
6.5 Fort Cummings cemetery	78

List of Illustrations (continued)

6.6	Stage station	79
6.7	L-shaped complex	80
6.8	Fort Cummings circa 1886	82
7.1	Plan of Fort Craig, 1866. The main gate is at the top; the western soldiers' quarters is the uppermost of the three contiguous buildings on the left	88
7.2	Aerial view of Fort Craig	89
7.3	Union soldiers on parade at Fort Craig circa 1865–1868	90
7.4	Fort Craig commanding officer's quarters, 1990	91
7.5	Topographic map of Fort Craig	92
7.6	Remains of a square-toed Officer's boot dating to post-1872	93
7.7	Locations of data recovery units in the area of the front gate (Study Units 0–4) and the western enlisted men's quarters (Study Units 5–12)	95
7.8	Jefferson Davis, or Hardee, hat pin usually worn on light artillery dress between 1855 and 1872	96

List of Tables

1.1	Results of woodrat midden radiometric analyses	6
1.2	Radiocarbon dates from three sites on the Fort Stanton Reservation	9
1.3	Ceramic types recovered from dated contexts at Upper Bonito I	14
1.4	Portion of lithic sample recovered from dated contexts at Upper Bonito I	15
1.5	Faunal remains from dated contexts at Upper Bonito I	16
1.6	Temporal and elevational distribution of dated sites on the Fort Stanton Reservation	17
3.1	Three Rivers design element tally sheet	38
3.2	Rock art supplement to Laboratory of Anthropology site form	39
4.1	Comparison of ceramic assemblages, Hupobi and Howiri	50
5.1	Pueblito site tree-ring data	59

Foreword

For several years the New Mexico Bureau of Land Management has provided support to universities, volunteer nonprofit organizations, avocational archaeologists, and students wishing to conduct research on public lands. Cooperative Agreements are currently in place for research and data recording at Fort Cummings, Fort Craig, the Three Rivers Petroglyph Site, the Old Town archaeological site, Fort Stanton, Hupovi, and the Navajo pueblitos. Because this work is making a substantive contribution to archaeology, we organized a symposium for the 1992 Society for American Archaeology meetings in Pittsburgh. The purpose of the symposium was to disseminate to the profession the research goals and results of these cooperative projects. The symposium demonstrated the interest the New Mexico BLM has in supporting research on public lands and the benefits that can result from partnerships between federal land managers, researchers, and others interested in protecting and interpreting cultural resources.

The sites being investigated represent human occupation dating from one hundred to one thousand years ago, reflecting the variability and significance of New Mexico's archaeological and historical resources. These sites reflect the challenges a land managing agency must face when attempting to protect archaeological sites whose condition ranges from pristine to severely vandalized. The integration of BLM goals for site management, interpretation, and protection with the project partner's goals for education, research, and public participation provides unique training opportunities for project participants. These papers clearly demonstrate how successful and mutually beneficial these cooperative projects can be.

These papers primarily represent status reports of ongoing work; additional field seasons are planned at Fort Stanton, Fort Craig, and Old Town. Final reports are being prepared for the work conducted by the Wilderness Studies Institute at Hupubi Pueblo, by New Mexico State University at Fort Cummings, by the Archaeological Society of New Mexico at Three Rivers Petroglyph Site, and by Ronald Towner at the Navajo pueblitos. These final reports will be published as future volumes in the New Mexico BLM Cultural Resources Series.

We would like to thank all of the authors for their participation in the SAA symposium and their dedication to educating students and the public concerning the value of our cultural heritage and cultural resource management. We would also like to thank the symposium discussants, Dr. Wirt Wills of the University of New Mexico and Dr. Stephen Lekson of Crow Canyon Archaeological Center, for their generous and supportive comments in Pittsburgh.

LouAnn Jacobson
Stephen Fosberg
Series Editors

Archaeology and Paleoecology of the Fort Stanton Military Reservation near Lincoln, New Mexico

Phillip H. Shelley

Fort Stanton was established 14 km northwest of Lincoln, New Mexico, to provide local settlers with protection from the Mescalero Apaches (Gorney 1969:5). After the Mescaleros surrendered in 1896 the military reservation was no longer considered necessary and in 1899 Fort Stanton was transferred to the Marine Hospital Service for use as a tuberculosis center for merchant seamen (Gorney 1969:56). The fort also served as the first internment camp for Germans during World War II (Gorney 1969:83). In 1953 the fort was transferred to the New Mexico Department of Public Welfare (Gorney 1969:87) and the remainder of the military reservation was turned over to the Bureau of Land Management.

The Rio Bonito Archaeological Project was established in 1987 as a joint multiyear research and teaching project of the Bureau of Land Management (BLM), New Mexico State Office, and Eastern New Mexico University. The cooperative agreement established an ongoing scientific research and training program to address questions of regional significance, to provide a variety of training experiences for graduate and undergraduate archaeology students, and to provide the BLM with information for planning and interpretive purposes (Shelley 1987, 1991). The project also provides research opportunities for graduate students (Aguila n.d.; Coleman 1991b; Salzer 1992a, 1992b). Collection of the preliminary information presented here is the first step toward the accomplishment of long-term research goals described briefly in the following section.

Research Orientation

The theoretical orientation for the Rio Bonito Archaeological Project is best described as a contextual framework (Butzer 1982; Hassan 1985; Schiffer 1976). In this approach, efforts to understand the role that the local depositional environment plays in the formation of the archaeological record guide our data collection strategies. In other words, the context of archaeological materials (the environment, both in the past and since then) is as important as the content (the artifacts and features, and associations between them) in any discussion of strategies for ecological adaptation. When the dimension of time is added, via the analysis of datable materials, the ultimate goal of understanding cultural changes can be approached. The research focus established under the cooperative agreement includes paleoenvironmental reconstruction, studies of local depositional environments, inquiries into land-use patterns, evaluation of prehistoric subsistence activities, and characterization of past social and demographic conditions. This orientation led to the identification of a number of specific research activities (Shelley 1987).

In order to define land-use patterns and changes in these patterns through time, survey information is being gathered on the number and variety of sites in the project area. In addition, a refined chronology, including a series of artifact associations and an understanding of local depositional sequences, was deemed necessary in order to cross-date sites more precisely and to evaluate contemporaneity. In order to place the prehistoric occupations in their paleoenvironmental context, information is being collected on present and past vegetational, hydrological, faunal, and climatological patterns. Data on the sources and distributions of mineral resources (for the manufacture of both lithic and ceramic artifacts) are being collected in order to assess local and regional social interaction. Because the Fort Stanton Military Reservation is a recent geopolitical entity with boundaries that reflect historical rather than prehistoric occupations, the cooperative agreement and the research design clearly recognize and accommodate the need to gather data outside the project area's boundaries.

Setting

The Rio Bonito Archaeological Project is located on the Fort Stanton Military Reservation in south-central New Mexico (frontispiece). The reservation lies to the east of the Sacramento Mountains, within view of both the Sierra Blanca range and the Capitan Mountains. To the west the Hueco and Tularosa basins separate the region from the Rio Grande province, and the Pecos Valley to the east separates the region from the Southern Plains.

The reservation encompasses approximately 69 km² along the lower reaches of the Rio Bonito (Figure 1.1). The Rio Bonito is a semiperennial stream with headwaters on the slopes of Sierra Blanca to the southwest. The Bonito is one of the principal eastward-flowing streams that drain the Sacramento Mountains (Sprankle 1983). The stream runs through relatively dry uplands, although the modern floodplain supports a disturbed and invaded riverine community.

Since the Pleistocene, the Rio Bonito has incised a relatively deep and, in places, relatively broad canyon into San Andres limestones and Hondo sandstones. Geomorphological research indicates that the valley bottom has experienced repeated flooding episodes in historical times as well as several lateral shifts in the main channel's position (Fred Nials, Desert Research Institute, personal communication 1991). These processes have resulted in the removal of deposits in the narrower parts of the cañon and the deposition of sediments and changes in landforms in the broader sections of the valley.

The reservation lies within the Upper Sonoran life zone (Holen 1984). The local piñon-juniper-oak woodland community includes piñon pine (*Pinus edulis* Englem.), alligator-bark juniper (*Juniperus deppeana* Steud.), one-seed juniper (*J. monosperma* Engelm.), gambel oak (*Quercus gambelii* Nutt.), wavyleaf oak (*Q. undulata*), and ponderosa pine (*Pinus ponderosa* Doug.) and infrequently limber pine (*P. flexilis* James). Mountain mahogany (*Cercocarpus montanus* Raf.), prickly-pear (*Opuntia* sp.), yucca (*Yucca* spp.), grape (*Vitis* sp.), and various grasses (Poaceae) are locally present. On the reservation, higher elevations are dominated by piñon pine, mid-elevations by a mix of the major trees, and lower elevations are basically a juniper-grassland community. Near the course of the Bonito, other native trees, such as walnut (*Juglans major* Berland. or *J. major* Torr.), box-elder (*Acer negundo* L.), Osage orange (*Machura pomifera* Raf.), and cottonwood (*Populus* sp.), are present (Coleman 1991a, 1991b; Holloway 1991).

The fauna on the reservation includes most species usually associated with the Upper Sonoran life zone (Holen 1984). Large mammals currently found in the project area include mule deer (*Odocoileus hemionus*) and pronghorn (*Antilocapra americana*). Smaller mammals that are relatively abundant include porcupine (*Erethizon dorsatum*), coyote (*Canis latrans*), beaver (*Castor* sp.), and skunk (*Mephitis* sp.). A wide variety of small rodents are abundant, including field mice (*Mus* spp.), woodrats (*Neotoma* spp.), pocket gophers (*Geomys* spp.), ground squirrels (*Citellus* spp.), and rabbits (both *Lepus* sp. and *Sylvilagus* sp.). Avian fauna is dominated by raptors (*Accip-*

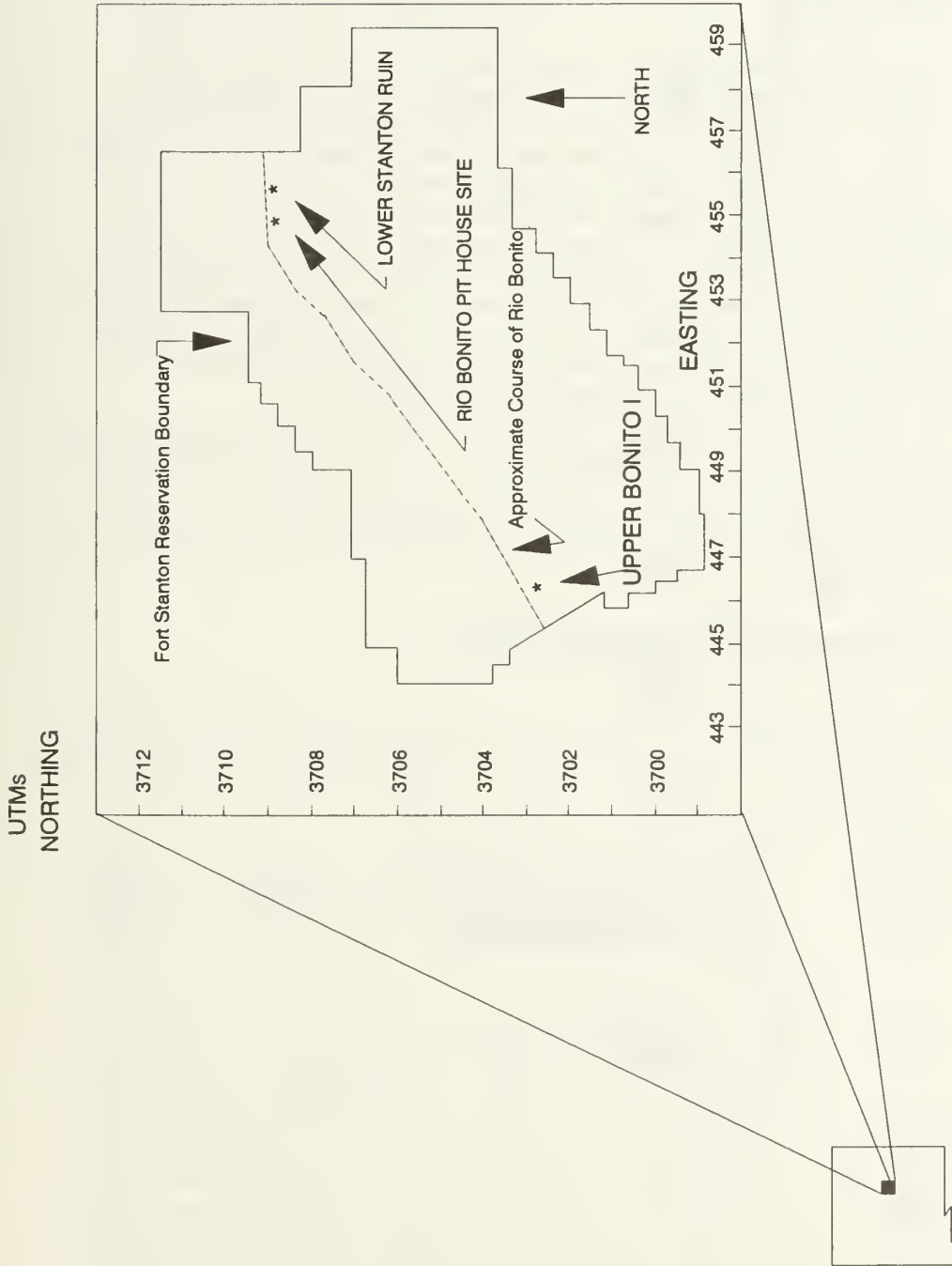


Figure 1.1. Fort Stanton Military Reservation and archaeological site locations.

ter and *Buteo* sp.) and crows (*Corvus brachyrhynchos*) with an occasional sighting of wild turkey (*Meleagris gallopavo*).

Research Activities

In an effort to acquire samples of artifacts and associated macrobotanical samples and materials suitable for dating, test excavations encompassing 16 m² were completed on each of three sites in 1988. Also completed in 1988 were a survey for paleo woodrat middens, an evaluation of local lithic resources, and the collection of some basic geomorphological and sedimentological data. In 1991 the Rio Bonito project completed an additional 40 m² of excavations at one site and initiated an archaeological survey of the northwestern highlands of the reservation.

In all field seasons, locational and topographic information was collected using a Lietz total station theodolite equipped with an electronic distance meter. Students and staff maintained field journals on computers, and all sample information was input into a data management system in the field. Aerial photographs were used to map modern and paleo geomorphology and to determine areas for nonsite sediment or soil profile collections. Modern flora and surface pollen data were collected using the relevé method (Mueller-Dombois and Ellenberg 1974).

Artifacts and ecofacts were analyzed after the field session as part of undergraduate laboratory courses or by graduate assistants. Additional analyses were completed by faculty members. Special analyses, such as radiocarbon, ethnobotanical, and dendrochronological studies, were completed by established commercial or institutional laboratories. All analytic data, including field-collected spatial information, were stored and manipulated using a wide variety of computer programs (e.g., REFLEX, PARADOX, dBASE, SURFER, AND SYSTAT).

Modern and Paleoenvironmental Data

Thirty-seven modern vegetation stands on the reservation have been examined and described using established techniques (Mueller-Dombois and Ellenberg 1974). In addition, pollen samples from the surface of these stands were collected and analyzed (Holloway 1991). The average pollen proportions for selected taxa by community type are shown in Figure 1.2. These data provide an analog for understanding the fossil (“woodrat”) pollen assemblage.

Eight “amberized” woodrat middens have been dated and analyzed. These middens span the period from around 1800 B.C. through the mid-A.D. 1600s (Table 1.1). Although the early and middle portions of this period are not well represented, a more continuous record has been collected from the period between A.D. 1200 and the mid-1600s. All of the middens contained large amounts of pollen. Concentration values for individual middens range from 5000 grains per gram to an astounding 95,000 grains per gram (Figure 1.3). The relative frequencies of all pollen taxa recovered from the midden samples are shown in Figure 1.4. Comparison of fossil pollen frequencies with those from modern pollen samples reveals the following interesting trends.

By around A.D. 900 the area appears to have supported an established piñon-juniper woodland with a strong grass component (compare pollen frequencies of midden RB 10 in Figure 1.4 with pollen frequencies from modern piñon-juniper communities in Figure 1.2). The absence, or scarcity, of other taxa suggests a stable environment dominated by these three taxa prior to the first intensive occupation of the area. By around A.D. 1200 the paleoclimatic record shows an increase in *Pinus* pollen, which may indicate slightly more moist local conditions (Hall 1985). The likelihood of this interpretation is strengthened by the increase in *Acer* and *Quercus* taxa. The fossil pollen sample for the mid-1200s supports an interpretation of continuing relatively mesic conditions in the area. The comparatively high frequencies of *Pinus*, *Acer*, and *Quercus* taxa support this interpretation. Increased frequencies of Chenopods and high-spine Asteraceae at this time appear to contradict the interpretation of mesic conditions; however, the lack of low-spine Asteraceae and

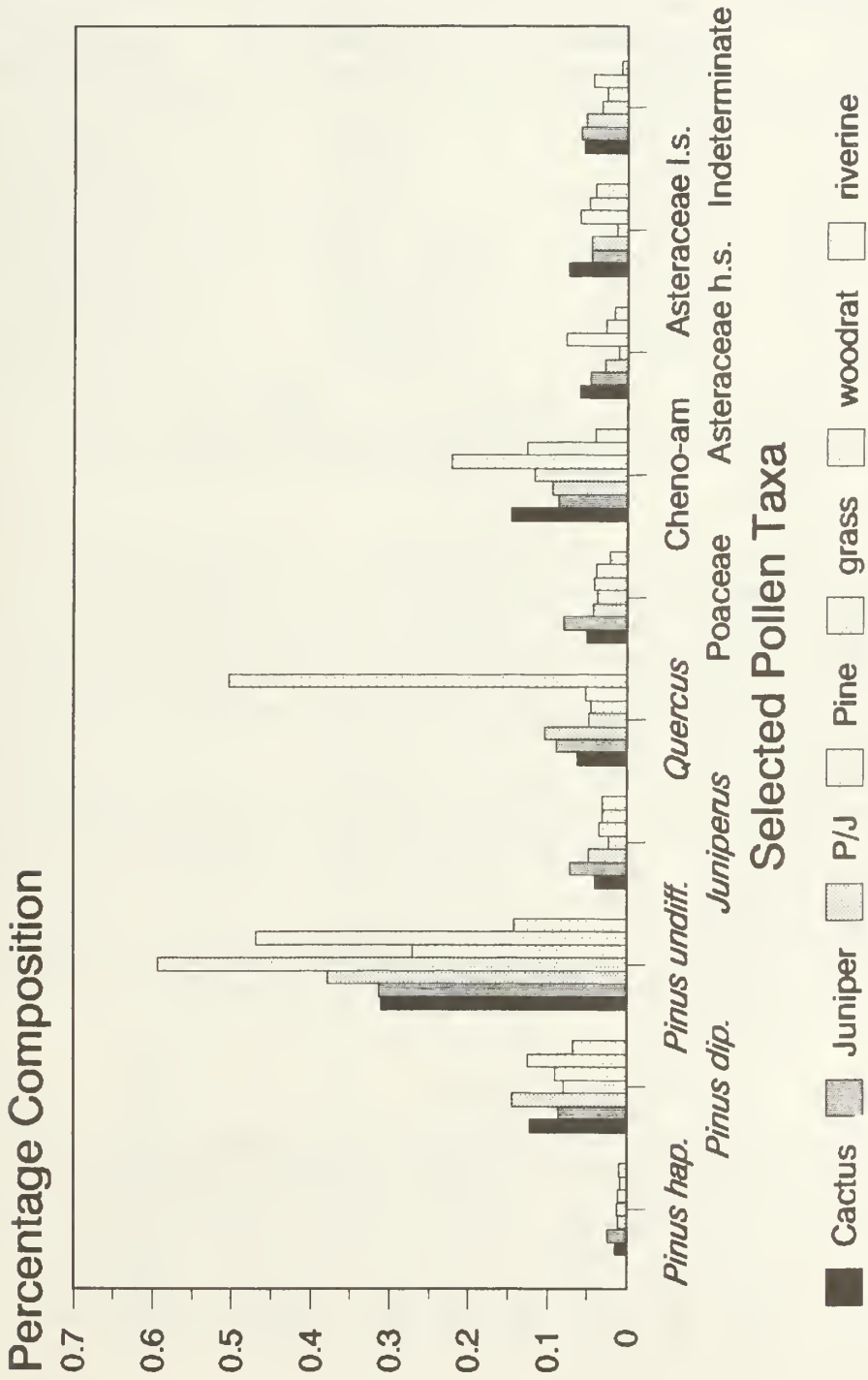


Figure 1.2. Average pollen proportions of selected taxa from modern local plant communities and combined paleo woodrat midden samples. *Pinus* (haploxyton) is piñon pine; *Pinus* (diploxyton) is ponderosa and other pines; *Pinus* (undiff) grains could not be differentiated.

Table 1.1. Results of woodrat midden radiometric analyses, Rio Bonito Archaeological Project.

Sample Number	C13-Adjusted C14 Years B.P.	Calibrated Mean Age	Age Range With One Sigma
RB 01	260 ± 90	A.D. 1648	A.D. 1494–1955
RB 07	320 ± 80	A.D. 1525	A.D. 1450–1653
RB 03	500 ± 80	A.D. 1422	A.D. 1329–1444
RB 04	700 ± 70	A.D. 1280	A.D. 1260–1385
RB 02	770 ± 140	A.D. 1261	A.D. 1069–1385
RB 10	1120 ± 60	A.D. 898	A.D. 782–987
RB 06	3240 ± 100	1518 B.C.	1684–1416 B.C.
RB 05	3540 ± 100	1885 B.C.	2031–1740 B.C.

Note: All dates from midden organics; all radiocarbon analyses performed by Beta Analytic, Inc.; dendrochronological calibration followed methods outlined by Stuiver and Pearson (1986).

Artemisia strongly suggests that the rise in high-spines and Cheno-ams reflects human disturbance – possibly horticultural activities – rather than a decrease in local precipitation.

By the late 1200s *Zea mays* pollen appears in the fossil record for the first time (Coleman 1991a:18). At this time the riverine community appears to be relatively well established, as indicated by the presence of *Salix*, *Populus*, and an increase in *Quercus* pollen. At the same time, however, the decrease in *Pinus* pollen may reflect the onset of dry conditions affecting the vegetation communities on the ridges.

By A.D. 1422 the area may have become more xeric. This interpretation is based on the substantial decrease in juniper pollen. Alternatively, the drop in juniper pollen may indicate local deforestation as a result of around 500 years of human occupation. The valley bottom apparently continued to support a rich riparian community, as indicated by the steady frequencies of *Acer* and *Quercus*, an increase in *Salix*, and the appearance of *Juglans* pollen.

In the 1500s the postabandonment record indicates a relatively arid local situation. This interpretation is based on the decrease in pollen concentration values in almost every taxon. A similar dry period has been noted at the nearby Garnsey Bison Kill Site (Hall 1984). This dry period appears to have ended by A.D. 1648.

Archaeology

The Rio Bonito Archaeological Project has performed test excavations, analyses, and dating of three sites: Lower Stanton Ruin, Upper Bonito I, and Rio Bonito Pit House Village (Figure 1.1). These three sites span a period from roughly A.D. 1000 through 1400 (Table 1.2). An apparent hiatus is evident between approximately A.D. 1200 and 1400 when the calibrated mean ages are considered. Whether this gap reflects local abandonment or sampling error is difficult to evaluate at this time. All three sites are structural sites and appear to have been the locus of domestic activities, although the large pitstructure at Upper Bonito I (Test Area 1) may have served other functions during the late 900s. Most of the excavations to date have been carried out at Upper Bonito I, and it is the results of these investigations that are discussed here.

Upper Bonito I was first described by Jelinek (1952). The site is located approximately 120 m south of the Rio Bonito at an elevation of around 2000 m above sea level. The site is situated on a fluvial terrace at the interface of the terrace and an alluvial fan. Today the site supports a juniper-

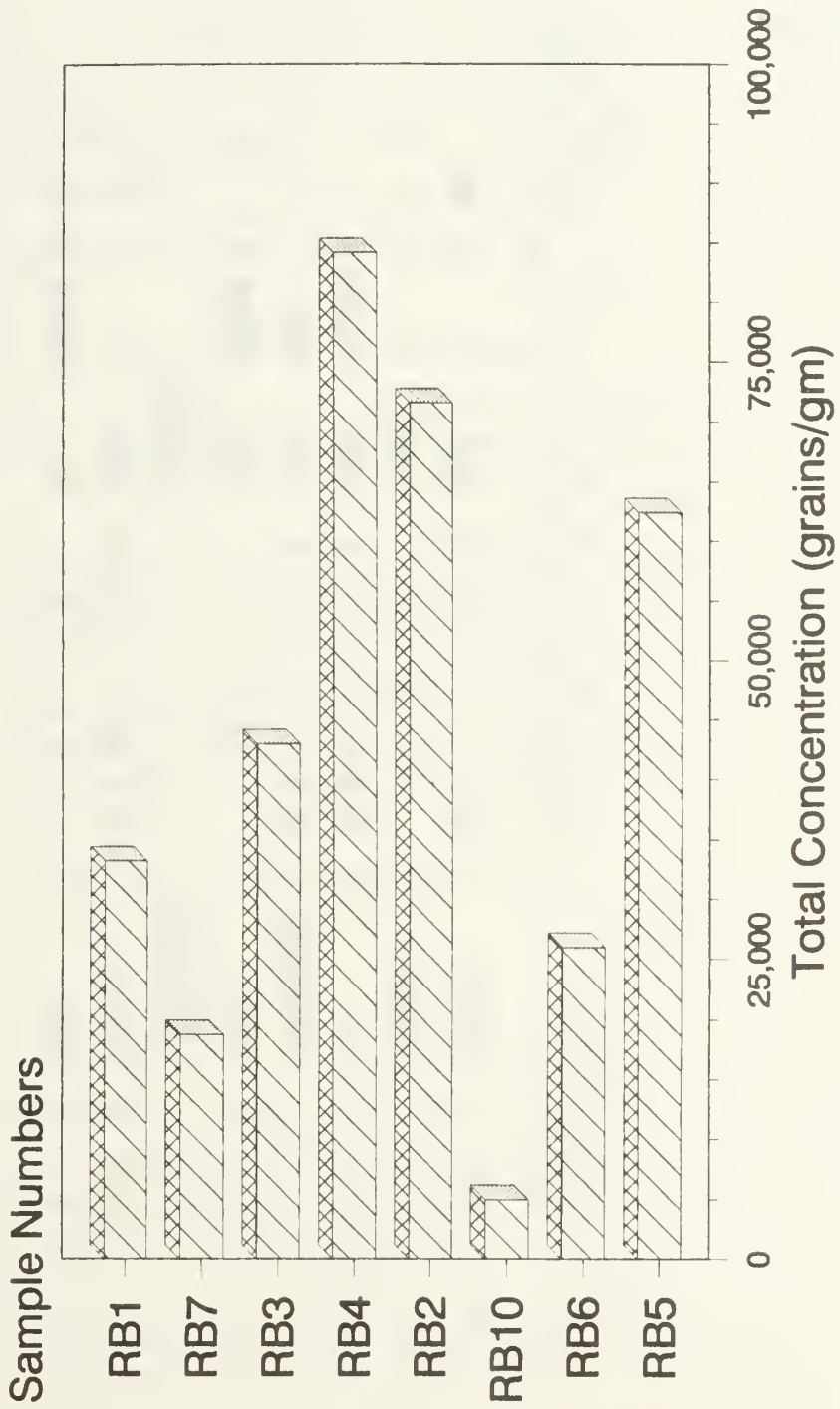


Figure 1.3. Pollen concentration values from paleo woodrat midden samples.

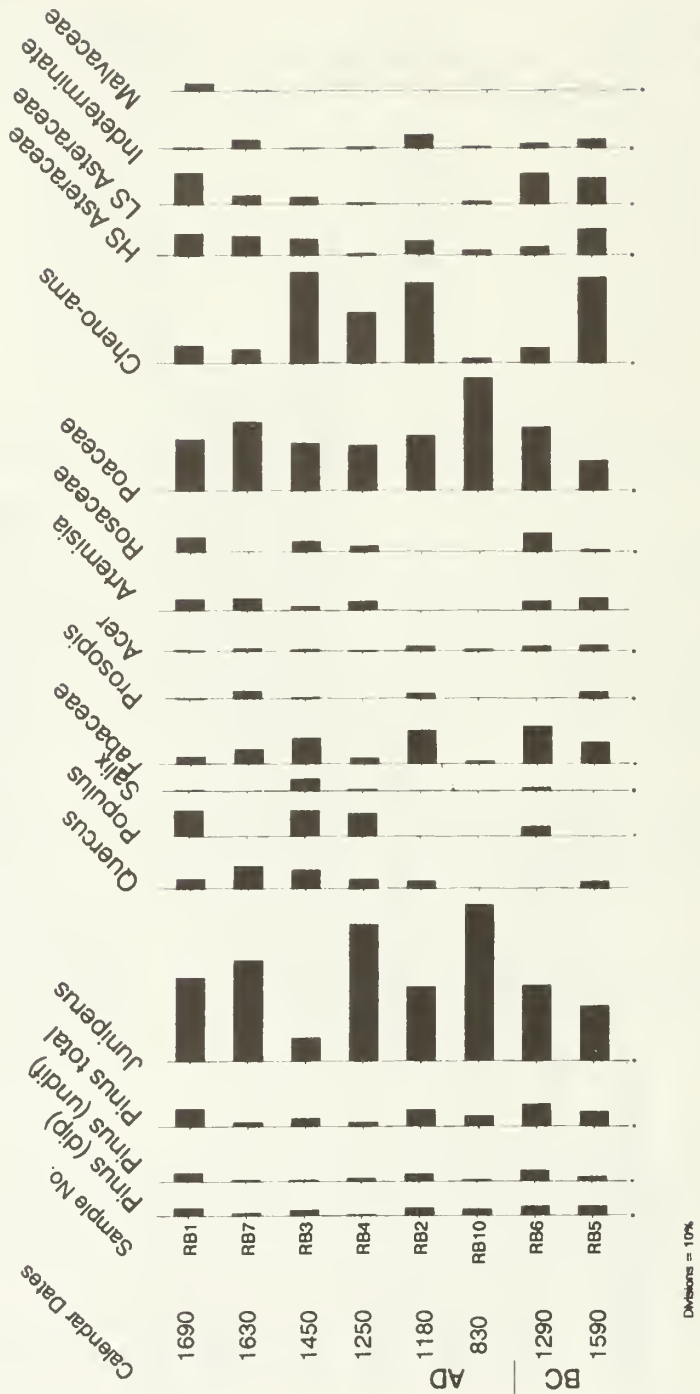


Figure 1.4. Pollen percentages from paleo woodrat midden samples.

Table 1.2. Radiocarbon dates from three sites on the Fort Stanton Reservation.

Site/Context	C13-Adjusted C14 Years B.P.	Calibrated Mean Age	Age Range With One Sigma
Pit House Site/Trash	1070 ± 90	A.D. 980	A.D. 886–1024
Upper Bonito Test Area 1/ Roof Support	1050 ± 60	A.D. 991	A.D. 900–1021
Upper Bonito Test Area 1/ Trash	890 ± 60	A.D. 1163	A.D. 1034–1221
Upper Bonito Test Area 2/ Roof Support	860 ± 70	A.D. 1182	A.D. 1043–1253
Lower Stanton Ruin/ Roof Support	550 ± 70	A.D. 1404	A.D. 1305–1431

Note: All dates from carbonized wood; all radiocarbon analyses performed by Beta Analytic, Inc.; dendrochronological calibration followed methods outlined by Stuiver and Pearson (1986).

grassland vegetation community. Surficial archaeological materials include a large, diffuse artifact scatter; a large depression; and some scattered boulder concentrations (Figure 1.5). Based on surface ceramic types reported by Jelinek, Kelley (1984:302) tentatively places this site in her Lincoln phase, ca. A.D. 1200–1400.

Test excavations at Upper Bonito I were initiated in 1988 and continued in 1991. Three areas of the site were selected for sampling: the large depression, the boulder concentrations, and an area between these features (Figure 1.5). The limited excavations performed at the site in 1988 produced a sample of artifacts and charcoal for radiocarbon dating but did not provide information on relationships between structures or macrobotanical remains. Consequently, further excavations were carried out at the site in 1991.

The following discussions concentrate on two areas of excavation. Test Area 1 encompasses several 2 by 2 m contiguous excavation units that bisect the surface depression (Figure 1.6); ca. 15 m² was excavated in 1988 and 1991. The area designated “Test Area 2 (1991)” on Figure 1.5 consists of similar contiguous excavation units in a boulder concentration approximately 44 m west-northwest of Test Area 1 (Figure 1.7); in this area, ca. 25 m² was excavated.

The results of investigations suggest that Upper Bonito I is a multicomponent site. Excavations in Test Area 1 revealed the remains of a large pitstructure approximately eight meters in diameter. The size of this pitstructure indicates that it may have served an integrative function. The temporal placement of this structure at around A.D. 1000 is based on a radiocarbon date from a roof support post collected at floor level (Table 1.2). In addition, the nature of the sediments and artifacts found in the pit fill indicates abandonment and natural filling of the pitstructure (Figure 1.8). Both radiocarbon dates and stratigraphic relationships suggest that the rest of the site area was not occupied during the period when the pitstructure was in use. Relatively few artifacts were found on or near the floor of this structure. Those that were recovered from living surface contexts appear to have been on the roof of the structure when it burned. Most of the artifacts recovered from the fill of the pitstructure came from the upper levels and appear to be trash that was deposited in the depression some time after the structure had been abandoned.

The excavations in Test Area 2 (1991) revealed the remains of a surface structure and associated exterior pits. This structure and associated features appear to date to the middle 1100s. This time frame is consistent with the dates derived from trash deposits in the upper portions of

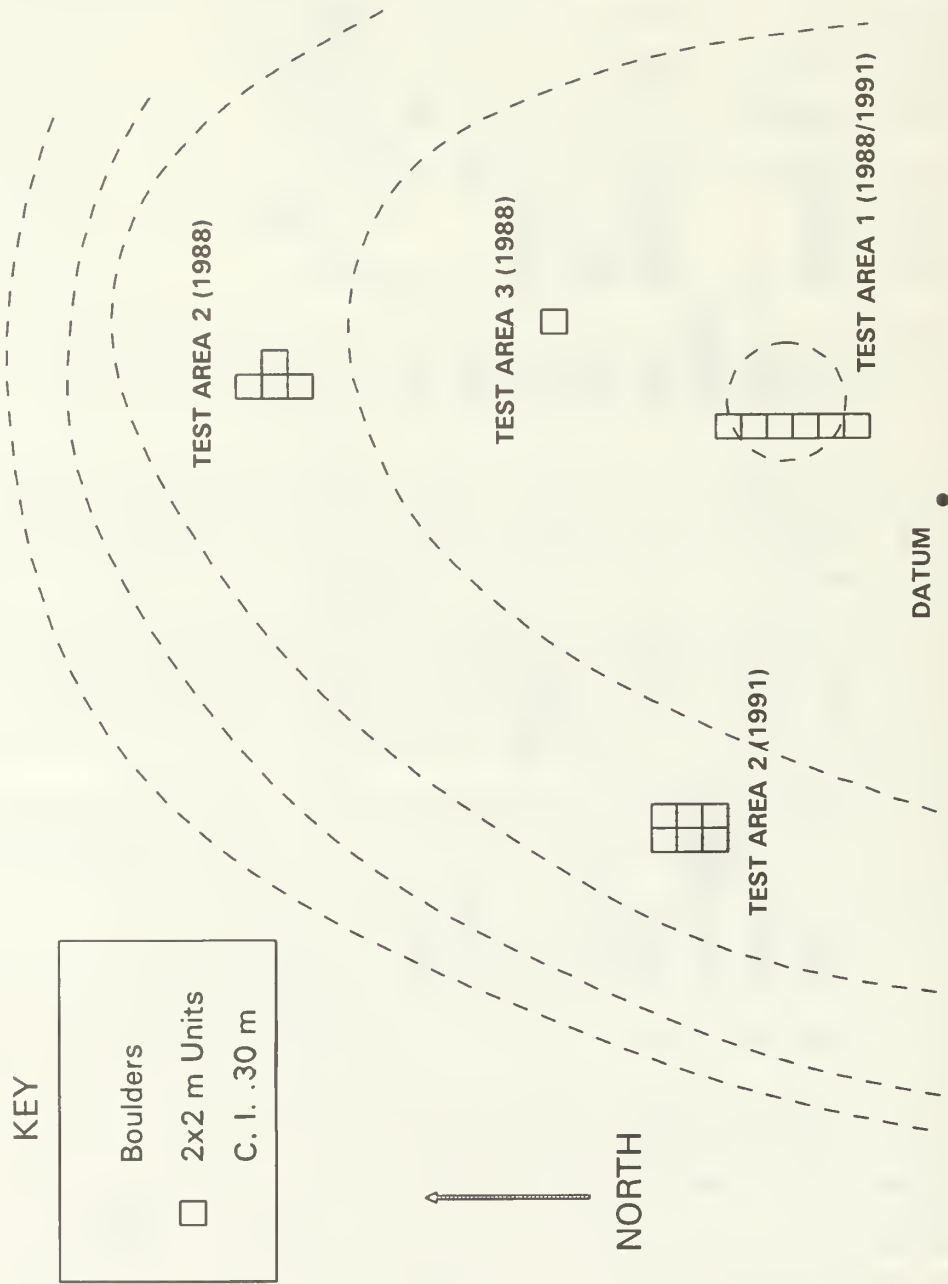


Figure 1.5. Site map and locations of test excavations, Upper Bonito I, 1988 and 1991 (not to scale).

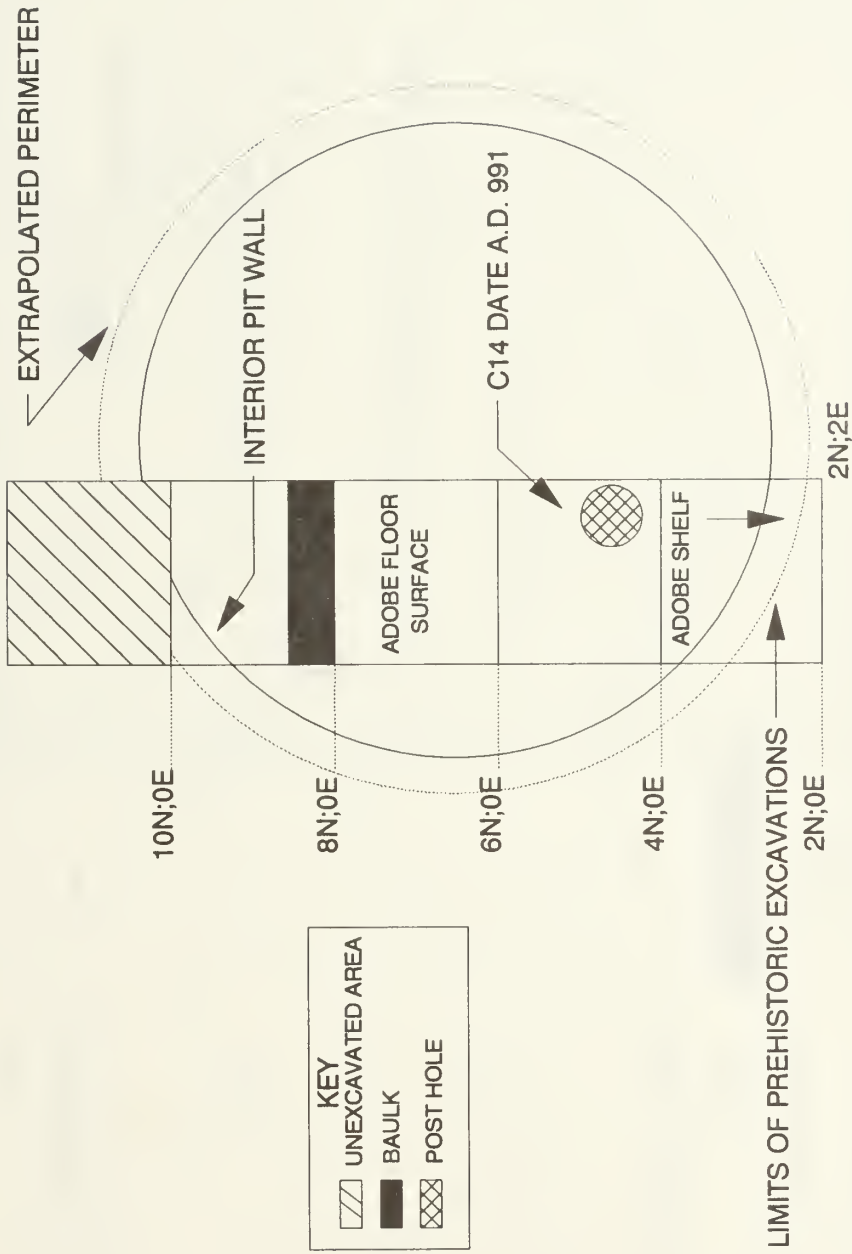


Figure 1.6. Excavations in Test Area 1 at Upper Bonito I.

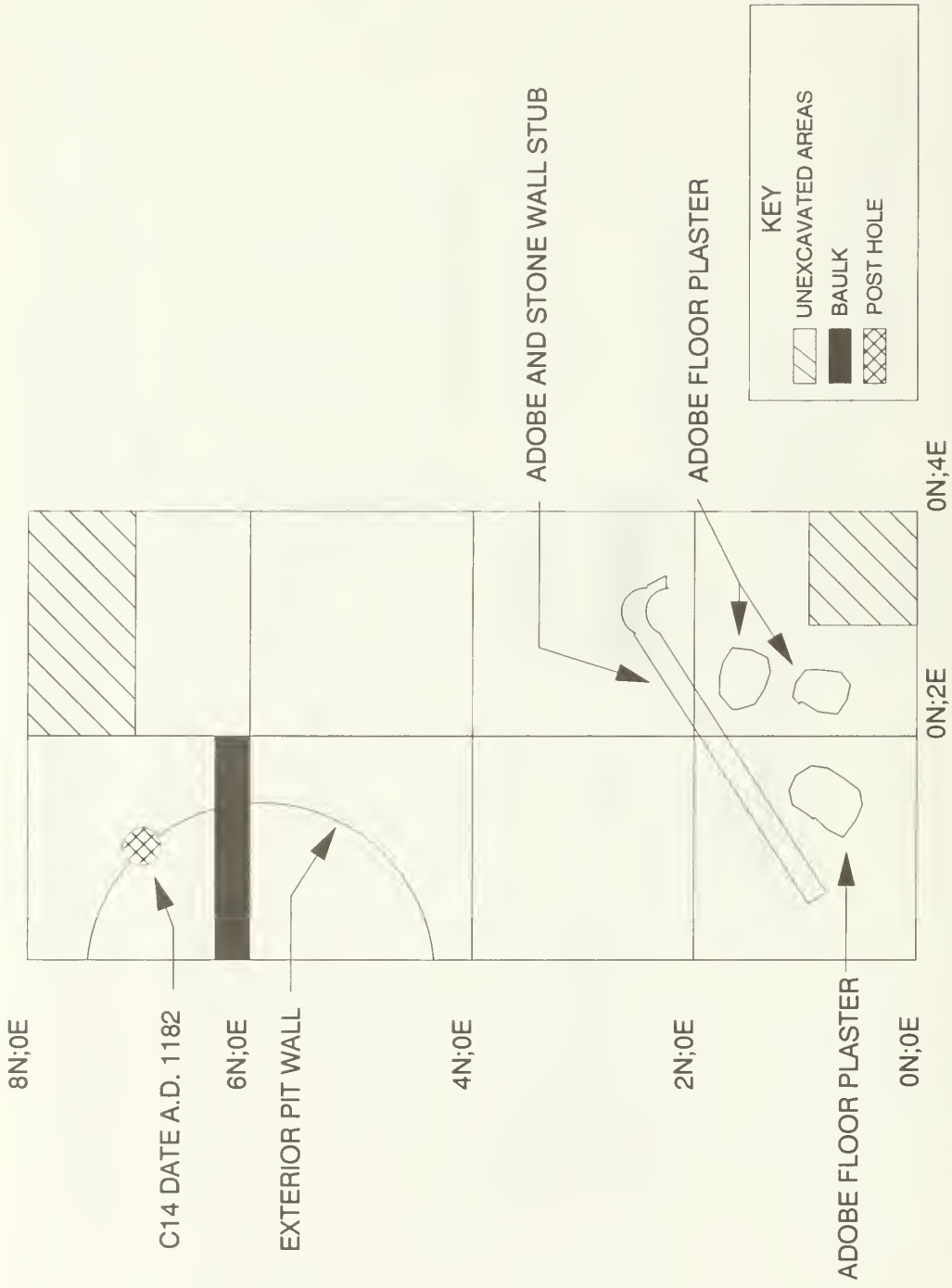


Figure 1.7. Excavations in Test Area 2 (1991) at Upper Bonito I.

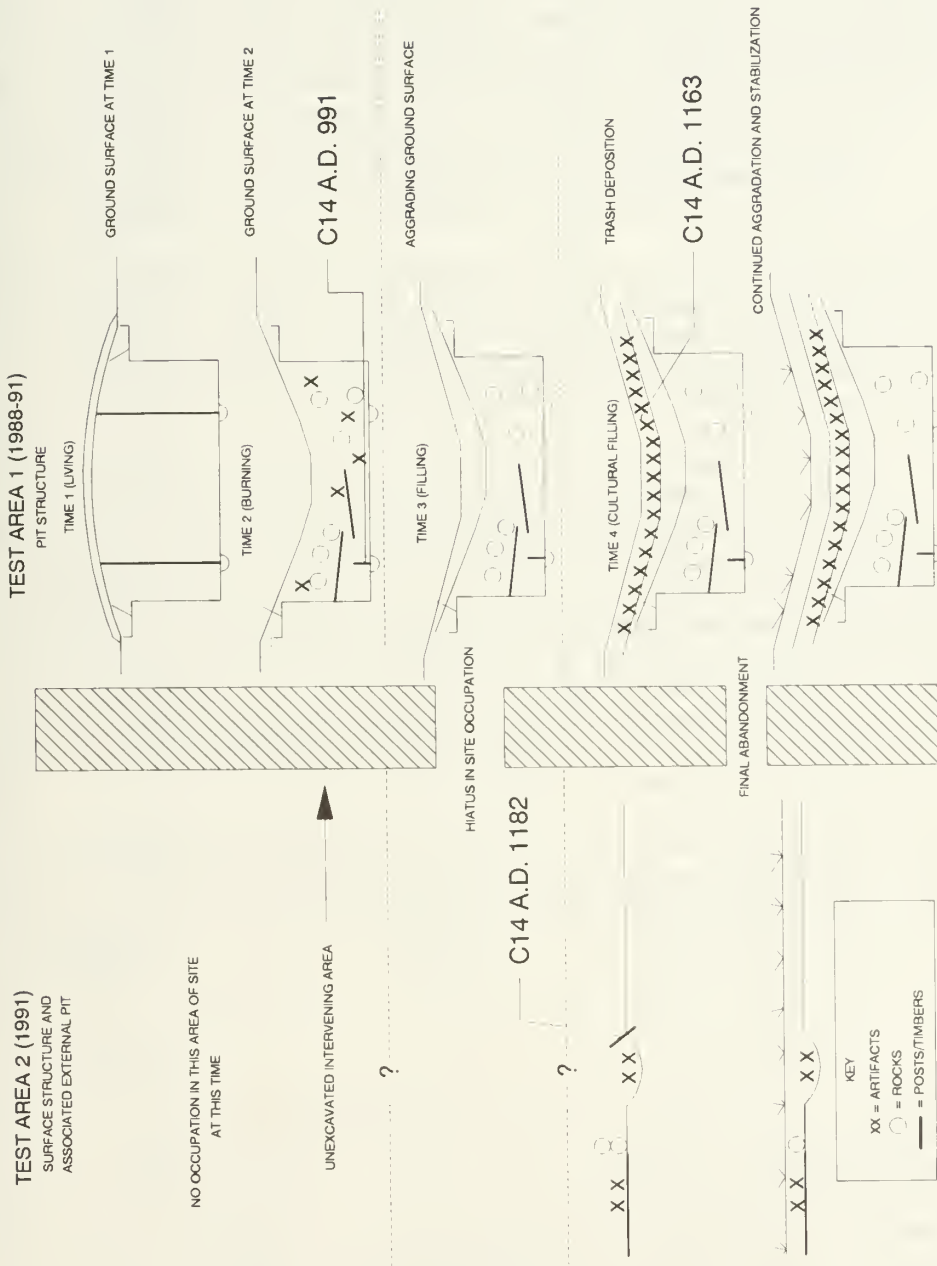


Figure 1.8. Schematic representation of chronological and stratigraphic relationships between Test Area 1 and Test Area 2 (1991) at Upper Bonito I (not to scale).

the pitstructure (Test Area 1). None of the samples submitted for tree-ring dating yielded a result (Robinson 1992).

Many macrobotanical samples were recovered from test excavations at Upper Bonito I. The majority were collected from the pits associated with the mid-1100s surface structure. Remains recovered include domesticated corn and beans as well as many walnut, piñon, and oak nuts (Holloway 1992). Surprisingly little evidence of wild grasses, Chenopodiaceae, or Amaranthaceae was recovered from flotation analyses (Holloway 1992). Of additional interest is the rather abundant occurrence of carbonized horsetail stalks (*Equisetum* sp.). Today, horsetail is only found along the Bonito in areas that are perennially wet. Taken together, these data suggest both the presence of and a reliance on an extensive riverine community in the past. Perhaps the flow of water in the Rio Bonito in the area of Upper Bonito I was more permanent during the period of occupation than it is today. If the horsetail stalks were gathered locally, there may even have been some ponding in the valley bottoms.

The ceramic sample from this site is dominated by brownwares (Table 1.3). The major decorated wares recovered include Chupadero Black-on-white, Three Rivers Red-on-terracotta, El Paso Polychrome, and Jornada Polychrome. The presence of El Paso Polychrome and one sherd of Ramos Polychrome may indicate interaction with populations to the south of the Rio Bonito area; however, the limited size and nature of the sample warrants caution in proposing this type of inference.

A majority of the flaked stone sample recovered from the site is debitage (Table 1.4). Based on the frequency of cortex, most of the debitage is from late-stage manufacturing or tool refurbishing activities. Some initial reduction may also have occurred at the site, as indicated by the moderate frequency of flakes and flake fragments with cortex. The site is relatively close to both primary and secondary lithic deposits; the major lithic raw materials recovered from the site include several varieties of local cherts and quartzites. The site also exhibits relatively high frequencies of flaked igneous materials and limestones. A few pieces of nonlocal obsidian and worked turquoise were recovered from the test excavations. The obsidian is macroscopically similar to materials from northern New Mexico sources, and the turquoise resembles samples collected from historical mine tailings several kilometers upstream on the Bonito. Without trace elemental analysis, however, assignment of these materials to specific sources should be considered tentative at best.

Table 1.3. Ceramic types recovered from dated contexts at Upper Bonito I.

Type	Number	Percent
Jornada Brown	642	39.0
El Paso Brown	453	27.5
Undifferentiated Brownwares	31	1.9
Roswell Brown	15	0.9
Jornada Corrugated	6	0.4
Chupadero Black-on-white	293	17.8
Three Rivers Red-on-terracotta	47	2.8
Jornada Polychrome	25	1.5
El Paso Polychrome	21	1.3
San Francisco Red	15	0.9
Chupadero Glaze	11	0.7
Playas Redware	3	0.2
Ramos Polychrome	1	0.1
Roswell Red-on-brown	1	0.1

Table 1.4. Portion of lithic sample recovered from dated contexts at Upper Bonito 1 (for complete results see Shelley 1991).

CATEGORY	RAW MATERIAL														
	Obsidian	Fine-Grained Basalt	Little Black Peak Basalt	Fine-Grained Andesite	Fine-Grained Gabro	Fine-Grained Granitics	Fine-Silicified Lime-stone	Sand-stone	Ortho-Quartzite	Ortho-Quartzite	Grained Ortho-Quartzite	Undifferentiated Chert	San Andres Form. Chert	Chalcedony	Turquoise
Flakes/Fragments w/o cortex	3	46	6	7	5	30	15	1	16	103	73	38	7	0	0
Flakes/Fragments w/ cortex	0	39	4	5	8	11	21	8	9	39	15	26	1	0	0
Ground stone	0	0	0	2	0	5	1	13	0	5	0	0	0	0	0
Ornament	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Pecking stone	0	3	0	0	0	0	0	0	1	0	1	0	0	0	0
Uniface/Chopper	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Core w/ cortex	0	6	0	0	0	0	0	0	1	1	0	3	0	0	0
Core w/o cortex	0	1	0	0	0	2	1	0	0	0	2	3	0	0	0
Flake tool w/ cortex	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0
Flake tool w/o cortex	1	1	0	0	0	0	2	0	1	0	1	2	0	0	0
Projectile point	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0

The faunal remains recovered from excavations are predominantly those of rodents, many of which probably represent natural matrix inclusions (Table 1.5). Nevertheless, a few elements from large mammals and medium birds were recovered. Virtually all of the remains are fragmentary, and little evidence of burning or charring was observed.

Discussions

These preliminary data from the Rio Bonito Archaeological Project provide information relevant to questions of regional prehistory. Stuart and Gauthier (1981:217–218) have postulated an elevational shift in settlement location in the region in response to changing rainfall patterns. They posit that between A.D. 900 and 1000 habitation sites should be located at relatively low elevations. At around A.D. 1125 they suggest a movement upslope for horticultural/agricultural sites and a return to lower elevations post-A.D. 1270 (Stuart and Gauthier 1981:217–218). Even though Stuart and Gauthier postulate these settlement shifts for the basins adjacent to the Sacramento Mountains, west of the project area, the location of the three radiometrically dated sites along the Rio Bonito generally fits their proposed pattern (Table 1.6). The major exception is the late A.D. 900 date on a roof support post from the large pitstructure at Upper Bonito I. The interpretation that Upper Bonito I was used primarily for other than domestic purposes in the late A.D. 900s may explain its location. Stuart and Gauthier (1981:218) suggest that during periods of shifting rainfall patterns a need would have developed for economic integration between highland and lowland communities. The large pitstructure at Upper Bonito I may have served such a purpose in the late 900s. Without data from other sites that have been documented farther upstream (Jelinek 1952), however, this interpretation should be considered speculative.

Table 1.5. Faunal remains from dated contexts at Upper Bonito I.

Element	Identification	Burned	Portion	Side	Comparable Form
Mandible	Rodentia	No	Partial	Left	?
Crania	Rodentia	No	Partial	?	<i>Geomys</i>
Crania	Rodentia	No	Partial	?	Lagamorph
Proximal ulna	Rodentia	No	Partial	Right	?
Crania	Rodentia	No	Fragment	?	?
Crania	Rodentia	No	Fragment	?	?
Proximal tibia	Aves	No	Fragment	Left	Galliformes
Proximal tibia	Aves	No	Partial	Right	Galliformes
Long bone	Aves	Yes	Fragment	?	Medium bird
Proximal scapula	Aves	No	Partial	Left	Medium bird
Long bone	Aves	No	Fragment	?	Medium bird
Tooth	Artyodactyl	No	Fragment	?	<i>Odocoileus</i>
Tooth	Artyodactyl	No	Fragment	?	<i>Odocoileus</i>
Long bone	Medium mammal	No	Fragment	?	?

Table 1.6. Temporal and elevational distribution of dated sites on the Fort Stanton Reservation.

Site/Context	Dendro-Calibrated Mean Age (A.D.)	Elevation (in meters)
Pit House Site/Trash	980	1840
Upper Bonito Test Area 1/Roof support	991	2006
Upper Bonito Test Area 1/Trash	1163	2006
Upper Bonito Test Area 2/Roof support	1182	2006
Lower Stanton Ruin/Roof support	1404	1853

The carbonized *Zea mays* cobs recovered from Upper Bonito I (from contexts dated to A.D. 1100) are 8- and 12-rowed varieties (Holloway 1992), but no data on kernel morphology are currently available. Most of the corn apparently represents an early flowering eight-rowed variety. Upham and colleagues (1987:416–417) suggest that selection for this type occurred in the Southwest in response to either short growing seasons or variability in the seasonality of precipitation. At the Robinson site, approximately 29 km northwest of Upper Bonito I, Adams (1988:2–4) reports the recovery of predominantly 10- and 12-rowed cobs, with only occasional 8- and 14-rowed cobs. An analysis of more than 100 unburned cobs from Beth Cave, located approximately 11 km downstream from Upper Bonito I (adjacent to the Rio Bonito Pit House site), also revealed a population of primarily 10- and 12-rowed cobs (Adams 1988). Taken together, these data suggest

that part of the local prehistoric response to shifting precipitation patterns may have been relocation of settlements and selection of different varieties of corn.

The wild plant remains recovered from Upper Bonito I are similar to those recovered from the Robinson site, but there are also some marked differences between the samples. Unlike Robinson, Upper Bonito I exhibits relatively little evidence for wild grass and weed seed exploitation (Adams 1988). Also, Upper Bonito I produced remains of acorns, which were absent at the Robinson site (Adams 1988). These differences may result from differences in local hydrological and edaphic conditions as well as from variation in local weather patterns.

Conclusions

After two field seasons, substantial baseline studies have been completed at three archaeological sites on the Fort Stanton reservation. Paleobotanical studies include the dating and palynological analyses of several ancient woodrat middens and macrofossil analyses of several archaeological samples. Geoarchaeological studies that have been completed involve geochemical and particle-size analysis of sediments and soils, an evaluation of local lithic resources availability, and the collection of paleogeomorphological information. A sample of archaeological information has been gathered through both excavation and survey. The results of these activities are detailed in several reports, some of which are still in progress (see the References Cited).

The baseline studies reported here provide an empirical framework for refining our understanding of the prehistory of Fort Stanton Military Reservation. Nevertheless, several spatial and temporal holes still exist in our archaeological, geological, and environmental data. With the continued support of the Bureau of Land Management, we look forward to achieving our long-term research goal of understanding the dynamics of eco-cultural change in the Sierra Blanca region. The continuation of this project will result in well-trained archaeologists as well as an understanding and documentation of the region's prehistory that can be used to meet public and professional interests.

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Research at Old Town Ruin, a Mimbres Site in Luna County, New Mexico

Darrell G. Creel

In the summers of 1989, 1990, and 1991 the University of Texas at Austin and Texas A & M University carried out excavations at the Old Town Ruin (LA 1113) in Luna County, New Mexico. Old Town is in a prominent location overlooking the Mimbres River and has been recognized by archaeologists since early in this century as one of the largest Mimbres communities (Fewkes 1914:10–12). Known to pothunters since before the turn of the century, Old Town has been the scene of unrestrained looting for more than one hundred years (Creel 1992). As a result, it is estimated that well more than one thousand burials have been looted from the site, and the main ruin today looks like a bomb-eratered battlefield (see LeBlanc 1983:black-and white Plate 8).

The basic objective of the 1989–1991 investigations has been an assessment of the research potential of the site. More specifically, we have attempted to determine for the Bureau of Land Management the potential of this heavily disturbed site to yield useful archaeological data.

The site complex has been divided into four major areas (Figure 2.1). Area A comprises the portion of the site that has always been considered the Old Town ruin; it sits atop a cliff at the edge of the Mimbres River bottom and contains the remnants of a large Classic Mimbres pueblo as well as remains of both an earlier, underlying pithouse occupation and a later, Black Mountain phase occupation (see LeBlanc 1983 for discussion of chronological sequence). Area A has been extensively looted over the years, but intact deposits still remain.

Area B lies to the northeast of Area A and, in contrast, has evidently seen only minor disturbance from relic hunters. Relatively little is known of its occupational history, but our excavations to date have yielded primarily Three Circle phase architectural remains.

Area C is located along a narrow ridge that runs south from Area A. These remains seem primarily to be of post-Classic age, but Late Pithouse period remains probably occur as well. Much of the architectural remnants in this portion of the site have been disturbed by relic hunters, but there clearly seem to be areas of intact deposits, both intramural and extramural. Excavations in Area C are planned for the 1992 season.

Area D lies in the Mimbres River floodplain below the cliff on the west side of Area A. An extensive, deep midden deposit occurs along the base of the cliff, and a light concentration of post-Classic debris, perhaps representing a small pueblo, is located on the floodplain some 30–50 m from the cliff.

Investigations in Area A

The 1989 and 1990 investigations focused on Area A in an effort to determine the research potential of its Classic Mimbres remains (Creel 1989, 1990). At the beginning of the 1989 investigations, Area A, pockmarked with countless craters from pothunting, had the appearance of a



Figure 2.1. Map of Old Town showing principal remains and the 1989-1991 excavations.

thoroughly looted ruin. It is now clear, however, that some Classic remains are still preserved in this portion of the site and that at least a general reconstruction of Classic surface architecture is possible. Thus far, excavations have been concentrated primarily in the area adjacent to a bulldozer trench in the northeast portion of the ruin, with limited testing in the central and eastern portions of Area A (Figure 2.1).

Late Pithouse period remains also seem to be fairly common in Area A. Although sampling of these deposits has been limited, they appear to be somewhat less disturbed by pothunting than are Classic Mimbres remains, and we suggest that they are still relatively well preserved throughout much of Area A.

The Late Pithouse period remains in Area A include a nearly square pithouse (Room A5) that was fully excavated except for the entryway, another probable pitstructure that was barely exposed in a profile, and midden deposits within these structures (Creel 1989:4–5). The excavated pitstructure (Room A5) is around three meters on a side and was originally excavated into solid bedrock. Its extended entryway was on the south side and appears to have been sealed off during use. Roof-support postholes were found in the bedrock just beyond the floor. Floor features include a hearth, an ash deposit, and a pair of small, shallow pits interpreted as ladder pole rests; the ladder pole rests presumably relate to a ceiling hatchway installed after the lateral entryway had been sealed. In addition, the skeletal remains of a human infant (Burial 3) were found on the floor in the southwest corner of Room A5.

Overlying the two pitstructures and the midden deposits in and adjacent to them are Classic Mimbres remains that have been extensively disturbed by pothunting. These remains consist primarily of the wall remnants of a Classic room (Room A1), three-fourths of which was destroyed by the bulldozer. The east wall and lengths of around one meter of the north and south walls remain to a height of approximately one meter (Figure 2.2). Pothunting has destroyed the floor and floor features. Based on our excavations and on a tentative correlation with Nels Nelson's 1920 measured sketch map of Old Town, we believe that Room A1 was the northeast corner room in the pueblo during much of the Classic period.

Across the bulldozer trench, in Unit 1C, portions of five Classic Mimbres rooms have been excavated (Figure 2.2). Three had been partially destroyed by bulldozing, and all have suffered considerably from hand-digging. Several wall segments and many other architectural features had already been destroyed, making it difficult to reconstruct the building sequence in this portion of the site.

Nonetheless, we have partially excavated four contiguous and probably contemporaneous rooms (rooms A2, A4, A6, and A7), which appear to date to fairly early in the Classic period. This dating assessment is based on the type of masonry construction and on the lack of Classic ceramics beneath the floor remnant in one room. Pothunting has destroyed most of the floor features, but a few hearths, postholes, and other features were found on remaining floor fragments. Burials were clearly once present but have all been looted from the area thus far excavated.

The fifth room in Unit 1C (Room A3) postdates two of the other four Classic rooms and was probably much smaller (Figure 2.2). It had been almost totally destroyed, but enough was preserved to reveal that the wall between previously existing rooms A2 and A4 had been dismantled and portions of the upper four floor surfaces in Room A2 had been removed, new walls added, and a new floor laid over the newly enclosed space. Slabs were set vertically against the interior wall bases. There apparently was a door into this room on the west side, and a scarlet macaw had been buried in a small cavity dug from the door into the wall base. This breeding-age macaw, buried without its left wing, left leg, and tail fan, was accompanied by macaw eggshell (although the sex of the bird could not be determined). It is interesting that all known Classic Mimbres macaws, including the one from Old Town, have been found in the northern portions of sites, and all were evidently buried without their left wings (Creel and McKusick n.d.; Hargrave 1970:48–49).

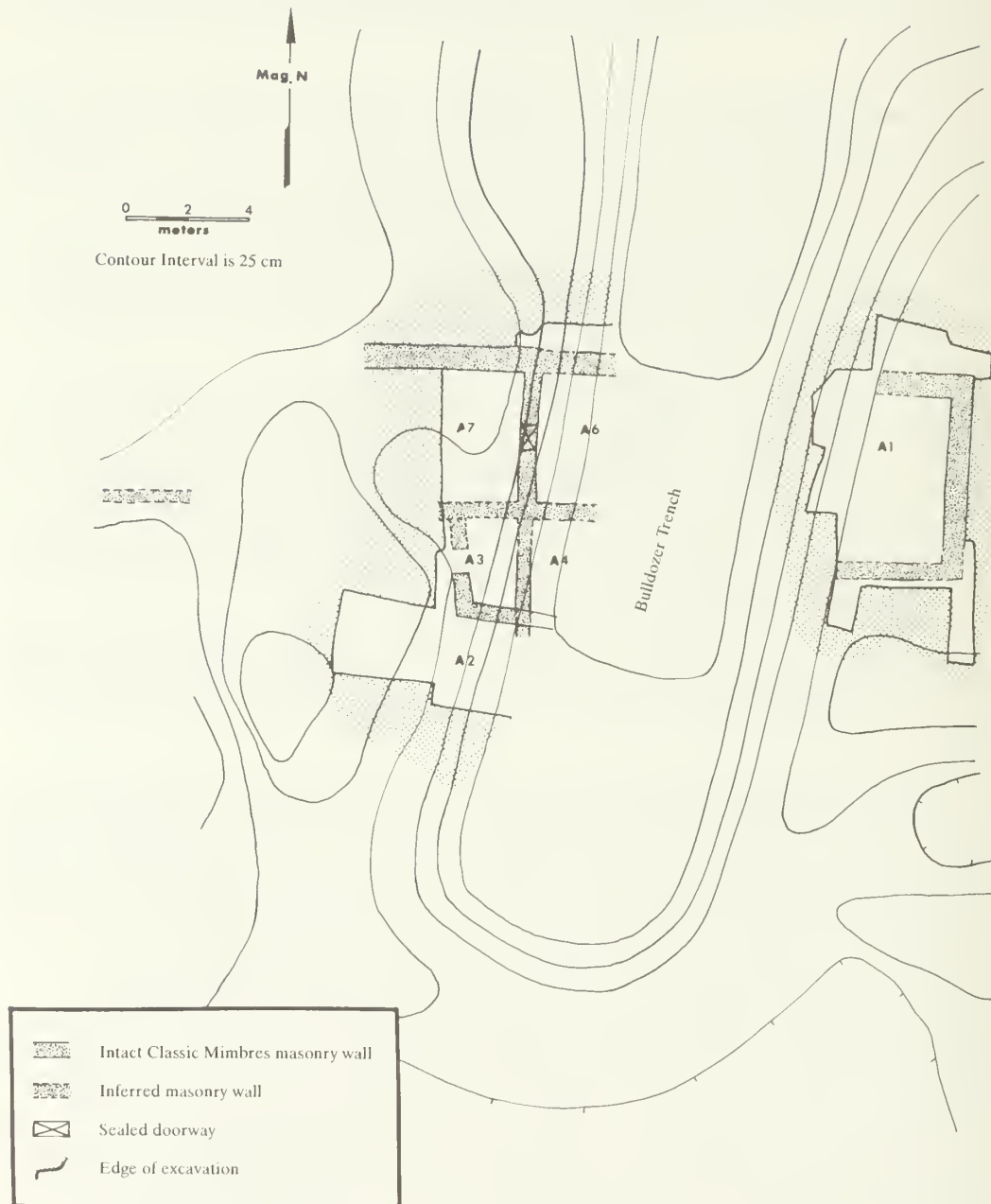


Figure 2.2. Plan of the Classic Mimbres architectural remains found in the Unit 1 excavations in Area A.

Additional work in Area A included testing of Unit 2, a 1 by 2 m excavation dug by hand near the center of a large, distinct depression on the east side of Area A (Figure 2.1). There is little evidence of pothunter disturbance in or adjacent to this depression, and it was thought to mark the location of a large pitstructure.

The test unit encountered bedrock within 20 cm of ground surface, and Backhoe Trench 2, excavated north from the north end of Unit 2 for an additional 8 m, revealed essentially the same situation. The rim of the depression contains quantities of thermally fractured rock, perhaps suggesting that outdoor cooking activities may have taken place with some frequency in this general area. Given the intact nature of the deposits in this portion of the site, further excavation in this apparently extramural area might reveal significant information on outdoor activities at Old Town.

Investigations in Area B

In Area B are four low but distinct rises or mounds that were first suspected to be the remnants of roomblocks (Figure 2.3). The general scarcity of building stone on the surface and the U-shaped arrangement of these rises led us to believe that they represented adobe roomblocks, probably of post-Classic age (Creel 1989:8).

As of 1991, two of these rises have been tested and two masonry-walled pitstructures have been fully excavated, one in each of the rises (Creel 1990, 1991). We did not find the surface architecture that we expected, although a small masonry surface room did partially overlie one of the pitstructures.

One of the pitstructures (Room B2) is a rectangular room whose masonry-walled entryway opened to the north (Figure 2.3); it has a floor area of ca. 11.75 m². Burned wall plaster produced an archaeomagnetic date of A.D. 900–950. This structure clearly burned, but we believe it burned only after the roof had collapsed and after usable wood was removed. This interpretation is based on the virtual lack of wood charcoal and the presence of several centimeters of wash on the floor of the structure.

Floor features include an oval hearth and several postholes. Wall features include a sealed vent in the wall opposite the entryway and a possible vent in the east wall. Two chipped stone hoes were built into the south wall, one on each side of, but lower in the wall than, the sealed vent.

The second masonry-walled pitstructure (Room B4) is slightly larger (17.6 versus 11.7 m²) and is square rather than rectangular (Figure 2.4). It had been remodeled on several occasions, but the major remodeling involved shifting the entryway from the south to the east side and the erection of a new series of roof supports. An intense fire destroyed Room B4. The burned wall plaster yielded an archaeomagnetic date of A.D. 850–940, indicating that Room B4 was roughly contemporaneous with nearby Room B2.

Evidently soon after the collapse of the burned roof, a small masonry structure (Room B6) was built, partially overlying the southwest corner of the pitstructure (Figure 2.4). The fact that Room B6 was built directly on the rooffall of Room B4, the archaeomagnetic date, and the kinds of pottery on the floor of Room B4 all suggest that this poorly preserved surface room dates to the Late Pithouse period, perhaps ca. A.D. 900.

Investigations in Area D

Area D is the area at the base of the cliff that forms the Mimbres Valley margin (Figure 2.1). This area had not been investigated prior to 1989, but we thought it likely that there might be trash deposits along the base of the cliff. Excavation of a short backhoe trench (Trench 3) and a hand-dug 1 by 2 m test unit confirmed the presence of a midden (Creel 1989:9–10).

Excavations in both the trench and the test unit were extended to a depth of nearly two meters below ground surface, where they were terminated at the same stratigraphic level because the sedi-

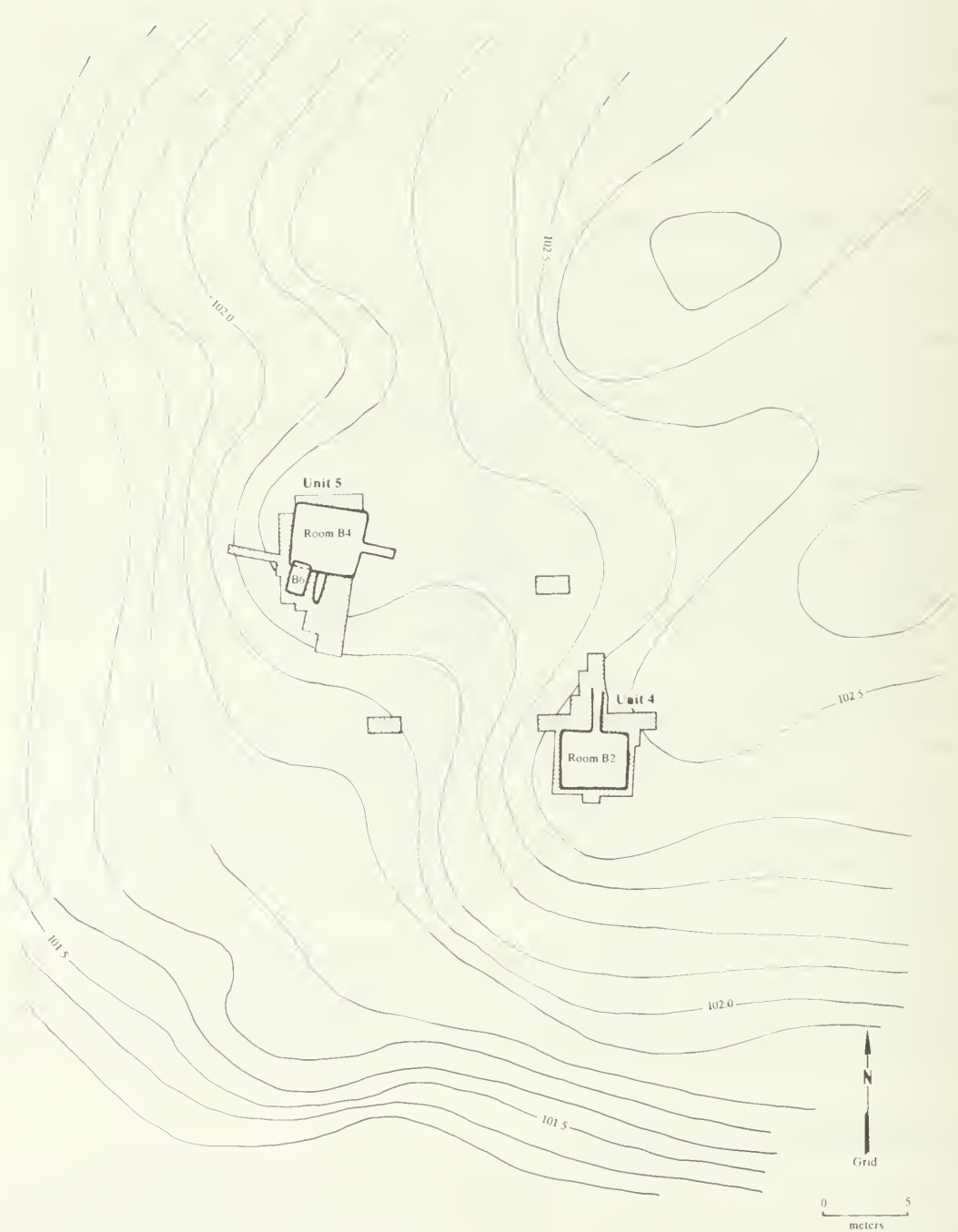


Figure 2.3. Contour map of Area B showing location of 1989–1991 excavations and principal features.



Figure 2.4. Plan of Unit 5 excavations in Area B.

ments were extremely wet and difficult both to dig and to screen. Excavation of the trench and the test unit revealed the presence of a stratified midden deposit. Cultural material was still being recovered in small quantities in the deepest levels, so we do not yet know how deep cultural remains might occur. The ceramics from the deepest sediments thus far sampled appear to date to the early part of the Late Pithouse period, and Early Pithouse material may occur at greater depths.

The fact that cultural debris occurs in relatively deep, stratified deposits indicates considerable potential for intact buried features in this portion of the site. With this potential in mind, during the 1990 season we dug three short backhoe trenches in the floodplain in search of buried agricultural and architectural features (Creel 1990:13). No features were found in these particular trenches, but they cannot be taken as a reasonable or adequate sample of the floodplain in Area D.

Archival Research

In conjunction with these field investigations, a substantial effort has been devoted to documenting collections from Old Town (Creel 1992). Thus far, these collections have primarily been in museums rather than private, individually held collections. Numerous artifacts have been documented, including more than 160 pottery vessels, but unfortunately, little information is available on most of these collections. A few do have important contextual data, however, and archival research has also yielded a fair amount of information on specific features at the site as well as on the history of digging at Old Town.

Overview of Results

Three seasons of work have revealed that much information on the occupation of Old Town can be recovered despite the extensive looting that has occurred there; this applies to the site as well as to existing collections of artifacts and documents. In addition, it is quite clear that large portions of the site have escaped the kind of destruction that has occurred in the main pueblo, and these largely undisturbed areas hold information important not only to research at Old Town itself but to Mimbres archaeology in general.

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Chapter 3

The Archaeological Society of New Mexico's Rock Art Recording Field School at Three Rivers Petroglyph Site

Helen K. Crotty

Since 1987 the Rock Art Recording Field School of the Archaeological Society of New Mexico has been documenting the rock art at the Three Rivers Petroglyph Site under a Cooperative Management Agreement with the Bureau of Land Management, Las Cruces District. Volunteers recruited nationally spend one to two weeks at the site photographing, drawing, and mapping the petroglyphs and carefully noting any natural deterioration or vandalism. The Bureau of Land Management provides camping facilities and support services and pays for film and processing of photographic records. On completion in 1992, the project will provide a basis for monitoring future visitor impact and a database for analysis and interpretation of this renowned rock art site.

This paper reviews the history of the Archaeological Society of New Mexico's Rock Art Recording Field School at the Three Rivers Petroglyph Site and briefly describes this important site and its unique rock art. An estimated 16,000 elements, including modern graffiti, will have been recorded and mapped when the field school completes its sixth and final season at Three Rivers in 1992. In compliance with the terms of the Cooperative Management Agreement, records and photographs from each field season have been deposited at the Museum of New Mexico's Laboratory of Anthropology in Santa Fe and the Las Cruces District Office of the BLM. Provision was only recently made for a final report that would summarize the analysis and documentation of some 216 gridded subsites. Funding of the final report by the BLM will enable a qualified person to undertake this task.

The Rock Art Recording Field School

The Rock Art Recording Field School was established by the late Col. James G. Bain in 1972 at the request of Albert H. Schroeder, who was at that time the president of the Archaeological Society of New Mexico (ASNM). Twenty years later, although procedures have been modified, our objectives remain the same: (a) to familiarize participants with some of the techniques of rock art recording; (b) to further the ASNM's Statewide Rock Art Recording Program and to assist landowners or administrators in their efforts to inventory cultural resources by locating and recording rock art; and (c) to provide basic knowledge and experience for persons wishing to be certified as Rock Art Surveyors in the ASNM Certification Program.

Although the major focus was to train New Mexicans to record New Mexico's rock art, participants have always been recruited nationwide through various archaeological society newsletters, the American Rock Art Research Association, and more recently, through the *Archaeological Fieldwork Opportunities Bulletin* of the Archaeological Institute of America.

The field school is held during the last two weeks of June – after school is out but before the monsoon season begins. Registration is limited to about thirty persons per week, and participants may enroll for one or both weeks. This program is entirely volunteer; participants provide their own food, shelter, transportation, cameras, and compasses. They are organized into four- or five-person crews led by an experienced chief who is responsible for the proper documentation of the team's assigned area. The volunteers are asked to spend a minimum of four hours per day in the field and another hour or so at paperwork. Afternoons are normally left free, but participants attend another one to two hours of training lectures or workshops in the evenings.

The Rock Art Field School at Three Rivers

In 1986 Mike Mallouf, an archaeologist with the BLM Las Cruces District office, contacted Colonel Bain about the possibility of conducting a field school on lands administered by the BLM. Several sites were considered, but only one met all of Colonel Bain's criteria for a field school (Bain 1987). He was particularly interested in the Jornada Mogollon-style petroglyphs at Three Rivers, and he knew that the site – despite its status on New Mexico's State Register of Cultural Properties and nomination to the National Register – had never been completely surveyed and recorded. The BLM, for its part, wanted the field school to locate, record, and map the prehistoric rock art; to document existing vandalism and graffiti as a baseline against which continuing visitor impact could be measured; and to suggest a management plan for the future protection and development of the site.

The 1987 Cooperative Management Agreement with the Las Cruces District BLM was budgeted at \$1000, apparently for administrative expenses to provide camping facilities, trash disposal, and water. Until that year the field school had been self-supporting, but the quantity of rock art at Three Rivers necessitated many more photographs than had previously been needed at other field school sites. The cost of film and processing, together with other expenses, exceeded the income from registration fees. Rather than raise fees, ASNM decided to ask the BLM to fund the photography in future agreements.

The 1988 agreement was negotiated by Jay Crotty, who had assumed responsibility for the field school after Colonel Bain's death in November 1987, and Joseph Martin, the newly appointed White Sands (later Caballo) Resource Area Archeologist, who has continued as our BLM liaison ever since. The agreement, budgeted at \$1500, provided the cost of film and photography in addition to camping facilities and services and also the use of a travel trailer, a generator, and miscellaneous supplies. Budgeting continued at \$1500 in 1989 and 1990, barely covering the cost of the photography. In 1991, the funding level was raised to \$4950, with the BLM paying for the rental and servicing of supplementary portable sanitary facilities. The 1992 agreement for \$6250 will provide some financial support for the writing of the final report as well as the usual field school costs.

In return, the field school has funded the recruiting and training of the participants and supervised an estimated 9000 person-hours of fieldwork. These volunteer hours do not include the time spent after the close of the field season preparing the photographs and documentation from the various crews to be submitted to the Laboratory of Anthropology and the BLM, nor does it include the time spent preparing mailings and training information. These tasks involve at least 200 hours per year, or 1000 hours over the five-year period. In addition, field school staff members submitted lengthy comments on the 1992 Draft Cultural Resource Management Plan for the Three Rivers Historic District (Hanley 1992). To date, we estimate that a minimum of 10,000 person-hours has been contributed by the field school staff and participants at a budgeted cost to the BLM of \$10,450.

The Three Rivers Site

The Three Rivers Petroglyph Site (LA 4923) can be reached by taking a well-marked, paved county road east about five miles from the historic townsite of Three Rivers on US 54, roughly thirty miles south of Carrizozo and thirty miles north of Alamogordo (Figure 3.1). Picnic facilities include restrooms, potable water, and six shelters with tables, barbecue grills, and garbage cans. Cottonwoods, desert willows, and Russian olives shade the picnic shelters and parking. A shelter with an interpretive sign and brochures marks the entrance to the petroglyph trail. At the opposite end of the picnic area a trail leads to a partially excavated Mogollon pithouse village marked with interpretive signs. The area is heavily used by the public, both for picnics and as a convenient overnight rest stop. At the times when the field school volunteers have camped in the picnic area, we have noticed that most of the daytime visitors take the trail at least part way through the petroglyphs.

The site's environmental setting is the Three Rivers drainage, the northernmost of four major drainages flowing from the Sacramento Mountains into the Tularosa Basin. Sierra Blanca, at 12,000 ft the highest of the Sacramentos, is approximately thirteen miles to the east, and the Godfrey Hills lie to the northeast (Hanley 1992). The San Andres Mountains frame the basin twenty-five miles or so to the west. To the northwest lies the malpais lava flow, including Valley of Fires Recreation Area, and to the west and southwest are the White Sands Missile Range and National Monument. The Three Rivers picnic area is situated at an elevation of 5000 ft, and the petroglyph-bearing ridge is some 250 ft higher. Natural vegetation in the area includes grasses, cacti, mesquite, creosote, yucca, and fourwing saltbush, while cottonwoods and other riparian plants are found along the Three Rivers streambed (Hanley 1992). Although cattle have been grazed in the area since the late 1800s, settlement is sparse, and much of the surrounding land appears relatively pristine.

The petroglyphs are concentrated on an isolated "volcanic ridge," more correctly described as a hornblende-biotite lamprophyre sill intrusive into sandstones of the Mesa Verde group (Weber 1964). The ridge is slightly more than one mile long and up to one-third of a mile wide and extends northwest from the picnic area. Most of the petroglyphs are rendered in the Jornada [Mogollon] Style as identified (Schaafsma 1972, 1980) and subsequently dated (Schaafsma 1980) to A.D. 1050–1400 by Polly Schaafsma. Archaic and Apache-style petroglyphs may also be present but are rare. Very little superpositioning has been noted. Lithic scatters, possibly Archaic, occur on the site. Ceramics are absent in the immediate vicinity of the petroglyphs although they occur on two nearby habitation sites, LA 4921 and LA 13510 (Wimberly and Rogers 1977:151–172, 225–236).

Recording Procedures

Major objectives of the field school at Three Rivers, as mentioned above, were to locate, record, and map all the prehistoric rock art as well as all evidence of historical or recent vandalism or graffiti. A major challenge was to devise a system of mapping the location of boulders and outcrops on which the rock art is located. With BLM approval, a permanent traverse was marked along the top of the main ridge and along the top of the lower slope of the central portion of the ridge's east side (Figure 3.2). Each angle point is marked on the ground by a lettered iron spike, and iron spikes set at 10 or 20 m intervals mark the datum points for subsites. Ten-meter intervals were used for the first two years; later it was determined that the use of 20 m intervals would be more efficient.

Subsites are laid out on the ground by stretching binder twine from the designated spikes at right angles to the traverse and then either east or west to another spike set along the boundary fence. Thus spike 10, for example, serves as the datum point at both the southeast corner of subsite 10W as well as the southwest corner of subsite 10E. Angle points in the traverses, steepness of

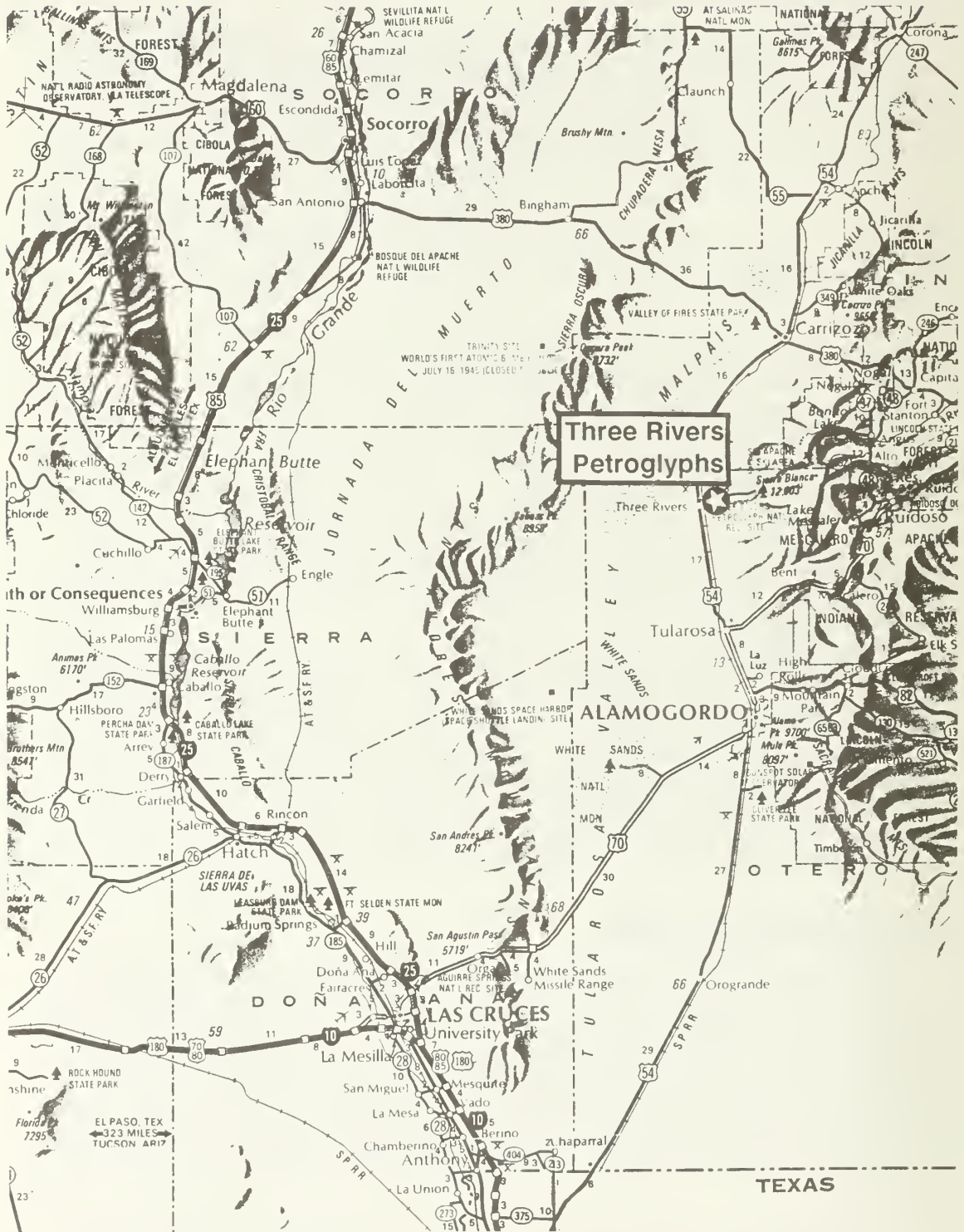


Figure 3.1. Map of New Mexico showing location of Three Rivers Petroglyph Site.

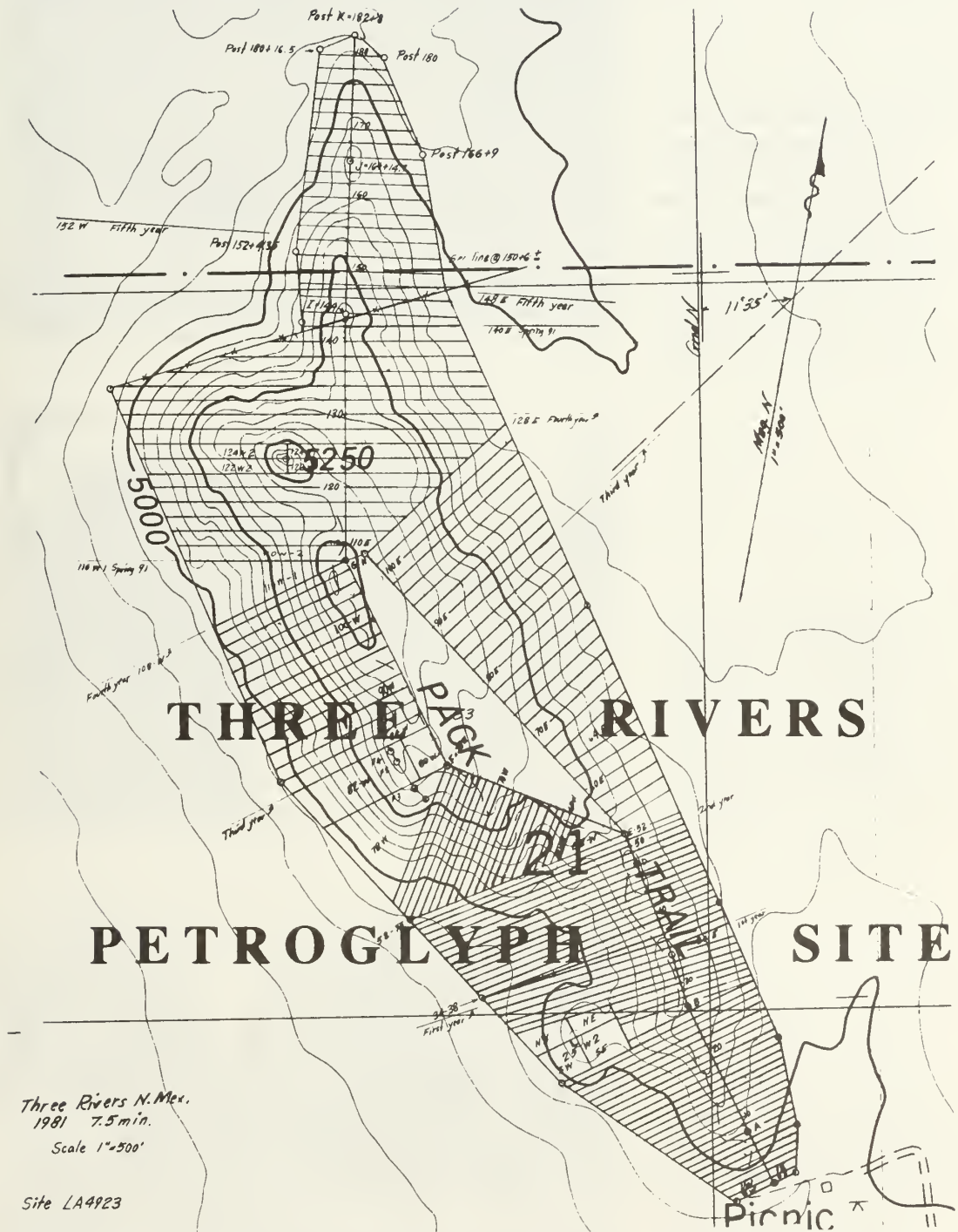


Figure 3.2. Preliminary map of Three Rivers Petroglyph subsites superimposed on enlargement of USGS Quadrangle of the area.

the terrain, or density of petroglyphs necessitated the creation of some irregularly shaped subsites. For example, subsite 53, the triangular plot between traverses near the center of the map, is quite large but actually contains very few boulder-size rocks and therefore not much rock art. The four rectangular plots of subsite 25 W2, just west of the first traverse angle in the southern portion of the site, were dictated by topographical features as well as rock art density. A separate datum point was placed at the center of a small knoll southwest of the main ridge where postpile-like basaltic intrusions contain multiple surfaces suitable for petroglyphs. Some 175 elements were recorded in a single 10 by 10 m area at the northeast corner of the southwest quadrant of this knoll.

Each year's progress is also marked on the map. The 10 m intervals of the first two years are easily seen. The angled line at the top marks the limit of the 1991 season. Virtually all of the subsites that remain to be recorded in the 1992 season are in the northernmost tip of the ridge on state-owned land (Section 16), which is presently leased to the BLM.

After marking the boundaries of a subsite, the recording crew systematically surveys the area, setting a pin flag at each boulder that appears to bear petroglyphs or any other human-caused markings (Figure 3.3). Whether markings are natural or human-made may be a matter of consultation for the entire crew. Doubtful marks are recorded with appropriate notation, and as might be expected, the "random pecking or scratches" category is usually the most numerous.

The first photo for each subsite is an overview taken near the datum and looking out toward a recognizable landscape feature, if possible. Then the crew chief, in consultation with mappers, decides the order in which the petroglyphs will be recorded. Usually the crew members start with the datum point and work in zigzags across the short axis of the subsite, trying to keep natural groupings together if the terrain allows. Petroglyph-bearing boulders (the loci) are given a letter identification, and the compass direction of the decorated rock art face is noted. If more than one surface is decorated, the faces are numbered and direction of each is noted. Each photo includes a scaled 30 cm "mugboard" with crew number, field site number, and photo number (Figure 3.4). Very large panels may require separate detailed photographs as well as an overall photo. The crew recorder keeps a photo data sheet, which records the photo number, compass direction of the rock face, a verbal description of the elements, notes on natural or human-caused deterioration, measurements of the entire rock face, distance from ground level, and a sketch of the elements included in the photograph. The mappers record the distance east (or west) and north of the datum point to the center of the boulder and make a schematic map of the subsite showing the location of the trail, the fence, and all lettered boulders. These maps have been used in subsequent years to re-locate rock art for additional photographs.

Large umbrellas are used to shade both crew members and petroglyphs during recording (Figure 3.5). Bright overhead sunlight often renders the petroglyphs invisible. Since the pecking is extremely shallow, a raking light is of no help, and polarizing lenses are not effective in the early morning hours when most of the fieldwork is done. Fortunately, the Three Rivers petroglyphs usually photograph very clearly with black-and-white film, and it has not been necessary to make color slides or elaborate drawings, as might be required at other sites. Since 1989, a sketch drawing of the petroglyphs or graffiti has been included in the photo data sheet for each picture.

Beginning in 1988, elements have been tallied by categories on a design element sheet designed especially for the Three Rivers site (Table 3.1). The totals are then entered in order of frequency under "Inventory of Elements" on the Laboratory of Anthropology Rock Art Supplement Sheet that is completed for each subsite (Table 3.2). Other entries include the degree of repatination, superpositioning of elements, natural deterioration or vandalism, and anything else the crew finds noteworthy about a particular subsite.



Figure 3.3. Pin flags marking boulders to be recorded. Binder twine delineates boundaries of subsites. In the background, a crew records rock art in adjacent subsite to the south. Photo by Jay Crotty.

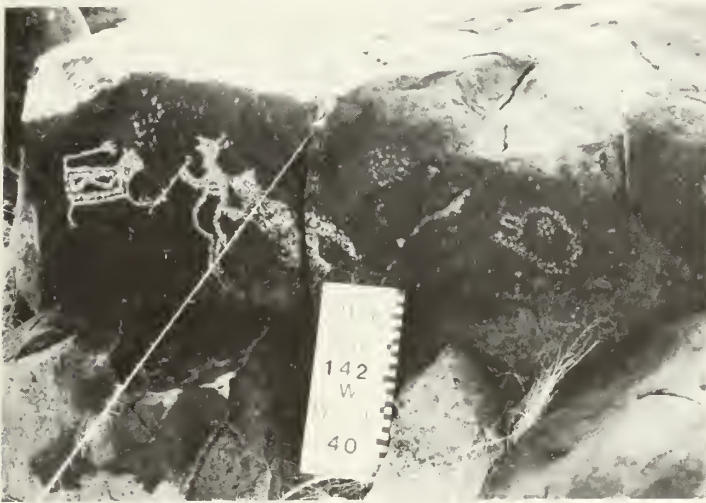


Figure 3.4. "Mugboard" used in recording, with 5 cm marks along right side. Petroglyph in photo falls into the most common category, random pecking or scratches. Photo by Anna King.



Figure 3.5. The Padberg family. Dick Padberg shades petroglyph while Jane draws, and sons Jesse and Chris measure and map location of boulder. Photo by Jay Crotty.

Table 3.1. Three Rivers Design Element Tally Sheet

Crew No. _____	LA/Field No. _____
SINGLE OR PARALLEL LINES	
Straight:	vertical horizontal parallel group
Curved:	arc wavy parallel group curvilinear meander
Angled:	zigzag chevron parallel group rectilinear mcander
Spiral or scroll:	circular rectangular mixed
Mixed straight and curved	
Other (describe)	
Total _____	
INTERSECTING LINES	
Cross:	X multiple open grid
“Rake”:	w/ straight “tines” with wavy “tines”
“Ladder:”	one “pole” two “poles”
Other (describe)	
Total _____	
CLOSED GEOMETRIC FORMS	
Rectilinear	
Rectangle or square:	single concentric clustered
Triangle:	single clustered “saw”
Diamond:	single clustered chain
Other (describe)	
Circular	
Simple circle:	single joined row “netting” spoked circle bisected circle tailed circle
Concentric circles:	two multiple
Nucleated circle (center dot):	single concentric
Circle with exterior rays:	single concentric
Circle with exterior dots:	nucleated concentric other
Dots or disks:	single patterned multiple, no pattern
Partial disk:	crescent “half-moon” other
Other (describe)	
Total _____	
TRACKS	
human foot	bird
feline	canine
	bear
	deer
	other (describe)
Total _____	
HUMAN AND ANIMAL FORMS	
Humanlike figure:	stick outlined infilled patterned face or mask hand print human leg human arm
Mammal quadruped:	stick outlined infilled patterned
Reptile quadruped:	stick outlined infilled patterned
Animal head:	outlined infilled
animal leg:	outlined infilled
Bird:	stick outlined infilled patterned
Fish:	outlined infilled patterned
Insct:	outlined infilled patterned
Other (describe)	
Total _____	
PLANT FORMS (describe)	
Total _____	
ARTIFACT FORMS (describe)	
Total _____	
MISCELLANEOUS	
Continuous line design	
Pictorial scene (describe)	
Unidentified forms	
Other (describe)	
Total _____	
MODERN GRAFFITI	
Names and dates	
Other (describe)	
Total _____	
RANDOM PECKING, SCRATCHES, OR SCRAPES	
Total _____	
Note: Count each design or element only once.	

Table 3.2. Rock art supplement to Laboratory of Anthropology site form.

Museum of New Mexico, Laboratory of Anthropology				LA/Field No. _____	
ROCK ART SUPPLEMENT					
Rock art location:	Cliff	Boulder(s)	Bedrock	Other	
Type of rock:	Basalt	Sandstone	Tuff	Other	
Worked surface:	Vertical	Horizontal	Sloping	Overhead	
Direction(s) rock art faces:					
Overall dimensions of site:					
Number of panels, dimensions:					
Category:	Petroglyph	Pictograph	Both		
Technique:	Pecked	Incised	Abraded	Painted	
Colors:					
Engraving depth:	Shallow	Medium	Deep		
Height of lowest rock art element above present ground level:					
Execution:	Poor	Good	Excellent		
Figure class:	Representational		Abstract		
Style(s), if known:					
Number of elements:	(1-10)	(11-50)	More than 50		
Inventory of elements (in order of frequency):					
Patination of design:					
Background:	Smoke-blackened		Natural	Patinated	
	Other				
Superimposition (describe):					
Natural deterioration:			Vandalism:		
Threatened by:					
Associated tools or paint traces:					
Photos:	B/W (No.)	Color (No.)	Drawings (No.)		

Discussion

Since no running total has been kept of the entries on the Rock Art Supplement Sheets for the individual subsites, only an intuitive estimate of relative frequency of various types of elements can be provided. As noted above, “random pecking or scratches” are the most common elements, and many may be naturally caused. Perhaps the most common recognizable element is the circle, either simple or elaborated in some way (Figure 3.6). Elaborated circles ringed by a row of exterior dots seem to be a Three Rivers specialty (Figure 3.7). Another Three Rivers exclusive – as far as we know – is a complex geometric design rendered in a continuous line (Figure 3.8). In some cases, life forms may be incorporated in the design (Figure 3.9). Life forms, including human figures, human faces or masks, human foot and hand prints, quadrupeds, birds, animal tracks, fish, reptiles, and insects, are fairly common at Three Rivers, though they never outnumber simpler line and geometric elements. The Three Rivers rock art and its significance are more fully discussed elsewhere (Cosgrove and Cosgrove 1965; Crotty 1990, 1991; Schaafsma 1975, 1980; Schaafsma and Schaafsma 1974; Sutherland 1978; Weber 1964; Yeo n.d.)

Modern graffiti, not unexpectedly, are found all along the main trails, but a surprising amount has been found off the trail at some distance from the parking lot. The subsite with the highest incidence of graffiti, recorded only last year, is well north of the point where most visitors turn back. This graffiti may have been executed before development of the present picnic area and parking lot in the 1960s. El Paso newspapers from the early 1900s apparently reported excursions to the site by train, and we have recorded several graffiti dates from the 1920s and 1930s (Figure 3.10). Perhaps these early visitors used a route from the Three Rivers train depot to the site that brought them closer to the north end of the ridge. Research in the old El Paso newspapers is needed to confirm this suggestion.

Vandalism, the deliberate defacing of rock art or the damaging of a petroglyph in an attempt to remove it from the underlying rock, is fortunately very rare, but at least one instance of an attempted theft occurred around 1985 (Figure 3.11). There are also reports of missing decorated boulders. In view of the difficulty sometimes encountered in re-locating a specific unrecorded petroglyph, perhaps these “thefts” did not actually occur and the boulders are still in place. Our documentation will help to verify or refute these reports in the future.

Conclusions

The Cooperative Management Agreements have made it possible for the Archaeological Society of New Mexico to train volunteers in recording techniques and at the same time document a cultural resource of national – indeed, international – importance. At minimal expense to the BLM, some 10,000 hours have been devoted to recording a very large and important rock art site. The data amassed during the past several years will remain merely archival, however, until it can be synthesized in a final report. Possible research topics for the report include the nature and extent of contacts between the Jornada Mogollon and their relatives in the Mimbres or Casas Grandes areas; the extent of Jornada artistic influence on the Rio Grande Anasazi; and the possible meaning of the site for the Jornada and why they seem to have used the area for the manufacture of rock art so much more extensively than their Archaic predecessors or Apache successors did.

The Rock Art Field School is proud to have played a part in documenting the Three Rivers site and planning for its preservation.



Figure 3.6. Circles of various types, the most common geometric element at Three Rivers. Photo by Jay Crotty.



Figure 3.7. Elaborated circle ringed by exterior dots, a Three Rivers specialty. Photo by Helen Crotty.



Figure 3.8. Complex geometric design rendered in a continuous line, a formal device apparently unique to Three Rivers. Photo by Helen Crotty.

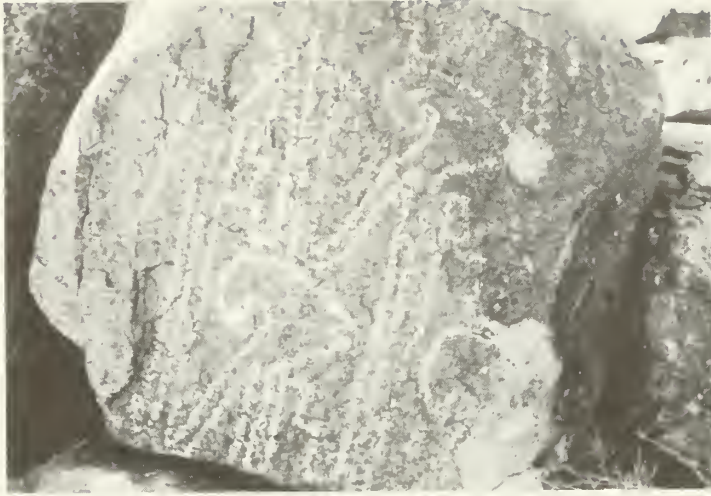


Figure 3.9. A continuous line rendering of a complex geometric design incorporating life forms. Photo by Jay Crotty.



Figure 3.10. Graffiti dated 1925. Photo by Helen Crotty.



Figure 3.11. Animal figure with patterned body apparently damaged around 1985 in an attempt to remove it from the underlying rock. Photo by Helen Crotty.

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Archaeological Research at the Pueblo IV Ruin of Hupobi

Stephen E. Glass and Janice Baker Glass

Under a cooperative agreement with the New Mexico State Office of the Bureau of Land Management (BLM), Wilderness Studies Institute (WSI) conducted three weeks of participant-funded fieldwork and analysis at the large Pueblo IV adobe ruin of Hupobi in north-central New Mexico. Hupobi has been selected as one of the sites to be included in the proposed “Gateway to the Past” Interpretative Loop and along with the immediately surrounding area is felt to have the greatest interpretive potential of the prehistoric Ojo Caliente sites. A program of intensive surface collection, documentation, and monitoring of study plots was initiated in the fall of 1990 to mitigate the possible adverse effects of an increase in unsupervised visitation to the site.

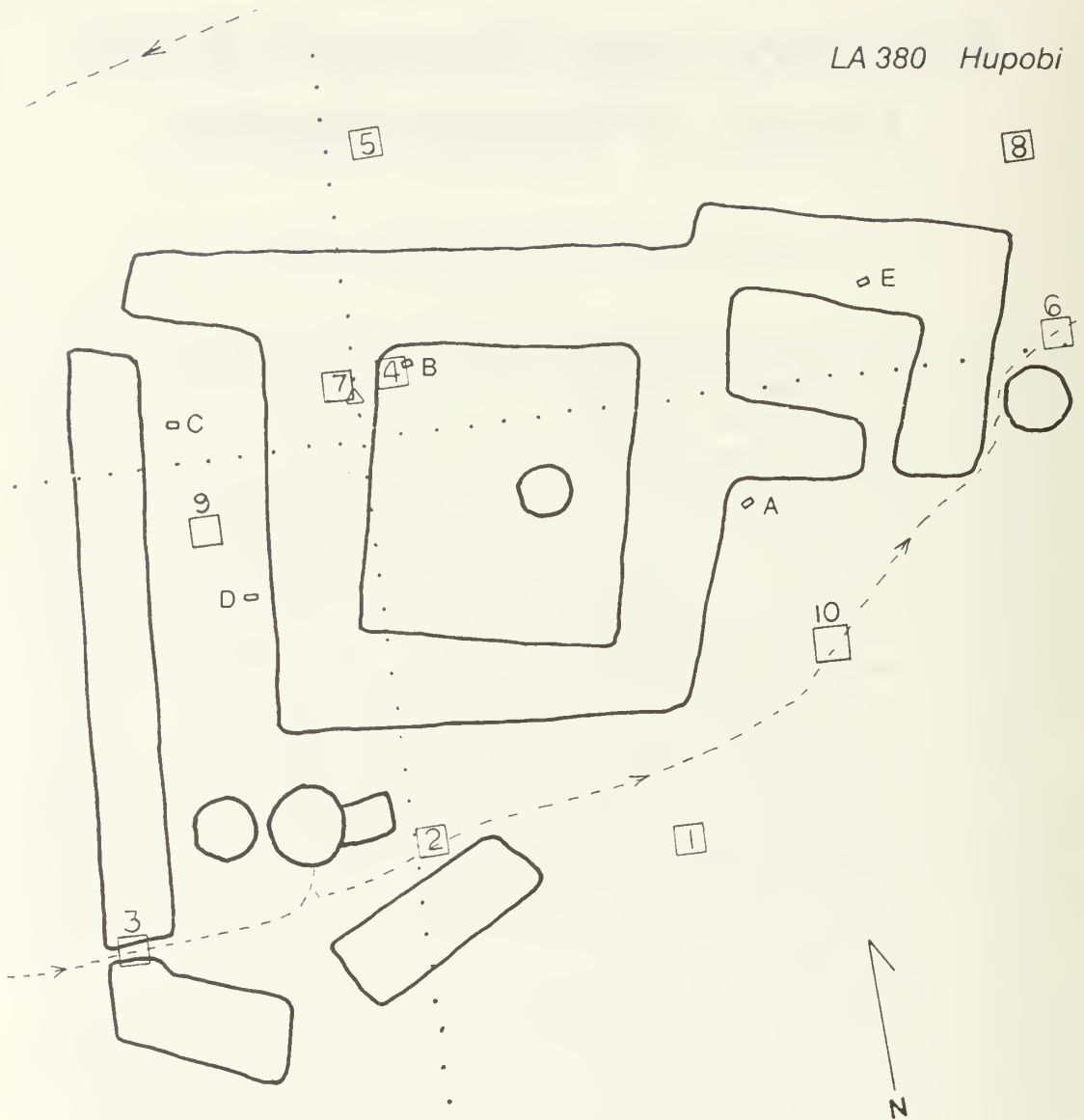
Hupobi (LA 380) is located on an ancient stream terrace overlooking the Rio Ojo, immediately upstream from the Ojo Caliente mineral springs. The site is one of at least seventeen extensive ruins in the Chama region (Hibben 1937:6) dating to the Rio Grande Classic period, A.D. 1326–1600 (Wendorf and Reed 1955). Within the Rio Chama drainage, large pueblo ruins that date to this period are known as “Biscuit Ware” sites because of the abundance of sherds that resemble porcelain in its preliminary or biscuit stage of manufacture (Kidder 1931:73).

Hupobi consists of the mounded ruins of ten adobe roomblocks arranged around three plaza areas (Figure 4.1). The roomblocks are estimated to contain 900 ground-floor rooms, and the variation in mound height suggests that the northern portion of the pueblo may have been two or more stories high. If part of the structure was multistoried, the total number of rooms could have exceeded 1200. The principal building material appears to have been coursed adobe, although quantities of flat stone slabs and large, rounded cobbles are also found on the site. The slabs may have served as roof tiles or hatch covers; cobbles are known to have been used as wall foundations at similar sites (Fallon and Wening 1987:25). Five kiva depressions, including one great kiva, are also found in association with the roomblocks and plazas. Other significant aspects of the site include isolated petroglyph panels located on rock faces between the pueblo and the river (Figure 4.2), grid gardens on the terrace overlooking the site, and a world shrine (15 m in diameter) south of the village area (Jeancon 1923). Ceramic and tree-ring samples previously gathered from Hupobi indicate that the major occupations date from approximately A.D. 1350 to 1550 (Gauthier 1981:7).

The first reference to Hupobi in the archaeological literature is in Bandelier’s report on his investigations in the Southwest during the years 1880 to 1885. In the Ojo Caliente Valley he observed “three of the largest pueblos of New Mexico, Colorado and Arizona . . . within a mile and a half of each other” (1892:37); he was referring to Hupobi, Howiri (LA 71), and Posi (LA 632). Hewett (1906:39) described and mapped one of these sites, referring to it as “Homayo.” Harrington, in his voluminous work on Tewa ethnogeography (1916:161), suggested that Hewett’s identification of the site was mistaken. Harrington’s San Juan Pueblo informants refer to the site as an ancestral Tewan site named *Hupobi’owwikeji*, “pueblo ruin of the flower of the one-seeded juniper” (*Juniperus monosperma*).

In the 1930s Hupobi was recorded by Greenlee in conjunction with his work at Tsama (Greenlee 1933) and was mapped by Mera (1934) for the Laboratory of Anthropology. Stallings

LA 380 Hupobi



KEY

- △ DATUM
- · · · · BASELINE/EAST-WEST LINE
- - - - - ROUTE OF PROPOSED TRAIL
- 1 X 2 METER TEST UNITS (Creamer and Haas 1988)
- 5 X 5 METER STUDY PLOTS, 1990

Figure 4.1. Site map, Hupobi (LA 380).

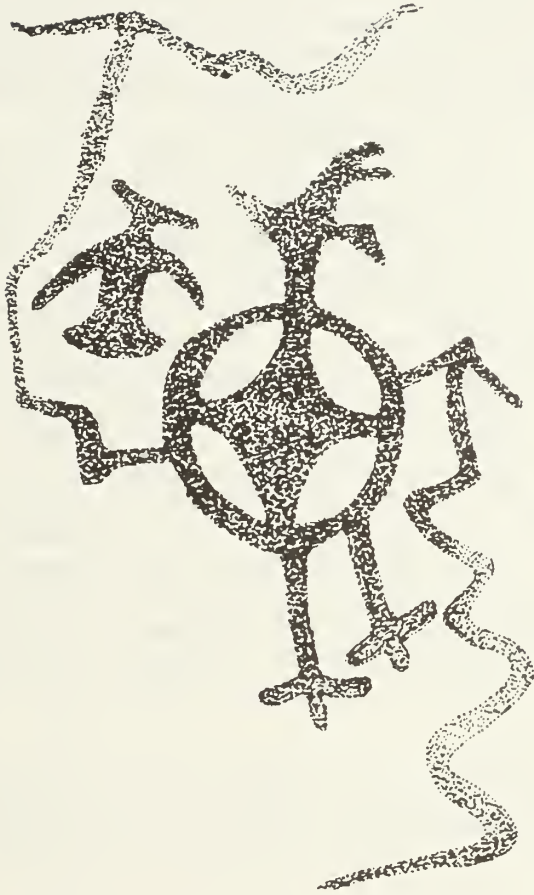


Figure 4.2. Hupobi petroglyph.

raw material recognition, and ceramic classification before actually beginning fieldwork. Identification of rare and unusual trade wares and materials was stressed because their recognition was an integral component of the research design.

The success of this collaboration between public and private institutions is demonstrated by the quantity and quality of data gathered during the two field seasons. This outcome is attributed in large part to the extraordinary level of cooperation and openness to innovative cultural resource management displayed by Bureau of Land Management archaeologists Stephen Fosberg, John Roney, and Paul Williams. Sixty-four volunteers participated in 26 days of fieldwork and analysis, representing more than 3400 volunteer hours.

Methods

The primary objective of this research project was to gather a broad spectrum of cultural resource information sufficient to enable development of Hupobi as a site that would attract visitors to, and educate them about, the cultural resources in the Chama region. A second objective was to implement an effective management tool for measuring the impact of visitors on the site. These objectives were accomplished through the mapping and 100% surface survey of

(1937) collected tree-ring samples from Hupobi, and recently Creamer and Haas (1988) performed limited testing at the site, the only systematic archaeological work at Hupobi prior to the present project.

WSI is a nonprofit research organization that was formed to assist public land agencies in the documentation and preservation of their cultural resources through participant-funded research. At the request of the BLM, WSI began work at Hupobi in September 1990.

Participants of previous WSI programs volunteered to work at the site, and members of the Taos Archaeological Society made generous contributions of time and labor on a daily basis. During three weeks of fieldwork and analysis, volunteers worked under the direct supervision of WSI staff and visiting specialists. Participants received technical orientation and on-site training in basic survey, mapping, artifact and

Hupobi, including collection and analysis of artifacts from 7.5% of the surface area of the site, and the strategic designation of permanent study plots. An intensive artifact collection strategy, based on stratified random sampling, was used to estimate relative proportions of artifacts occurring across the site. Point proveniencing of diagnostic artifacts ensured the documentation of special activity areas and varying periods of occupation in different parts of the site.

Following establishment of site boundaries and a permanent datum, a north-south line was laid out from the datum, extending 225 m across the entire site (Figure 4.1). A 275 m east-west line was then established, intersecting the north-south line 25 m south of the datum. From these arbitrary lines, quadrants were designated based on the cardinal directions. On-the-ground measurements were compared with 1:600 scale, low-level aerial photographs of the site, and the site area was calculated in square meters and plotted on the photos and maps. To ensure uniform sampling across the site, each quadrant was divided into blocks of fifty 5 by 5 m units, each unit of each block was numbered sequentially, and a random numbers table was used to choose a total of 150 collection units, representing 7.5% of the area of each quadrant (Figure 4.3). Each collection unit was photographed, and all surface artifacts were collected and taken to the field lab for analysis.

The Hupobi project was primarily concerned with two archaeological activities: initial documentation, including sampling of the surface assemblage, and estimation of the impact of visitation, collection, and other activities on the site. The archaeological evidence was also placed in a chronological framework that is consistent with other research in the region. We adopted the overall chronology and ceramics identification of the Chama region used by Fallon and Wening (1987) at the neighboring site of Howiri and based on previous work by Kidder (1915, 1936), Mcra (1932, 1934), and Wendorf (1953). Howiri, which is located 600 m east of Hupobi, is the only major Biscuit Ware site that has been the subject of extensive systematic archaeological excavation and analysis.

Small groups of participants, working under the direct supervision of staff and specialists, analyzed the artifacts from each unit. The simplified ceramics typology used in the field is based solely on surface treatment and design and enabled identification of the bulk of the ceramics collected. Intrusive types, trade wares, ceramics from unexpected time periods, or sherds that displayed characteristics beyond the scope of field classification subsequently received more intensive analysis.

Lithic artifacts were sorted, identified by source material, and counted. Although a more thorough study of debitage attributes would be informative, detailed analysis was beyond the scope of this project.

The monitoring portion of this project is an attempt to quantify visitor impact at the site based on documentation of changes in artifact size, density, or distribution. Ten 5 by 5 m study plots were located in key areas across the site. Four study plots were placed near proposed trails, which are likely to receive the greatest impact from human visitation. Four more plots were chosen near obvious site features, including the great kiva and the highest roomblock segment. For use in comparative artifact analysis, two additional study plots were placed in overgrown areas that are relatively inaccessible to both livestock and humans. The coordinates of the southwest corner of each unit were noted, the unit was photographed, and all artifacts were collected from the surface. Counts were made of ceramics, lithics, ground stone, or bone. Ceramics were assigned to broad ware categories, and the size of the sherds was recorded. All but diagnostic artifacts were then returned to their original location. Later, average sherd size and percentages of the total surface collection represented by different artifact types were calculated for each study plot to establish baseline information as well as to enable identification of trends of impact through long-term monitoring.

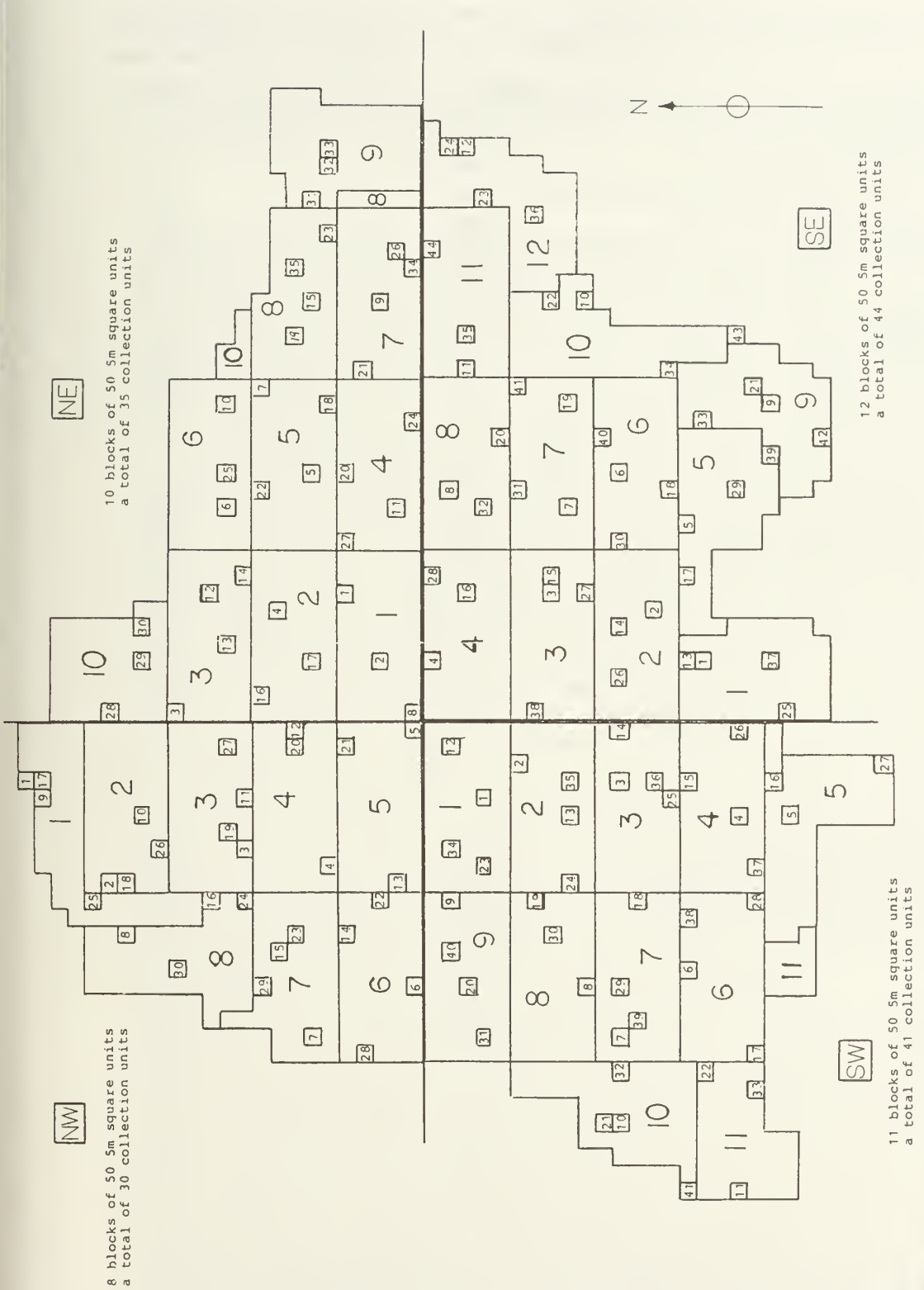


Figure 4.3. Sampling units at Hupobi.

Table 4.1. Comparison of ceramic assemblages, Hupobi and Howiri.

Type	Number	Percent
Hupobi (LA 380)		
Biscuit A (Abiquiu Black-on-gray)	5,198	15.82
Biscuit B bowls (Bandelier Black-on-gray)	10,780	32.85
Biscuit jar (Bandelier Black-on-gray)	1,006	3.06
Unidentified biscuit ware	1,715	5.22
SUBTOTAL	18,712	56.95
Potsuwi'i Incised	369	1.12
Sankawi Black-on-cream	217	0.66
Glazeware	100	0.30
Redware/Orangeware	87	0.27
Polychrome	2	0.00
Sapawe Micaceous-Washboard	3,772	11.48
Micaceous Plain/Other	9,384	28.56
Micaceous Indented/Corrugated	50	0.15
Micaceous Clapboard	55	0.16
SUBTOTAL	13,261	40.48
Other	96	0.29
* Worked sherds	99	0.30
Total	32,844	99.94
Howiri (LA 71)		
Biscuit A (Abiquiu Black-on-gray)	232	0.86
Biscuit B bowls (Bandelier Black-on-gray)	9,696	36.34
Biscuit B jars (Bandelier Black-on-gray)	1,876	7.03
Unidentified biscuit ware	1,826	7.03
SUBTOTAL	13,630	51.08
Potsuwi'i Incised	814	3.05
Sankawi Black-on-cream	125	0.46
Glazeware	191	0.71
Sapawe Micaceous-Washboard	11,574	43.38
Other	34	0.13
Worked sherds	309	1.15
Total	26,677	99.95

* Worked sherds from Hupobi were included in the ware category of the original sherd; worked sherds from Howiri are counted separately.

Results

As stated previously, the archaeological research at Hupobi involved two separate tasks: gathering of baseline data (including mapping and stratified random sampling) and implementation of a system for documenting visitor impact. Both were based entirely on surface indications.

Sampling

Our original research design called for the sampling of 10% of the site and analysis of 2.5% of the surface artifacts. Once in the field, we found that the size of the site and the high density of artifacts would result in the collection of redundant data. After consulting with the BLM cultural resources staff, we decreased the sample size to 7.5%. Although a greater than expected number of sherds was being collected, the ceramic analysis was found to be less time consuming than anticipated and we therefore chose to conduct preliminary analysis of the entire artifact collection in the field. Following the fieldwork, 25% of the ceramic collection was reanalyzed to test the accuracy of the field analysis methods. We also deviated from the ceramic analysis procedure followed at Howiri by expanding the number of types in the utility ware category (Table 4.1).

Totals of 32,844 sherds and 7413 lithic artifacts were recorded. The ceramic evidence from Hupobi indicates a significantly longer occupation of the site than was previously documented. Although Stallings's tree-ring dates of A.D. 1271 to 1367 have been questioned (Fallon and Wening 1987), our analysis appears to support his data. The ceramics suggest that the occupations minimally spanned the period from A.D. 1300 to 1650. Early occupation dates are indicated by the presence of Glaze A redwares and certain polychromes, yellow wares, and black-on-white and utility wares; the later occupation dates are indicated by Tewa Polychrome, Glaze E wares, Hopi yellow ware, Cuyamungue Black-on-tan, and Kapo Black wares (David Kayser, Farmington Resource Area Archaeologist, Bureau of Land Management, personal communication 1990).

Data from the surface collection were used to determine the relative temporal placement of each collection unit and the overall temporal periods represented at Hupobi. Although Hupobi has obviously been affected by natural weathering, livestock grazing, looting, and casual collection of surface artifacts, the percentages of various ware categories in the ceramic assemblage from Hupobi are remarkably consistent with those in the subsurface assemblage from neighboring Howiri. The results of previous research at Biscuit Ware sites of the Rio Grande Classic period led us to anticipate the presence of a small percentage of Biscuit A in the surface assemblage. As indicated in Table 4.1, however, the relatively high percentage of Biscuit A and correspondingly low percentages of Biscuit jars, redware, polychrome, and Potsuwii' Incised are consistent with the type of assemblage expected from an undisturbed record of occupation. Typically the ratio of biscuit ware to decorated sherds would not be expected to remain unchanged after years of casual collecting (Lightfoot and Francis 1978). Since the contemporaneity of the two sites has not been questioned, we are left to consider why there might be differences in the integrity of the surface assemblages. We feel that the integrity of the surface ceramic assemblage, which in this case is considered to be representative of the overall ceramic assemblage at the site, may be the result of the extensive livestock grazing of the site. This suggestion is based on our belief that the attractiveness of sherds to the casual collector is determined as much by size as it is by design or surface treatment. Ceramic assemblages at archaeological sites like Hupobi, which have been subjected to decades of livestock grazing, display an average sherd size of 6.25 cm^2 , or the size of a quarter (Glass and Glass 1989). It appears that sherds of this size, regardless of their decorative style, may no longer be attractive to casual collectors. The natural churning of artifacts, including bioturbation, combined with the indiscriminate reduction in sherd size by livestock hooves, has resulted in a surficial ceramic assemblage that is not only representative of the subsurface assemblage but is also somewhat immune to casual collecting. When the results of testing by Creamer and Haas (1988)

become available, a more accurate comparison of types, sizes, and numbers of surface versus subsurface artifacts should be possible.

Other indications from surficial evidence include disturbance of 30–40% of the roomblocks by vandals; site growth by accretion, with the northeast quadrant containing the oldest portion of the pueblo; and extensive midden areas and a concentration of intrusive ceramics in the southeast quadrant.

Monitoring

The second aspect of the project was an attempt to quantify and document the impact of human visitation at Hupobi. The primary activity of the monitoring program was to establish baseline artifact assemblage characteristics and identify trends of impact. Study plots were selected judgmentally rather than at random, as described above; therefore, although types of artifacts noted in these units may be representative of the entire site's surface assemblage, densities may not be. We assume that large decorated potsherds would be most attractive to casual collectors (Lightfoot and Francis 1978). We therefore anticipated that the largest average sherd size would be found in the more remote portions of the site, and that a correlation would be found between sherd size and the percentage of glazeware or polychrome sherds remaining on the site.

A total of 1150 sherds were typed and sized during the on-site analysis and returned to their original location. Average size was calculated for each of the ware categories. As mentioned earlier, no correlations were found between areas of the site and particular ware categories; however, the more inaccessible areas did display larger average sherd sizes. At this point it is difficult to say whether this finding reflects a lack of human visitation, inaccessibility to livestock, or both.

We also assume that flaked stone artifacts are not collected randomly and that certain types and materials would be preferred by amateur collectors. Of a total of 648 lithics counted in our study plots, only one biface fragment and no diagnostic artifacts were recorded, which seems to support this assumption.

Conclusion

Analyses of the surface-collected artifacts and comparison with the subsurface assemblage from nearby Howiri suggest that despite years of uncontrolled surface collecting, proportions of surface ceramics at Hupobi still closely mirror the presumed subsurface distributions. These results underscore the importance of determining the integrity and representativeness of surface artifact assemblages before attempting general site interpretation. It appears that livestock grazing at Hupobi may have inadvertently provided protection from the collection of diagnostic sherds. Unfortunately, accompanying this effect is a reduction in sherd size. Protection of the remaining surface artifacts could now be improved through removal of livestock from the site. Elimination of grazing and the resultant revegetation of the site would shield remaining artifacts and make casual collecting more difficult.

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Dating the Dinetah Pueblitos: The Tree-Ring Data

Ronald H. Towner

The pueblitos of the Dinetah have played an important role in studies of Navajo history and culture change. Since their initial description by Kidder (1920) early in this century, the pueblitos, in combination with historical documents, have been used to infer an influx of Puebloan refugees that fundamentally changed Navajo culture after the Spanish Reconquest of New Mexico in the late 1600s (Hester 1962; Hill 1940). Indeed, a few researchers (e.g., Brugge 1963; Van Valkenburgh 1974) indicate that several Navajo clans originated with the Puebloan refugees. The purpose of this paper is to examine these inferences using all available tree-ring dates from the pueblito sites.

The Dinetah is the ancestral Navajo homeland located in the Largo and Gobernador drainages of northwestern New Mexico (Figure 5.1). It is the location of several Navajo sacred places and creation stories. Both Navajo oral tradition (Roessell 1983) and historical documents (Bandelier 1890–1892) have been used to suggest that after the Spanish Reconquest of New Mexico and the subsequent attempted revolt of 1696, Dinetah Navajo culture was fundamentally changed by intermarriage and co-residence with Pueblo refugees, particularly groups from Jemez and Santa Clara pueblos (Brugge 1968). This hypothesis has never been adequately tested with archaeological data, but it has been explicit in all recent syntheses of Navajo culture history (Bailey and Bailey 1986; Brugge 1983; Hester 1962; Kelley 1982). The postulated influx of Pueblo refugees is one of the most significant aspects of the Gobernador phase, A.D. 1700–1775 (Dittert 1958), suggested to be a time of intense contact between Puebloan refugees and the Dinetah Navajo (Hester 1962). Pueblitos and ceramics were among the traits used to define the phase, and “a general infusion of Puebloan blood and culture” was thought to have significantly altered Navajo culture (Carlson 1965:105).

Pueblito Sites

More than 100 pueblito sites have been documented in the Dinetah; pueblitos have also been recorded in areas to the south and west (Bannister et al. 1966; Keur 1941, 1944; Vivian 1960), but only those in the Dinetah are considered in this analysis. Many of these sites contain masonry pueblitos and forked-stick hogans in relatively defensible positions (Powers and Johnson 1987). The masonry structures range from single rooms on boulders and cliff edges to large, multistory structures containing forty or more rooms and associated features. In addition to the masonry structures, the pueblito site complexes (Marshall 1991) often contain forked-stick hogans, sweat-lodges, extramural hearths, associated rock art panels, evidence of sheep herding, and other cultural manifestations. Not a single kiva has been identified at a pueblito site, with the possible exception of a depression at Tapacito Ruin (LA 2298; Marshall 1991). Ceramic assemblages on the sites generally consist of Dinetah Graywares, Gobernador Polychrome, and a variety of Puebloan glazewares from both the Rio Grande and Zuni-Acoma areas. At the nine sites analyzed by Marshall (1991), Puebloan wares never constitute more than eight percent of the ceramic assemblage. Euroamerican-derived artifacts, such as metal axes and trade beads, and faunal remains of sheep

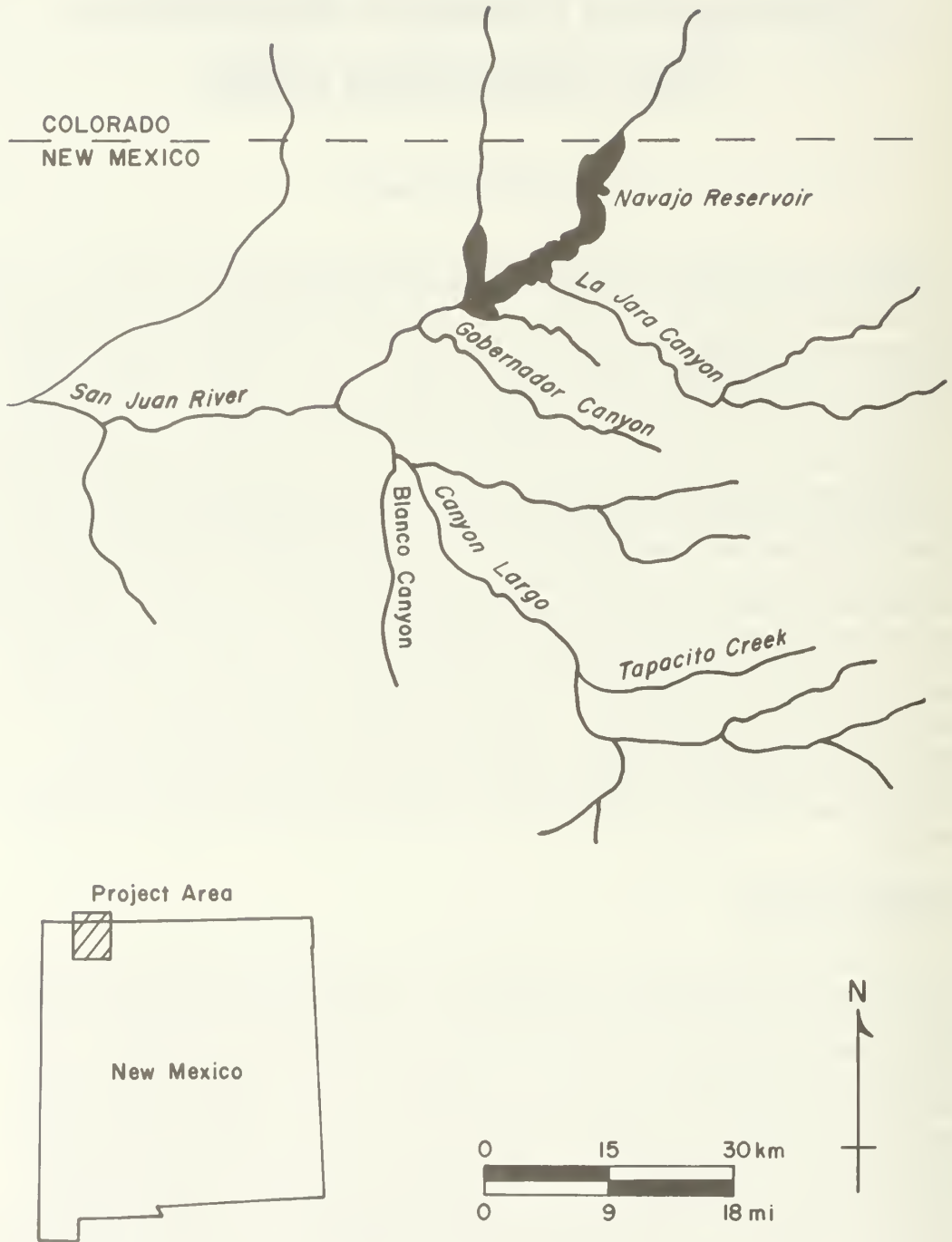


Figure 5.1. Location of the Dinetsah Dating Project.

and horses have been recovered from the sites during limited excavations (Carlson 1965). The artifacts, in addition to axe-cut beams and architectural features such as hooded fireplaces, clearly indicate historical occupation of the sites.

Two explanations have been proposed for the initial immigration of the Puebloans into the area and for the defensive nature of the sites. First, fear of Spanish reprisals after the failed revolt of 1696 has been suggested as a reason for the initial immigration of Puebloan peoples into the area (Hester 1962:89; Kidder 1920:238). The defensive locations of many of the pueblitos were originally interpreted as protective measures against retaliatory raids by the Spanish garrisons (Keur 1944:85–86). An alternative view of the defensive nature of the sites (Brugge 1972; Carlson 1965; Powers and Johnson 1987) suggests that Ute or Comanche raiding, beginning about 1716, caused the sites' occupants to adopt a more defensive posture. The latter interpretation is based in part on the distribution of tree-ring dates, which indicates that most of the sites were built more than twenty years after the failed revolt of 1696. Despite indications that the sites were built for protection against the Utes and not the Spaniards, construction of the pueblitos is still generally attributed to the hypothesized influx of Pueblo refugees (Brugge 1983; Roessell 1983; cf. Hogan 1991 for an alternative view).

The pueblito sites unquestionably show Navajo, Pueblo, and Spanish influences. There is also no doubt that Navajo culture has been profoundly influenced by contact with these groups. Because of the uncritical acceptance of the refugee influx hypothesis, however, it has been assumed that the immigration of large numbers of refugees was the mechanism responsible for significant changes in Navajo culture. The question that has not been adequately tested with archaeological data is "What were the cultural processes that created Dinetah Navajo culture?" This question is addressed below primarily with dendrochronological data.

Tree-ring dates have played an important role in our perceptions about the Gobernador phase in general and pueblitos in particular. The early tree-ring collections from the Dinetah yielded dates ranging from the late sixteenth until the middle of the eighteenth centuries, dates that fit perfectly with the refugee influx hypothesis. In particular, a cluster of dates between 1690 and 1694 from Tapacito Ruin suggested an initial phase of pueblito construction that coincided exactly with the return of the Spaniards to northern New Mexico. These and other dates are discussed below.

The Tree-Ring Data

Wood samples for tree-ring dating have been collected from pueblito sites by various individuals representing different institutions for more than fifty years (Farmer 1942; Hall 1951; Hall and Stallings 1939; Robinson, Harrill, and Warren 1974; Stokes and Smiley 1963, 1969; Wilson and Warren 1974). A total of 618 datable tree-ring samples have been collected from more than sixty sites. The exact number of sites and provenience of many of the samples cannot be determined owing to the nature of the early collections. Most of the samples acquired prior to 1970 were collected from loose logs on the sites, and little concern was shown for exact provenience. The objective of most of the early collectors was simply to get an idea of the time period a particular site was occupied, and a few samples from each single site were considered sufficient to accomplish this goal. Additional chronological and behavioral information was not necessary and was not routinely collected. Samples collected in the 1970s (Haskell 1974; Wilson and Warren 1974) were accompanied by good provenience information, but the sampling was limited to a few sites.

Thus, prior to the start of this project, tree-ring data from the pueblito sites consisted of an array of sixteenth- through eighteenth-century dates collected rather haphazardly from loose logs in and around various structures. Seventeen of the more than one hundred sites had at least one tree-ring date, but most were non-cutting dates from uncertain proveniences – hardly an ideal situation for reconstructing human behavior over such a large area.

The current project began in 1990 and is a cooperative venture between the New Mexico Bureau of Land Management and the Laboratory of Tree-Ring Research at the University of Arizona. Dubbed the Dineta Dating Project, the goals of the project are to reanalyze all published and unpublished tree-ring dates associated with the pueblitos and to sample every piece of datable wood remaining on all the pueblito sites. The data presented below are a result of the analysis of the existing dates and samples collected during the first two field seasons of the project (1990–1991).

Distribution of All Tree-Ring Dates

As mentioned above, the samples collected by various researchers over the years have yielded 618 dates from at least 61 sites (Table 5.1). An analysis of all tree-ring dates collected from pueblito sites suggests a broad temporal range of occupation (Figure 5.2). Simply viewing the dates as numbers and ignoring, for the moment, the impact on these dates produced by various cultural and natural formation processes (Robinson et al. 1974:4–5) indicates a protohistoric to early historical period occupation of the sites. The dates range from A.D. 1544 to 1780, although the bulk of the dates (88%) fall between 1690 and 1754. Two important aspects of the distribution, the high point at 1690–1694 and the general curve between 1710 and 1754, are reflected in other data discussed below.

Sixty-five samples date prior to the 1690–1694 period, but only eight of the samples represent cutting dates. Non-cutting dates cannot be used to date the occupation of the sites, since the outer rings have been removed. The dates from these dendrochronological samples do not reflect human activity at the sites during this time period. Instead they provide only a baseline date, prior to which the tree could not have been used by the site occupants. The use of unclustered non-cutting dates to infer an occupation date for a site or area (Opler 1983:381; Reed and Horn 1990:292; Young 1983:393) is totally inappropriate and only confuses the issue of when that site or area was occupied.

Taken as a body of data, the distribution of all tree-ring dates does not contradict the interpretations of earlier researchers that the pueblitos were occupied from shortly after the Reconquest until the middle of the eighteenth century. They confirm a predominantly historical period occupation of the sites and lend support to the refugee influx hypothesis.

Distribution of Cutting Dates

Cutting dates indicate the last year a tree produced a cambial layer, whether complete or incomplete. As such, these dates are approximations of a “death date” for the tree. When these dates are from timbers in an archaeological context they may be used as a temporal measure of human activity, but any such inference depends upon archaeological, not dendrochronological, data (Dean 1978). The use of death dates without considering their archaeological context is not an appropriate method for inferring occupation of a site or area.

The Dineta samples have yielded 290 cutting dates representing 37 structures on 32 sites (Figure 5.3). The cutting dates range from A.D. 1634 to 1752 and exhibit a distribution similar to that of all dates, although the range is almost 100 years shorter. The vast majority of the cutting dates (97%) postdate 1690, indicating that the sites were probably not occupied prior to the late 1600s. Explaining the highs and lows present in the cutting date distribution can contribute to our understanding of the complexity of the pueblito phenomenon and suggest avenues for future research. The peak in the distribution at A.D. 1690–1694 suggests an initial building surge immediately after the De Vargas campaign of 1694. All but two of the cutting dates that constitute this peak, however, come from a single site, Tapacito Ruin (LA 2298). Tree-ring samples from this site have been collected by three different research teams (Hall and Stallings 1939; Towner and Dean 1992; Wilson and Warren 1974), making Tapacito Ruin one of the most intensively sampled structures in

Table 5.1. Pueblo site tree-ring data.

Site Name	Site Number	Hogan or Pueblo	Earliest Cutting Date	Latest Date	Number of Clusters	Cutting Date Clusters	Number of Dates	Source
Adams Canyon	LA 55824	Pueblo		1736 + VV	0		4	Towner 1992
Boulder Fortress	LA 55825	Pueblo	1723G	1728V	1	1727	8	Towner 1991
		Hogan		1709 + VV	0		1	Towner 1991
Tapacito Ruin	LA 2298	Hogan(?)	1690r	1690R	1	1690	9	Towner and Dean 1992
		Pueblo	1694B	1694B	1	1694	23	Towner and Dean 1992
Frances Canyon	LA 2135	Pueblo	1710B	1745c	6	1710, 1714, 1715, 1722, 1736, 1743	49	Towner 1991
		Hogan		1566 + w	0		3	Towner 1991
Hooded Fireplace	LA 5662	Pueblo	1723B	1723B	1	1723	9	Towner 1991
The Citadel	LA 55828	Pueblo		1688 + + B	0		5	Towner 1992
Simon Canyon	LA 5047	Pueblo	1691G	1754 + G	1	1754	4	Towner 1991
Largo School	LA 5657	Pueblo	1736c	1737G	1	1736	6	Towner 1991
Hadlock's Crow Canyon	LA 55830	Pueblo		1661w	0		3	Towner 1991
Crow Canyon	LA 20219	Pueblo		1723w	0		7	Towner 1991
Jarmillo Canyon		Pueblo		1731 + G	1	1730	3	Towner 1992
Split Rock	LA 5664	Pueblo		1727w	0		4	Towner 1991
		Hogan		1665w	0		2	Towner 1991
Shaft House	LA 5660	Pueblo		1712 + LB	0		4	Towner 1992
Truby's Tower	LA 2434	Pueblo	1725inc	1752inc	1	1743	9	Stokes and Smiley 1969
Kin Yazhi	LA 2433	Pueblo	172inc	1743c	1	1732	12	Stokes and Smiley 1969
Cottonwood Divide	LA 55829	Hogans		1715w	0		7	Towner 1992
Pork Chop Pass	LA 5661	Pueblo	1725inc	1747inc	2	1742, 1745	15	Stokes and Smiley 1969
Pointed Butte	LA 10733	Hogan	1683inc	1748 +	1	1721	8	Stokes and Smiley 1969
Canyon View	LA 55827	Pueblo	1701inc	1727c	1	1727	7	Stokes and Smiley 1969
Overlook Site	LA 10732	Pueblo	1725inc	1732c	2	1725, 1727	12	Stokes and Smiley 1969
		Hogan	1682inc	1727c	0		4	Stokes and Smiley 1969
Foothold Ruin	LA 9073	Pueblo	1720c	1737 +	2	1734, 1737	11	Stokes and Smiley 1969
		Hogan	1667inc	1710 +	0		4	Stokes and Smiley 1969

Table 5.1. Pueblito site tree-ring data (continued).

Site Name	Site Number	Hogan or Pueblito	Earliest Cutting Date	Latest Date	Number of Clusters	Cutting Date Clusters	Number of Dates	Source
Three Corn Ruin	LA 1871	Pueblito	1634L	1745G	5	1709, 1714, 1728, 1731, 1732	62	Towner 1992
Unreachable Hogans Cabresto Mesa Old Fort Ruin		Hogan	1707c	1715G	0		3	Robinson, Harrill, and Warren 1974
	LA 55841	Hogans		1941 + GB	0		8	Towner 1992
	LA 2138	Pueblito	1712inc	1714r	1	1714	12	Stokes and Smiley 1963
	LA 1869	Pueblito	1721GB	1753v	5	1743, 1746, 1746, 1749, 1753	59	Towner 1992
Dos Cerritos	LA 2136	Hogans Pueblito (?)	1733r	1747vv 1734r	0 1	1733	6 6	Towner 1992 Robinson, Harrill, and Warren 1974
	LA 2137	Pueblito	1746r	1750r	1	1746	4	Robinson, Harrill, and Warren 1974
Maize House	LA 1872	Pueblito	1727r	1727r	0		1	Robinson, Harrill, and Warren 1974
Horn Ranch Site Pueblito Canyon	LA 1868	Pueblito	1733c	1733c	0		1	Hannah 1965
	LA 1684	Pueblito	1732inc	1735c	1	1732	5	Stokes and Smiley 1963
	LA 4331	Pueblito		1700 + w	0		1	Hester and Shiner 1963
	LA 1687	Pueblito		1744 + w	0		1	Smiley 1951
Munoz Canyon Site 12	LA 2297	Pueblito		1726vv	0		4	Robinson, Harrill, and Warren 1974
Site 25	LA 2305	Hogan	1718r	1722vv	0		3	Robinson, Harrill, and Warren 1974
Compressor Station Gould Pass Ruin	LA 8948	Hogan		1695vv	0		1	Robinson, Harrill, and Warren 1974
	LA 5658	Pueblito	1727G	1728G	1	1727	13	Towner 1992
	LA 5659	Pueblito	1749LGB	1753LGB	2	1749, 1751	17	Towner 1992
		Hogan		1710vv	0		1	Towner 1992
Hill Road Ruin	LA 55833	Pueblito	1733L	1741L	4	1733, 1737, 1738, 1741	21	Towner 1992

Table 5.1. Pueblito site tree-ring data (continued).

Site Name	Site Number	Hogan or Pueblito	Earliest Cutting Date	Latest Date	Number of Clusters	Cutting Date Clusters	Number of Dates	Source
Gomez Canyon Ruin	LA 55831	Pueblito	1733L	1747w	1	1734	23	Towner 1992
		Hogans		1726 + w	0		3	Towner 1992
E-CL-UL-A		Hogan (?)		1544 +	0		1	Stokes and Smiley 1969
E-CL-UL-F		Hogan (?)		1705 +	0		1	Stokes and Smiley 1969
E-CL-UL-K		Pueblito	1725G	1745inc	1	1741	14	Stokes and Smiley 1969
E-CL-UL-M		Hogan	1723inc	1723inc	0		1	Stokes and Smiley 1969
E-CL-UL-U		Pueblito	1689inc	1731inc	1	1711, 1727	16	Stokes and Smiley 1969
E-CL-UL-V		Pueblito		1730 +	0		3	Stokes and Smiley 1969
E-CL-UL-W		Hogan	1701inc	1780 + G	0		12	Stokes and Smiley 1969
E-CL-UL-KK		Hogan	1674inc	1729 +	0		6	Stokes and Smiley 1969
N-USJ-GLJ-B		Hogan		1743 +	0		1	Stokes and Smiley 1963
N-USJ-GLJ-C		Hogan	1701inc	1747inc	0		5	Stokes and Smiley 1963
N-USJ-GLJ-E		Pueblito	1715inc	1731inc	1	1718	4	Stokes and Smiley 1963
Pueblito East	LA 55834	Pueblito	1713inc	1713inc	0		2	Stokes and Smiley 1963
N-USJ-GLJ-EE		Hogan	1734inc	1734inc	0		1	Stokes and Smiley 1963
N-USJ-GLJ-LL		Hogan		1744 + inc	0		2	Stokes and Smiley 1963
N-USJ-GLJ-QQ		Pueblito	1703G	1725c	0		3	Stokes and Smiley 1963
N-SJ-LA-D		Hogan (?)		1771 +	0		1	Stokes and Smiley 1963
N-SJ-LA-E		Hogan (?)		1745 +	0		1	Stokes and Smiley 1963

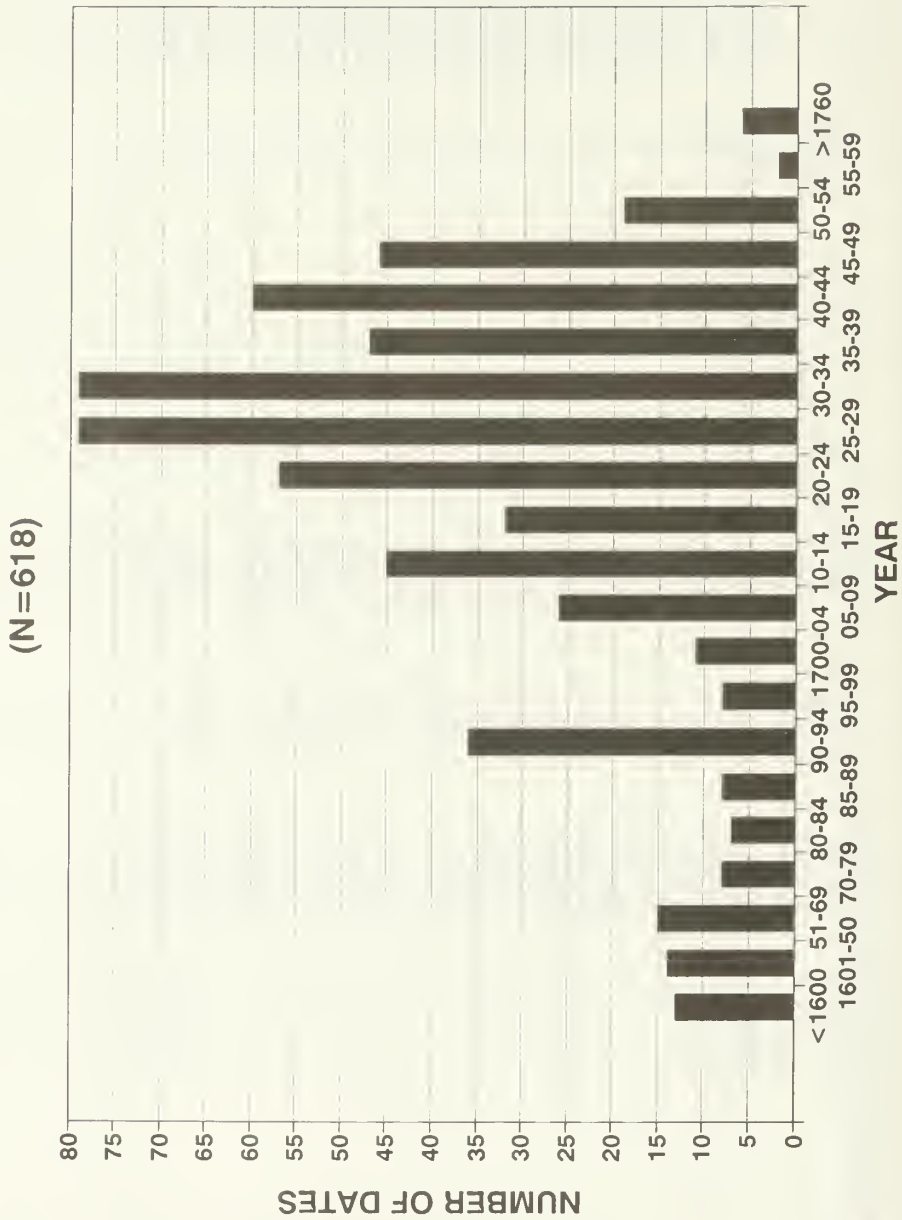


Figure 5.2. Distribution of all tree-ring dates collected by the Dineta Dating Project.

(N = 290)

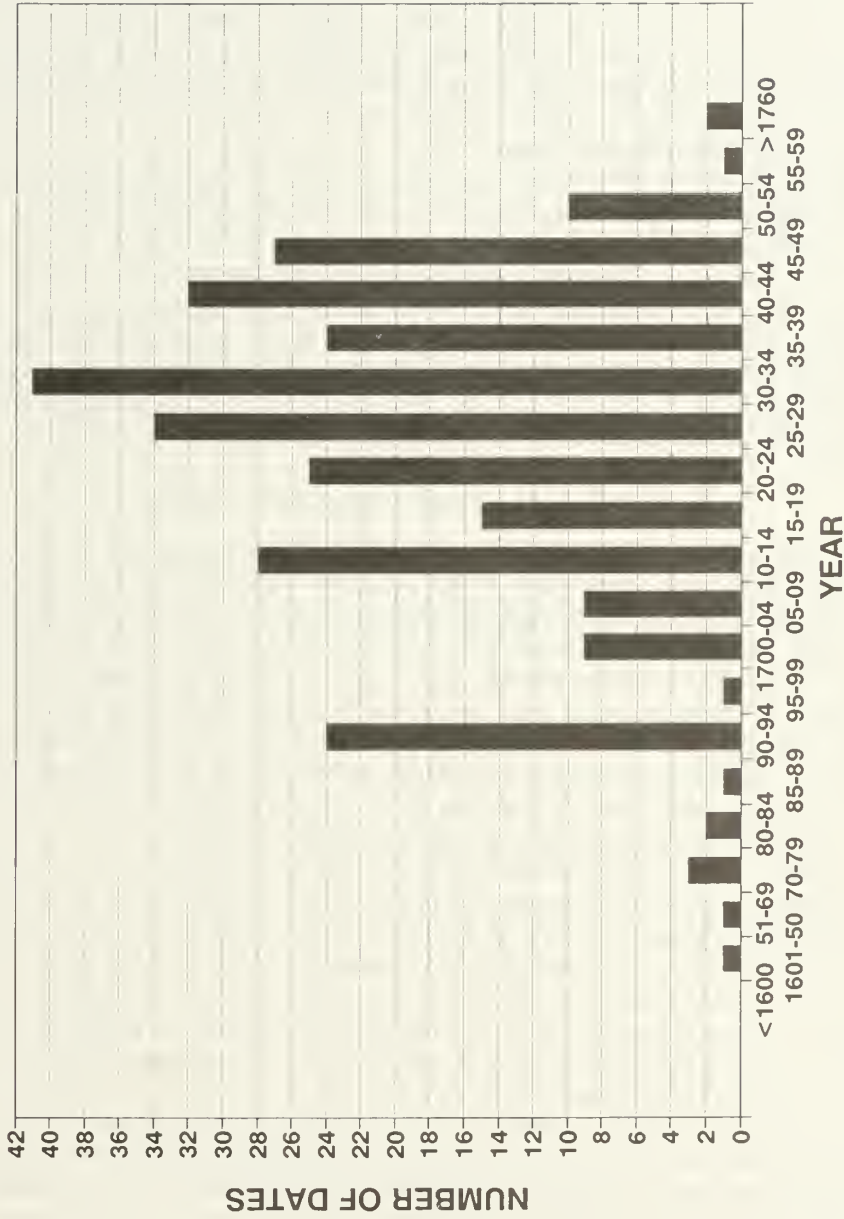


Figure 5.3. Distribution of cutting dates from the Dinetah Dating Project.

the Dinetah. The large number of cutting dates from this four-year period therefore reflects the behavior of dendrochronologists and not that of pueblo inhabitants. The cutting dates have important temporal implications (Towner and Dean 1992), but the number of dates is simply an artifact of repeated sampling by various researchers.

There is an apparent gap in the distribution of cutting dates between A.D. 1695 and 1700. This gap is less significant when the bias underlying the Tapacito peak is explained, but it still exists. Based on a much smaller number of dates, Powers and Johnson (1987:127) identified the gap and suggested that it is a result of an inadequate sample of pueblitos. After the first two seasons of this project, however, the majority of the structures in Dinetah that have datable wood have been sampled and the gap still exists; as discussed below, I believe this gap is real and has significance for the interpretation of all of the pueblitos.

The general trend in the data is toward an increasing frequency of cutting dates from 1700 to a peak at 1725–1734 and a rapid decline beginning in 1750. Two small declines, at 1715–1719 and 1735–1739, remain unexplained; the first occurs during the initial Ute and Comanche advance into New Mexico and is the opposite of what we would expect if the pueblitos were built in response to this expansion. The second decline is most likely a result of sampling and preservation biases, although other factors cannot be discounted at this time. The cutting dates indicate that the Dinetah was probably abandoned sometime in the mid to late 1750s. The distribution of cutting dates suggests that several different factors may have contributed to the pueblo phenomenon and that seeking a single causal explanation may mask the true variation in these structures.

Anomalous Dates and Construction Episodes

The next step in the analysis is to identify construction episodes at individual pueblitos. A cutting date provides information about a biological event, the death of a tree, whereas identification of construction episodes provides information about a behavioral event, the building of a room. Construction episodes are defined on the basis of a cluster of cutting or near-cutting dates indicating cultural activity within a certain time frame. In order to identify date clusters we must first identify and explain anomalous dates that obscure the behavioral event of interest. Individual dates are only anomalous within an archaeological context; as such, the first step in identifying anomalous dates is definition of a target event (Dean 1978)—in this case, the construction of an individual room or pueblo. Since the pueblitos are the structures of interest, dates derived from hogans ($n = 88$) within the site complexes are not included in the analysis.

The uneven nature of the pueblo site tree-ring data necessitated two different strategies for identifying anomalous dates. Date clusters, and hence construction episodes, were defined differently for the poorly provenienced samples collected prior to 1970 and for the samples collected as part of the current project. For the poorly provenienced samples, a cluster is defined as two cutting dates from the same pueblo within a five-year period. For the recently collected samples, two cutting dates from the same room within a three-year period define a cluster. In both cases, near-cutting and non-cutting dates may be used to strengthen, but not define, a cluster unless those dates are the latest dates from a particular room.

Several examples may be used to demonstrate the methods of defining clusters. Site N-USJ-GLJ-QQ, sampled by the Navajo Land Claim project, yielded three cutting dates: 1703G, 1715ine, and 1725c (Stokes and Smiley 1963). These three unprovenienced dates span a period of 22 years and cannot be used to infer any construction episodes. They indicate some activity during the early eighteenth century, but more refined estimates of the occupation are not possible.

The site of Dos Cerritos (LA 2136) was sampled by Hall in 1938 and yielded six dates: 1725v, 1727v, 1728v, 1733r, 1734r, and 1734r (Robinson et al. 1974). Although none of the samples are provenienced beyond the site level, we can identify at least one building episode in 1733–1734. The near-cutting dates in the late 1720s may indicate an earlier building period, but without exact provenience information this type of conclusion would be speculative.

The Hooded Fireplace site (LA 5662) was sampled by Towner and Dean in 1991 and yielded nine dates: five cutting dates at 1723 and non-cutting dates of 1721vv, 1722vv, 1722vv, and 1723vv (Towner 1991). Because the non-cutting dates predate the cutting dates by only one or two years and because we know the exact provenience of all the samples, we can extrapolate from one room to another and infer a single building event. Using the distribution of cutting dates within the pueblito, the architecture of the structure, and the non-cutting dates, we can infer that the entire pueblito was built in a single construction episode in 1723.

The last identified construction episode in Dinetah, at Simon Canyon (LA 5047), demonstrates the use of near-cutting dates to identify a building event. Recent sampling yielded four dates: 1691G, 1738G, 1754 + G, and 1754 + G (Towner 1991). The site is a single room, and architectural data indicate that it was built as a single event. This event must have taken place during or shortly after 1754. The earlier cutting dates therefore represent the use of dead wood by the builders, a phenomenon made possible by the introduction of the metal axe in post-contact times.

Distribution of Construction Episodes

The temporal distribution of date clusters (Figure 5.4) indicates 46 construction episodes at 26 sites during the Gobernador phase. The range of construction episodes is between 1694 and 1754—almost identical to the bulk of the cutting date distribution. Within this distribution, however, are several important high and low periods of construction. The majority of the pueblito construction occurred between 1725 and 1755, lending support to Carlson's (1965) assertion that the structures were built during the Navajo-Spanish peace (Reeve 1959), probably in response to Ute or Comanche pressure.

The gap in the cutting dates after 1695 is also clearly evident in the construction episode analysis. Tapacito Ruin was completed by the fall of 1694 (Towner and Dean 1992) and no other structure was built in Dinetah until 1709. A surge in building between 1709 and 1714 was followed by approximately ten years of very little activity. Beginning in 1725, pueblito construction increased dramatically and continued until 1750, when most of the structures were complete. In the early 1750s, single rooms were added at 3 Corn Ruin and Gould Pass Ruin, and the small pueblito in Simon Canyon was constructed. No structures were built in the Dinetah after 1754, and the area was probably abandoned by the early 1760s. The spatial characteristics of the construction episodes may aid us in interpreting the pueblito phenomenon. As mentioned above, Tapacito Ruin was constructed in the fall of 1694 (Towner and Dean 1992). It is located in the southern portion of the Dinetah. The surge in construction fifteen years later (1709–1714) is confined almost exclusively to the northern periphery of the Dinetah, approximately thirty kilometers away. One site (NLC-E-CL-UL-U) in the southern area may have been constructed as early as 1711, but poor provenience of the samples makes this interpretation questionable.

The small number of cutting dates noted for the period between 1715 and 1719 is accentuated in the construction episode analysis. A single room was added to Frances Canyon Ruin (LA 2135) and some construction occurred at NLC-N-USJ-GLJ-E, both northern sites, but these are only construction episodes during this period. The inception of the Navajo-Spanish peace in 1716 may be responsible for this decline, but the Ute advance is not reflected in construction activity.

The period between 1720 and 1724, which had 25 cutting dates, again shows the hazards of using only cutting dates to infer activity, thereby introducing sample bias, since most of these dates come from two sites, Frances Canyon Ruin and Hooded Fireplace. Two rooms were added at Frances Canyon Ruin (LA 2235), a northern site, and the entire southern pueblito of Hooded Fireplace (LA 5662) was constructed during this period. The use of cutting dates, therefore, results in overrepresentation of the amount of building activity in the area at that time.

The increase in building began in 1725 and continued until 1750. The small decline in the number of rooms built between 1735 and 1739 is interpreted as a sampling problem. During the initial years of the boom (1725–1729) most of the activity took place in the south, where five of the six con-

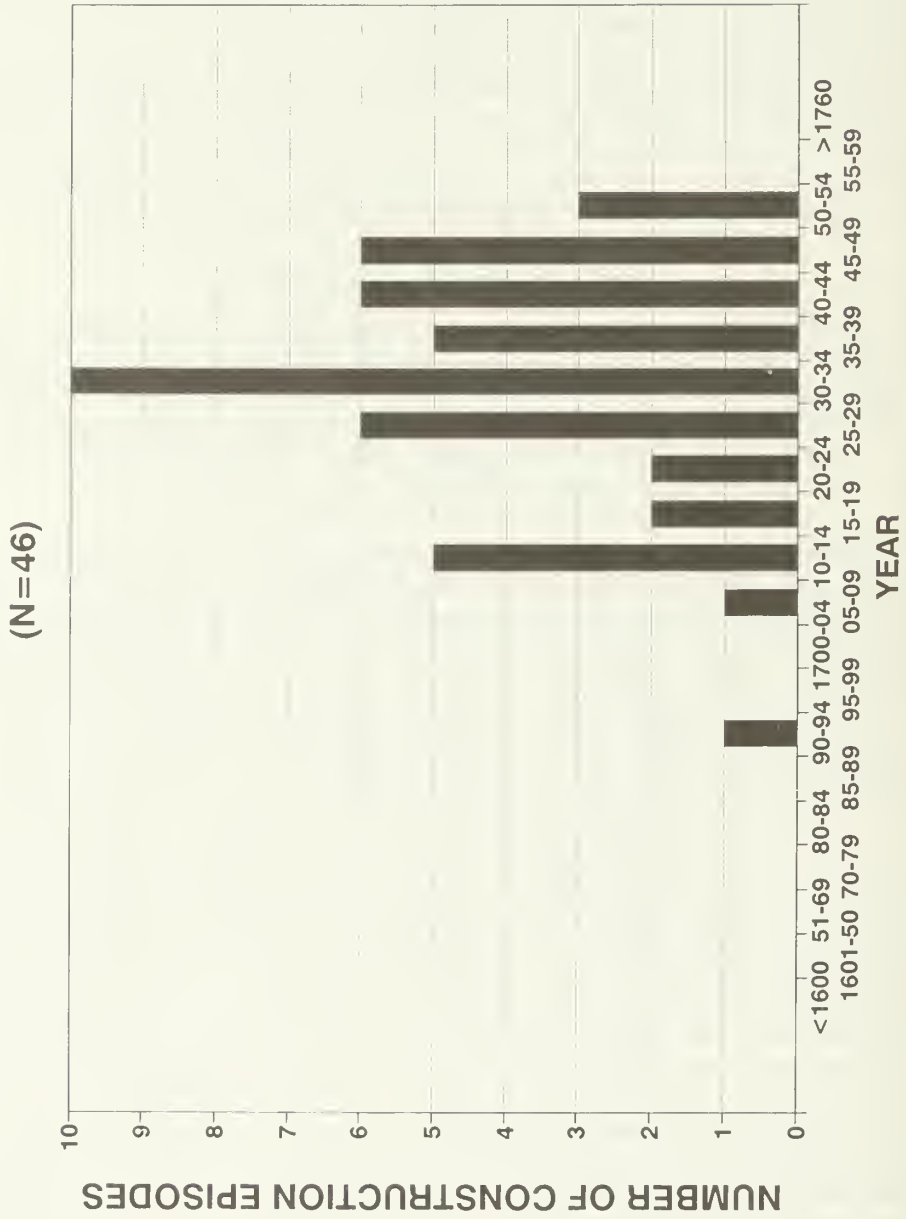


Figure 5.4. Construction episodes in the Dinetah (see text for explanation).

struction episodes were completed. Between 1730 and 1750, however, construction activity was not spatially restricted; sites were built in the north, south, and east.

The final period of pueblito construction in the Dinetah was again confined mostly to the north. Rooms were added at Gould Pass Ruin (LA 5659) and Old Fort Ruin (LA 1869) between 1751 and 1753, and the small pueblito in Simon Canyon (LA 5047) was built in 1754. Among the Dinetah sites presently known, Simon Canyon was the last structure built in Dinetah. A single pith date (1768p) from a tree growing in the courtyard of Old Fort Ruin (Powers and Johnson 1987:14) suggests the site, and probably all of the Dinetah, was abandoned by that time. Pith dates should not be considered strong evidence for site abandonment, however, owing to the nature of tree growth and to variety in sampling procedures.

Discussion

The tree-ring data from the pueblito sites do not support the traditional interpretation that the pueblitos were built as a response to the Spanish Reconquest. The temporal and spatial distribution of pueblitos suggests that this phenomenon is much more complex than previously thought.

The historical documents and oral traditions used to suggest an influx of refugees after the failed revolt of 1696 do not correlate with the construction of pueblitos in the Dinetah. Only one site, Tapacito Ruin, correlates with the Reconquest, and it may have been a response to De Vargas' campaigns of 1693 or 1694, not the attempted revolt of 1696. Tapacito, built in the fall of 1694 in a non-defensive position, is very different architecturally, ceramically, and temporally than the other pueblitos (Towner and Dean 1992); it has massive rubble-core and veneer walls approximately one meter thick whereas other pueblitos have single-coursed "columnar" architecture with plastered walls. It contains the highest proportion of Rio Grande ceramics of any pueblito analyzed (Marshall 1991), although the percentage is still relatively small (7.5%). I believe that temporally, architecturally, ceramically, and geographically Tapacito should be viewed separately from the other pueblitos of Dinetah.

The construction boom of 1709–1714 is confined almost exclusively to the north. Sites started or added to during this period are visually linked to each other, but not to Tapacito, and include 3 Corn Ruin, Frances Canyon Ruin, and Cabresto Mesa Tower (Jacobson, Fosberg, and Bewley 1991). The cause of this boom is unknown; Ute pressure may have been a factor, but historical documents suggest that the Ute did not become a problem until a few years later.

The majority of construction activities at the pueblitos, between 1725 and 1750, postdate any major conflict with the Spaniards and coincide with the Navajo-Spanish peace (Reeve 1959). The structures were probably built in response to the Ute and Comanche advance into New Mexico, but more than one factor may have provided the impetus for pueblito construction.

Conclusions

The Dinetah Dating Project has provided detailed temporal information for most of the pueblitos in the Dinetah. Although additional fieldwork is planned for 1992, the distribution of construction episodes is not expected to change dramatically. If, as the data suggest, most of the pueblitos were built long after the Spanish Reconquest, what happens to the refugee influx hypothesis? If there was an influx of Puebloans after the failed revolt of 1696, where were they living? Only one structure in Dinetah, Tapacito Ruin, is possibly indicative of a Puebloan presence, and it predates the failed revolt. If there was no massive influx of Puebloan refugees, we must seek other explanations for the adoption of numerous Puebloan cultural traits by the Dinetah Navajo. Additional research at these sites may provide important information not only about Navajo history but about the processes of cultural exchange in the early historical period as well.

The tree-ring data support recent inferences by Hogan (1991) that the structures were built by the Navajo without the aid of Puebloan refugees. We should continue to look at the variation exhibited by these structures and not assume they were all built in response to Ute and Comanche pressure. From a strictly temporal perspective, much more variability is evident in these structures than was previously thought, and additional research into the architecture, ceramic, lithic, and faunal assemblages is necessary before we can understand this complex adaptation to the rapidly changing eighteenth-century world of the Dinétah.

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Archaeological Investigations at Fort Cummings

Edward Staski

During the summers of 1989 and 1990 the New Mexico State University (NMSU) archaeology field school was held at the site of Fort Cummings in southwestern New Mexico. Twenty-three students and five staff members participated in these six-week field seasons. During the summer of 1991 limited testing was conducted by a small group of students. The field school is scheduled to return for a final summer season in 1992.

Fort Cummings is located approximately fifteen miles northeast of Deming, New Mexico. It lies near the base of Cooke's Peak, at the entrance to Cooke's Canyon, and consists of a number of standing adobe walls, numerous piles of melted adobe, extensive scatters of refuse, and several obvious trash concentrations.

Elevation at the site is approximately 4800 ft above sea level. The climate is arid, with rainfall averaging about nine inches annually. The dominant vegetation consists of scrub mesquite, yucca, Mormon tea, fourwing saltbush, creosote, and grama grasses. Most of the fieldwork was conducted on the portion of the site that lies on Bureau of Land Management (BLM) land. The remainder of the site, which was the subject of limited mapping and reconnaissance activities, is located on a large, privately owned ranch.

The fort was officially in use from late 1863 until the summer of 1887, with several periods of abandonment and reoccupation. It was named after Major Joseph Cummings, First New Mexico Cavalry, who had been killed by Navajos. The original outpost was 320 by 360 ft and is said to have provided sufficient space for 100 men and 65 horses and mules. This compound was surrounded by a 10-foot-high adobe wall to guard against Apache attack. The fort was subsequently expanded.

Throughout its existence, Fort Cummings played a key role in various Apache campaigns. Indeed, the fort was established in the heart of Apache territory and served as an important base for patrols and expeditions against warriors led by Cochise, Victorio, Nana, and Geronimo. The fort was abandoned in the late nineteenth century for a combination of reasons, including the arrival of a transcontinental railroad line and military reorganization in the region (Couchman 1988, 1990).

The NMSU field schools and testing endeavors have concentrated on several locations within the Fort Cummings area: the main fort, which consists of the several adobe and stone structures of Fort Cummings proper (Figures 6.1–6.4); the Fort Cummings Cemetery, located some 600 m to the southeast of the main fort (Figure 6.5); the original Butterfield Overland Stage station, adjacent to the cemetery but predating the fort (Figure 6.6); a large concentration of refuse thought to be a major trash dump of the fort; an L-shaped complex of stone walls, which was probably a corral (Figure 6.7); additional corrals near Cooke's Spring; and the spring house, nearly 250 m to the southwest of the main fort and historically associated with the Southern Pacific Railroad. Several years ago the BLM funded the reconstruction of the roof of this structure.

Each of these locations was the scene of mapping or excavation, or both. As a result of this work and subsequent analyses, many of the research questions in the original research design (Staski 1989a) have been addressed, and new ones have been formulated (Staski 1990, 1991). Several undergraduate students have earned college credit for learning key laboratory and analytical tech-



Figure 6.1. Main fort, north.

niques by working with the Fort Cummings collection. Several graduate students are currently writing master's theses on aspects of the fort's history and archaeology.

General Research Concerns

Fort Cummings was constructed shortly after the Civil War and remained in use well into the 1880s (Figure 6.8). At the beginning of occupation the territory of southern New Mexico had recently been acquired from Mexico, as part of the settlement of the Mexican War and the Gadsden Purchase. The region was essentially undeveloped, on the very edge of the expanding United States' western frontier. By the time of the fort's last official abandonment the economy of the region had developed and become closely tied to the rest of the country, largely because of the arrival of the Southern Pacific and Santa Fe railroads and an increasing Euroamerican population. Much had changed during the two decades of the fort's existence (see White 1991 for a general historical overview).

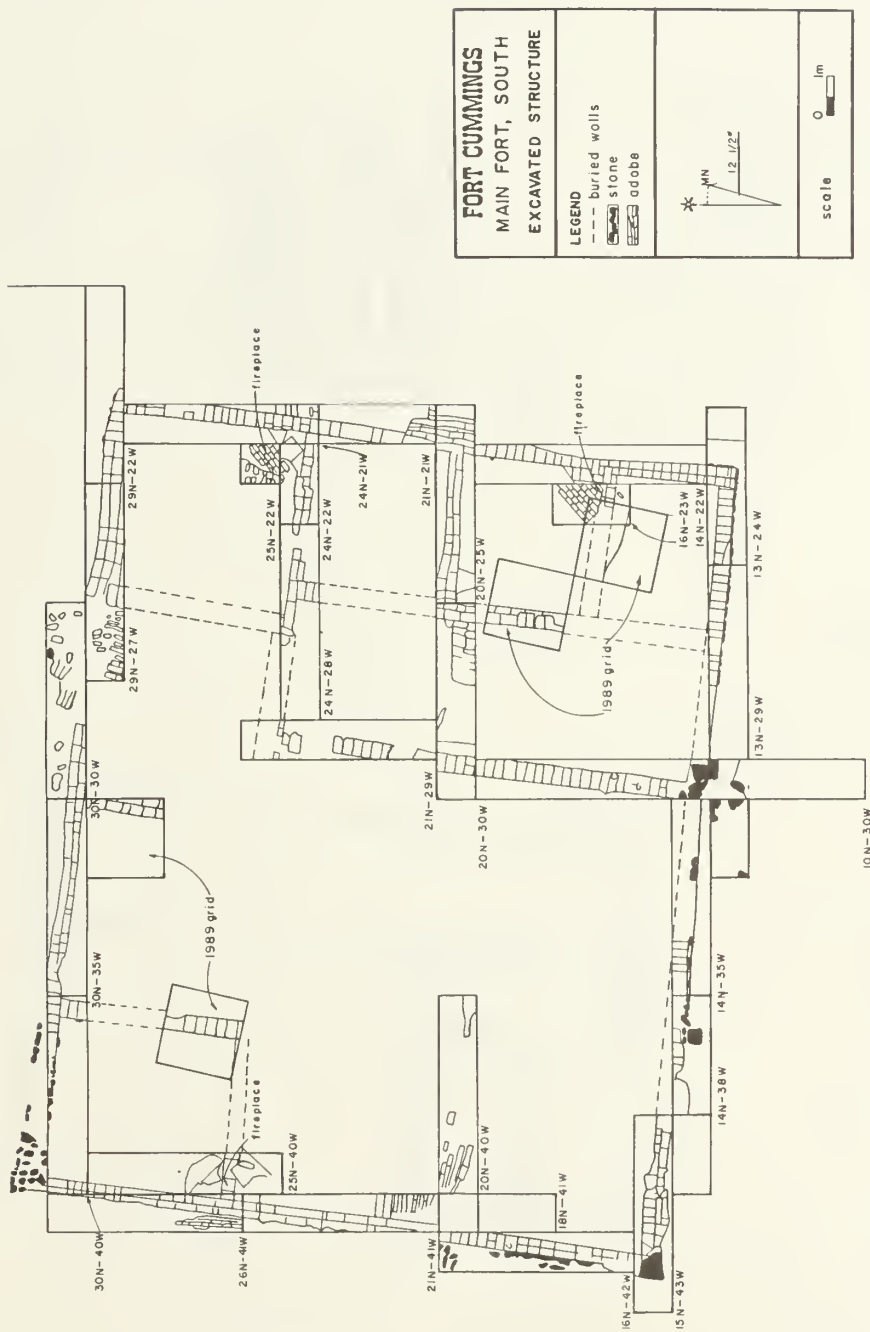


Figure 6.2. Excavated structure in main fort, south.

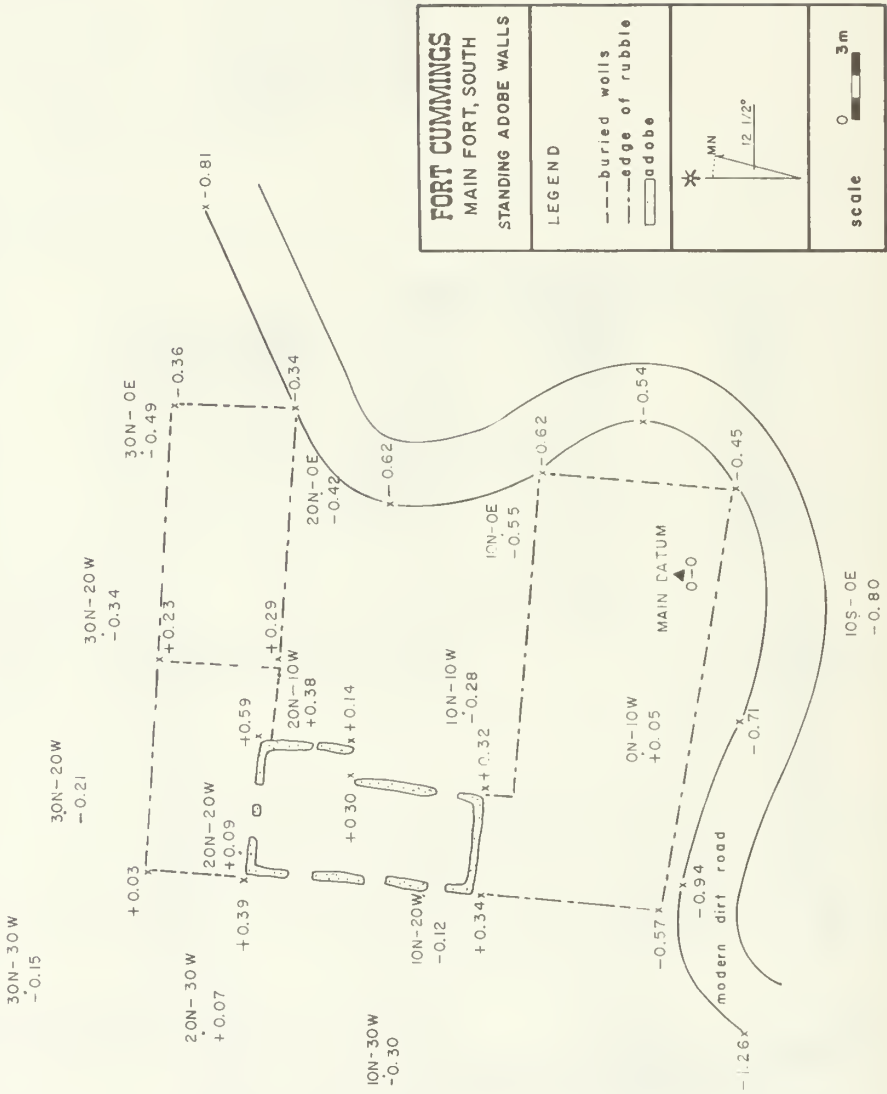
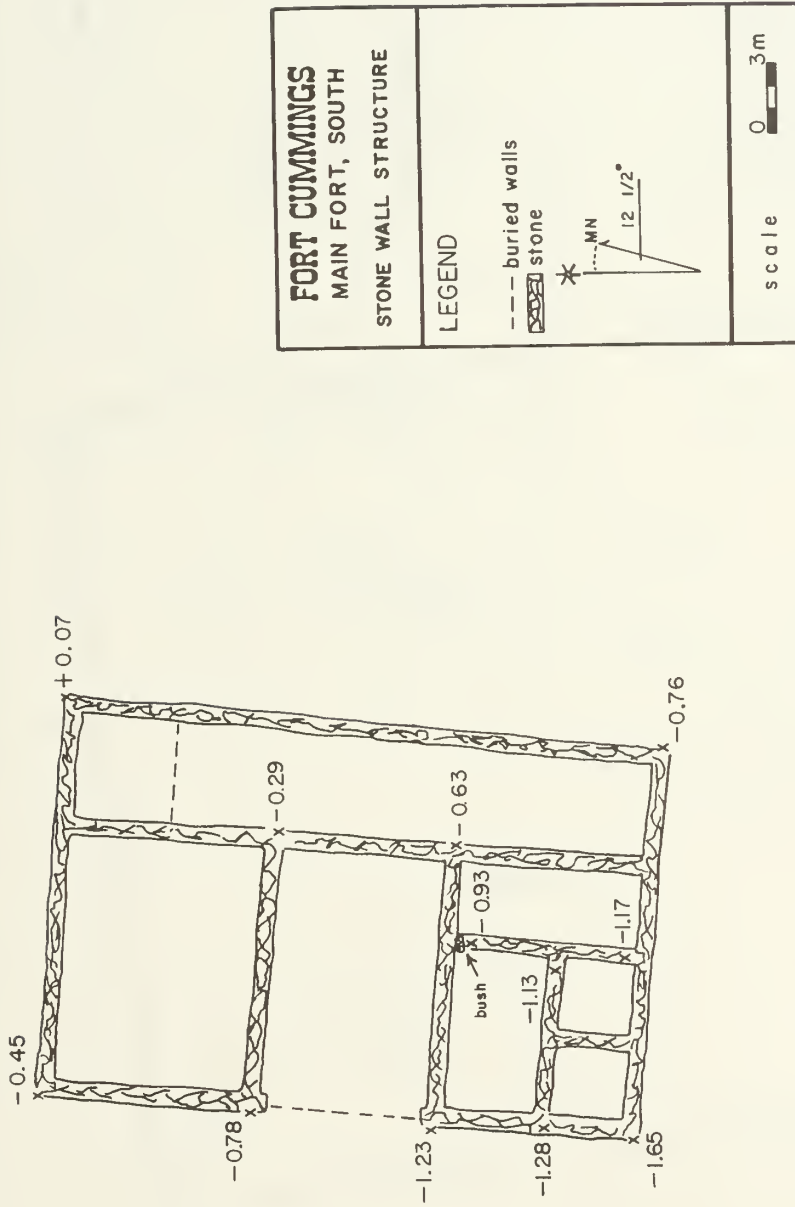


Figure 6.3. Standing adobe walls in main fort, south.



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Figure 6.4. Stone wall structure in main fort, south.

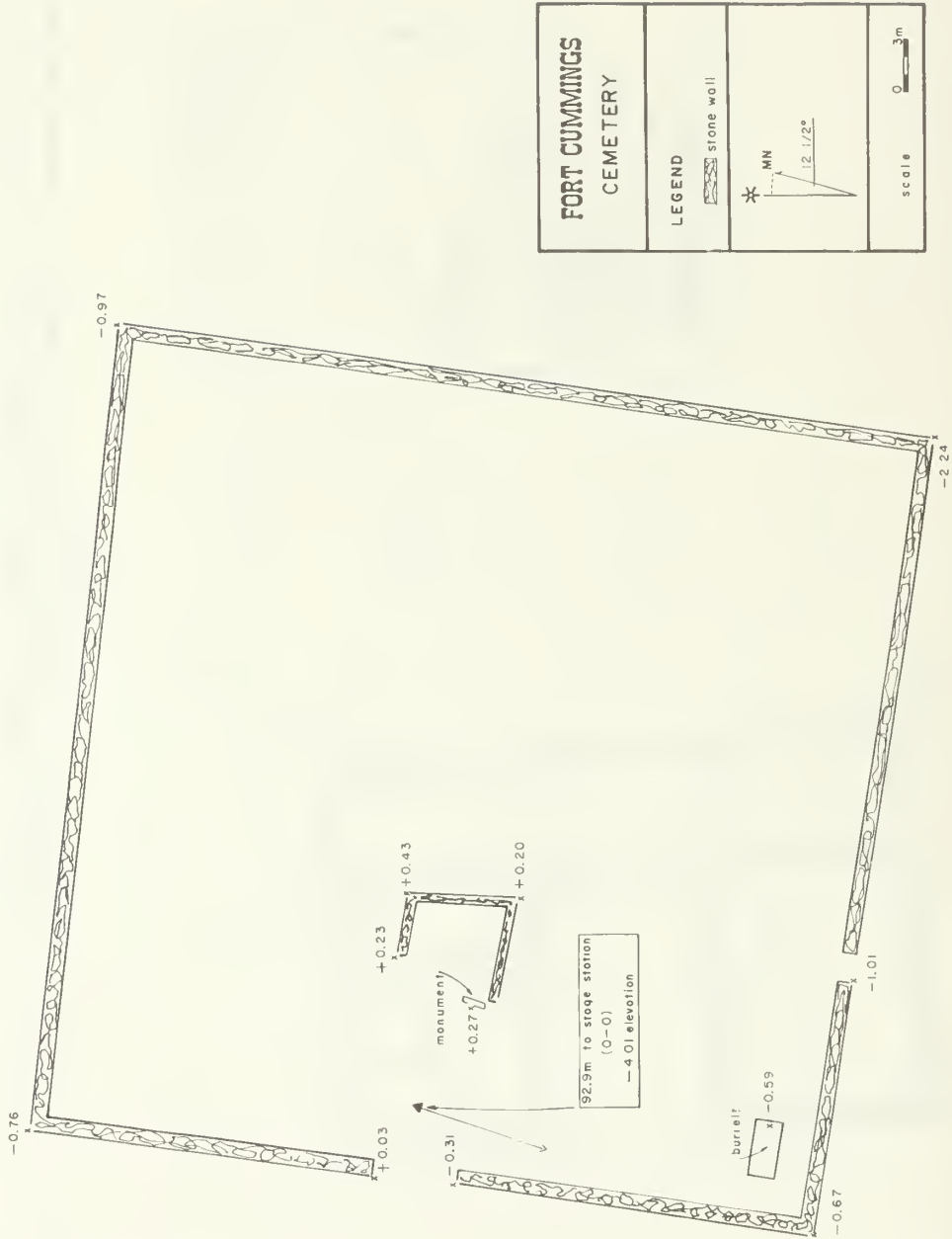


Figure 6.5. Cemetery.

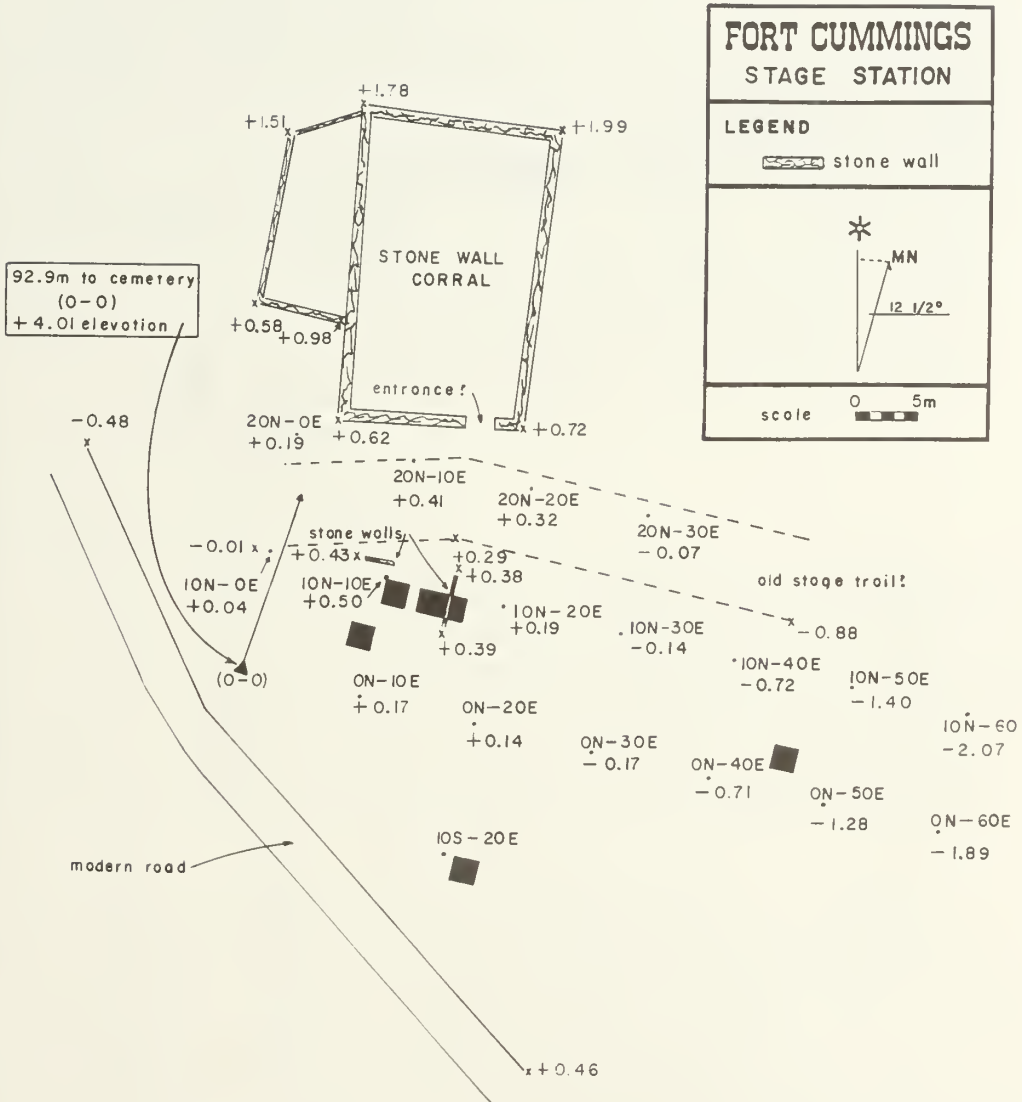


Figure 6.6. Stage station.



Figure 6.7. L-shaped complex.

The soldiers at Fort Cummings acted as representatives of United States society and culture, and the installation itself served as an example (and a symbol) of growing Euroamerican power in the region. This growth in power was first accomplished at the expense of Mexico, though most of the time the greatest impact of Fort Cummings was on Native Americans, especially the Apache. Conflict with the Apache continued throughout the period of occupation, and their presence in the area affected all soldiers' lives and shaped official policy. Thus, the overarching theme of the research at Fort Cummings has been culture contact on the frontier – conflict with the Apache and their eventual subjugation.

A secondary theme has concerned the American West. This multifaceted and abstract historical phenomenon is recognized as a powerful collective representation that encompasses various behavioral components (Smith 1957). It moved across the United States as both a symbolic and an actual border (similar to an ethnic “boundary”; Barth 1969) between expanding Euroamerican culture and traditional Native American and Hispanic cultures. The site of Fort Cummings, representing one of the earliest incursions of Euroamerican society into the area, seemed an ideal setting for its investigation.

Research at Fort Cummings was also structured so comparisons could be made with results from archaeological excavations at Fort Fillmore (occupied from 1851 to 1862), conducted by NMSU field schools in 1986 and 1987 (Powder 1988; Staski 1989b, 1989c). This fort, located some sixty miles to the east, was abandoned less than two years before Cummings came into existence, and both were designed to serve similar functions. Comparative study has resulted in a broader understanding of Southwest frontier history.

Specific Research Questions

The research questions (Staski 1989a, 1990, 1991) are fairly general in scope, as are the alternative hypotheses associated with each. This is appropriate, since the NMSU field schools represent some of the first historical archaeology in the immediate area. More detailed and precise research questions and hypotheses may be proposed during subsequent investigations. The research questions are also useful for comparative study because they are similar to the ones incorporated in the research design for archaeological investigations at Fort Fillmore (Powder 1988) and addressed during that project. Ideally, future NMSU field schools will be conducted at other comparable locations, such as Fort McRae and Fort Webster, and the same general research questions will again be addressed. A truly regional understanding of frontier military experiences would be the result.

Although sixteen research questions have been developed, only a few examples can be considered here. The first research question is an example of one of the project's broad historical concerns: What was the nature of the economic differences between officers and enlisted men at the fort? Either there were dramatic economic differences between officers and enlisted men, and officers had clearly higher economic status, or there were no dramatic economic differences between officers and enlisted men. The former was believed to be the more likely alternative before fieldwork began. Data needed to answer this question were thought to include archaeological measures of the availability of certain commodities (as evidenced in trash deposits) and observable architectural distinctions between officers' quarters and enlisted men's barracks. Available documentary materials were also considered to be critical.

The largest concentrations of trash clearly associated with the fort occupation were excavated at the trash dump – few commodities were found at the main fort, and those from the stage station and spring house cannot be tied to the military. Unfortunately, the nature of deposition at the trash dump does not allow separation of officers' and enlisted men's refuse – both are apparently present, and thoroughly mixed.



Figure 6.8 Fort Cummings circa 1886. Photo courtesy of the Museum of New Mexico, negative 76124.

Until discrete deposits of either officers' or enlisted men's trash are located, it will not be possible to answer this question with confidence. Informal reconnaissance to the west of the main fort, on private property, suggests that discrete deposits might be present in that area of the site.

Still, no evidence of expensive commodities – fine wines, spirits, china, utensils, or other imports – has been recovered to date. Neither are any dramatic architectural distinctions evident. From available information it seems that there were no dramatic economic differences between officers and enlisted men; at least, none are reflected in the material record investigated thus far.

Documentary evidence presents a somewhat different picture. As at other military outposts on the frontier, differences in economic status between officers and enlisted men at Fort Cummings are reported to have been striking. Apparently the status differences were especially dramatic at Fort Cummings because they correspond to an ethnic/racial distinction. All officers were Euroamerican, whereas at times many of the soldiers were members of the Thirty-Eighth Black Infantry (and possibly other African American units). Racial distinctions might have exacerbated economic distinctions – it is certain that they strained interpersonal relations to the point of riot and attempted mutiny (Couchman 1988:396–397, 1990).

Officers at many frontier forts appear to have enjoyed a life similar to what was experienced in more developed parts of the country. It was not uncommon for them to have their families and household possessions at the fort. They indulged in exclusive social events – special dinners, dances, and so on – designed to emphasize the high status of the participants. They apparently were supplied with the material trappings of high-status living, including fine wines, good foods, and other luxuries (Lane 1964; Wallace 1972).

This image is in sharp contrast to the conclusions drawn by Herskovitz (1978) from his analysis of the material culture at Fort Bowie, and to the daily experiences of the common soldier. The enlisted man's diet was monotonous. He possessed few, if any, luxuries, and in general a small number of material goods. Life was difficult, lonely, and boring most of the time, with few social occasions to enjoy. Clearly, a similar situation existed at other frontier forts, including Fort Cummings.

The second research question to be addressed here focuses more on the region surrounding the fort and less on the general military frontier experience: What was the nature of the impacts of

the local economies and cultures on the fort? Either the local economies and cultures played important roles in shaping fort life, and military personnel were dependent on local civilians in important ways, or the local economies and cultures did not play important roles in shaping fort life and the fort was, in this sense, independent and self-sufficient. Data needed to answer this question include archaeological measures of dependence on locally produced brownware ceramics; locally produced architectural materials, including adobe; and local civilian help with construction. Documentary evidence relating to the question was again considered important.

Even though Fort Cummings was a relatively isolated outpost, very few locally produced brownware ceramics have been recovered. In contrast, this common utilitarian ware, found throughout the region and beyond during the nineteenth and early twentieth centuries, was a significant component of the ceramic assemblage recovered from Fort Fillmore (Staski 1989b, 1989c). Perhaps the proximity of La Mesilla and other Hispanic communities played a part in its presence there – no comparable community was in the vicinity of Fort Cummings.

Most of the adobe bricks at Fort Cummings are of poor quality with irregular shapes and large inclusions of straw and pebbles. At Fort Fillmore the adobe was well-made, though construction methods were poor – few foundations were dug, and walls were often built atop eolian sand and refuse. Foundations at Fort Cummings were often of stone and quite solid, though the degree of expertise in the use of adobe varied.

These archaeological observations suggest that the local economy did not play an important role in shaping life at Fort Cummings. The fort was essentially independent and self-sufficient relative to the surrounding region. Still, documentary evidence shows that there was considerable interaction between the military and local populations. For instance, it is known that during the fort's early existence the army hired a local contractor to make adobe bricks and to help in construction (Couchman 1988:369, 1990), and there is little question that others were involved in daily tasks and activities. If nothing else, the proximity of Cooke's Spring must have attracted numerous local occupants, as it did travelers passing through. There were also more dubious interactions: concerns were expressed about the numerous "hog ranches" (houses of prostitution) in the vicinity, and the resulting possibility of disease. In response to these and other local distractions the army made several attempts to limit or eliminate civilian settlement near the fort, first (in 1868) by instituting a military reservation around it and later (in 1880) by enlarging this reservation considerably.

Another research question is more concerned with the condition of the site than with its history: What impacts have treasure hunting and recent recreational activities had on the site? Do the deposits retain their integrity? Archaeological measures of these activities include shovel holes, mixed deposits, a lack of materials thought valuable by treasure hunters, tire tracks, and other signs of vandalism.

There is little question that treasure hunting and recent recreational activities have impacted the site. Several lines of evidence indicate these activities. First, a number of shovel holes and back-fill piles (in some cases consisting of screened dirt) have been left by treasure hunters, most notably to the east of the stage station and throughout the trash dump. Some were no more than several weeks old when first noted. All were recorded during the first field season; no disturbance was noted in 1990. Treasure hunting appears to have decreased with the onset of the project.

Second, the field school itself was visited on a fairly regular basis by people who obviously had an interest in treasure hunting – this occurred during both field seasons. Third, the owner of the private land, who is committed to preserving the site, indicated that treasure-hunting activities have been occurring for several decades.

Still, the majority of the archaeological record appears to be intact. No extensive subsurface disturbance was noted – there is no evidence of heavy machinery, for instance. Even features immediately below the surface, including many adobe walls and fireplaces at the main fort, were not

disturbed very much. Therefore, treasure hunting and recent recreational activities do not appear to have had a profound impact on the site.

Conclusions

The three research questions discussed here are a representative sample of the types of issues we hope to address during the archaeology field school at Fort Cummings. There is still more work to be done, and the 1992 season offers opportunities to investigate areas and issues not yet explored. For example, we plan to conduct excavations at the main fort on private land for the first time. We will attempt to locate and sample trash deposits that are clearly associated with either officers or enlisted men. When this area was mapped in 1990 it was judged to have great potential. It is the oldest part of the fort, and several small, discrete deposits were observed. If permission is granted, the 1992 field effort will be concentrated there.

Subsequent field seasons will lead to an ever-increasing understanding of Fort Cummings and the frontier Southwest. Furthermore, these future endeavors would complement long-term BLM management proposals for the site by increasing public understanding and awareness. The site of Fort Cummings could become a showcase ongoing scientific and educational project.

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Archaeological Investigations at Fort Craig

Peggy Gerow

Located approximately thirty miles south of Socorro, New Mexico, Fort Craig was established in the spring of 1854 as a replacement for Fort Conrad, which was situated approximately nine miles to the north. Named for Capt. Louis Craig, who had been murdered by deserters in California two years earlier, Fort Craig was built for essentially the same reason as Fort Conrad—to protect the settlers, control the Indians, and guard the north-south route along the Rio Grande. Its location just off the Camino Real, the “Royal Road” that was the route to the administrative and market centers of northern Mexico, actually afforded better protection to travelers than its predecessor did (Bender 1934:348).

Fort Craig is situated on an old terrace 72 feet above the Rio Grande at an elevation of 4314 feet. The site has a commanding view of the Black Range of the San Mateo Mountains to the west, the Fra Cristobal Range to the south, and the San Andres Range far to the east. The fort is located at the northernmost edge of the Jornada del Muerto (the Journey of the Dead Man), the vast arid area that stretches for more than eighty miles down the east side of the Fra Cristobal Range. According to an 1875 report, “the climate [at Fort Craig] is variable; in summer the heat is very great; in winter there is a slight frost, and some little snow. This season is disturbed by the great storms of dust which blow, from the west principally, over this post as well as over all the lower posts in New Mexico, thereby marring what would otherwise be a delightful climate at that time of the year. The dust at times is stifling. The prevailing winds in summer are southwest; during winter from the north” (Billings 1875:250).

History of the Fort

Fort Craig is a large complex of adobe and rock buildings surrounded by an earthen ramp and ditch with two bastions (Figure 7.1); a third bastion was never completed. The buildings include quarters for two companies, officers’ quarters, quartermaster’s offices and warehouses, a guardhouse, hospital, blacksmith shop, wagon yards, stables, a sutler’s store, and a carpenter shop (Billings 1875; U.S. Army Headquarters, Military Division of Missouri 1876). The wall enclosing these buildings encompassed an area measuring 1050 by 600 feet, the longer dimension running roughly east-west (Billings 1875) (Figure 7.2).

Most quartermaster’s and subsistence stores were supplied from the depots at Fort Union, New Mexico, and Fort Leavenworth, Kansas, by rail and wagon. Certain items, such as beef, wood, corn, hay, and some lumber, were supplied locally by private contract to save the cost of military transport (Frazer 1983; Miller 1989). Six months’ worth of subsistence supplies were kept on hand (U.S. Army 1876). Prior to 1880 the nearest railroad stations were at Pueblo and Las Animas, Colorado, nearly five hundred miles to the north (Billings 1875; U.S. Army 1876). After 1880 supplies could be shipped by rail to San Marcial, about six miles north of the fort.

Life at Fort Craig has been described in both negative and positive terms. Information on daily life at the fort has been gleaned from post returns. Both family letters and official correspondence

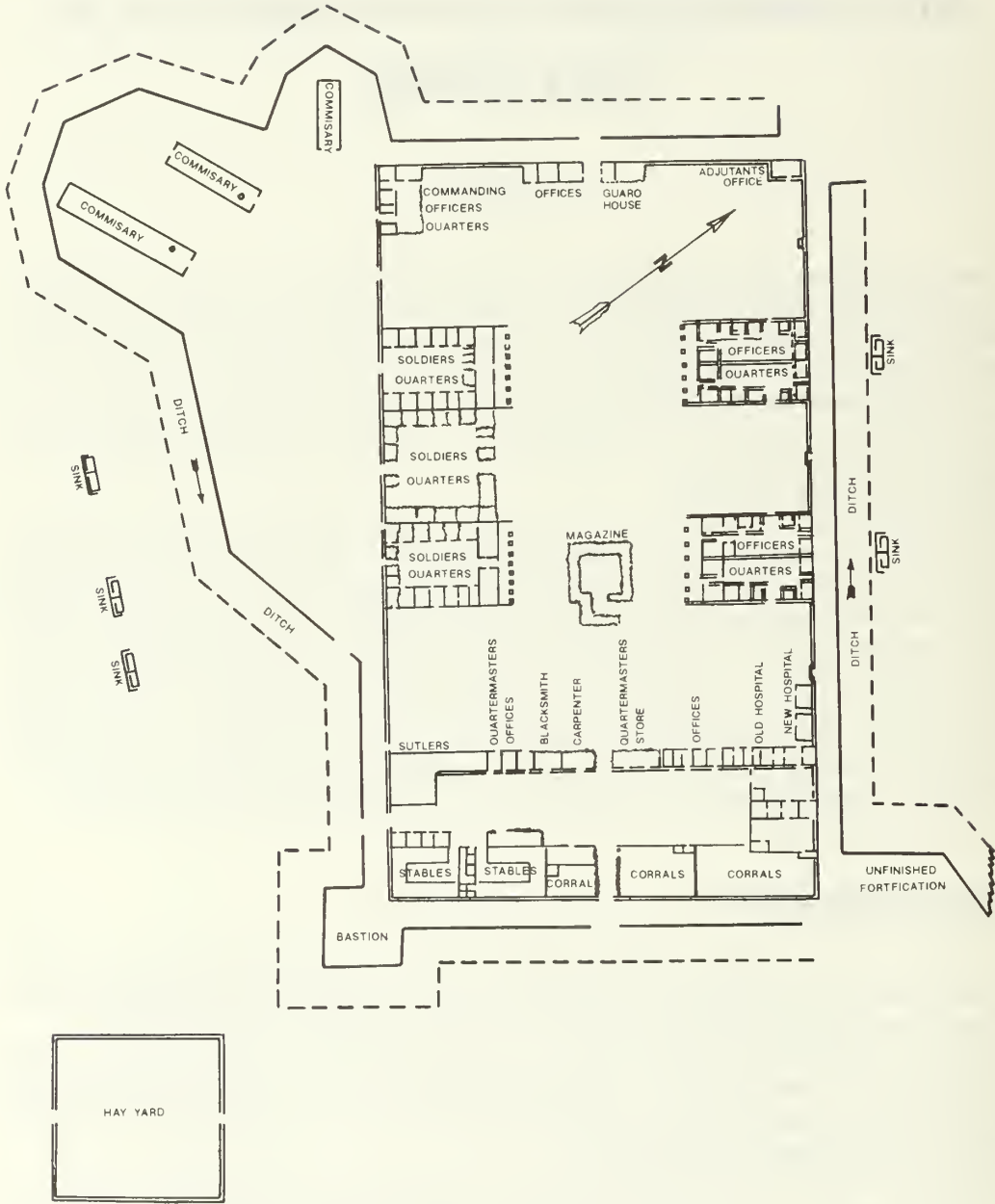


Figure 7.1. Plan of Fort Craig, 1866. The main gate is at the top; the western soldiers' quarters is the uppermost of the three contiguous buildings on the left.



Figure 7.2 Aerial photo of Fort Craig.

mention the mundane routine of military life. For the most part, it appears that Fort Craig was not a bad duty station, and by 1859 the post returns indicate that many of the amenities of life, including newspapers, magazines, books, and social events, were available to the occupants of the fort (Bureau of Land Management 1983).

Throughout its 31-year history the garrison played an active role in combating the Indians and providing protection for travelers and settlers in the area, though many times the soldiers arrived too late (Grinstead 1973:29). Settlements in the area flourished, and such towns as San Marcial to the north and Paraje to the south became active trading centers. The focal point of the fort's history, however, was the encounter with Confederate troops at Valverde in February 1862. Although the Confederates won the battle, at least according to tactical considerations, Col. Edward R. S. Canby, commander of Fort Craig, refused to surrender the fort (Grinstead 1973), thereby leaving a Union stronghold at the Confederates' backs (Figure 7.3).

After the Civil War, life at the fort returned to its normal pace – going on scouting parties, providing civilians with escorts, and other routine duties. By 1870 the Indian problems had dissipated with the defeat of Victorio, and by the late 1870s the most frequent entry in the post returns was “garrison duty.” In July 1878 the garrison was withdrawn and a small detail, consisting of one officer and seven enlisted men, was left to keep an eye on the buildings (Grinstead 1973:30).

In 1880 Victorio again went on the warpath and the facilities at Fort Craig were pressed back into service. This revival was to be short-lived; in September 1884 the fort was deactivated for good. By June 1885 the last of the troops left Fort Craig (Grinstead 1973:32). Capt. Jack Crawford (the “poet-scout”) and his family continued to live at the fort until 1894, when the land and buildings were sold at auction. The Valverde Land and Irrigation Company, the only bidder, bought the



Figure 7.3 Union soldiers on parade at Fort Craig circa 1865-1868.
Photo courtesy of the National Archives.

property for its appraised value of \$1070.50. Eventually the land was used for grazing (Grinstead 1973:33).

In October 1981 Fort Craig came under the jurisdiction of the federal government once again, when it was donated to the Bureau of Land Management by the Archaeological Conservancy, a private nonprofit organization. The ruins and the surrounding 160 acres had been donated to the conservancy by General H. L. Oppenheimer, president of the Armendaris Corporation, with the condition that it would be turned over to a government agency that could provide management and protection for the site.

The original Fort Craig Military Reservation covered an area of approximately 38 square miles, and the fort was situated nearly equidistant from the northern and southern boundaries of the reservation. Today the property consists of approximately 160 acres and for the most part is under the jurisdiction of the Bureau of Land Management. Except for the three storehouses, the guard house, the commanding officer's quarters (Figure 7.4), and the ramparts around the southwestern portion of the site, none of the buildings have standing walls; few of the mounds exceed a height of 1.5 m above the present ground surface.

Archaeology at Fort Craig

In the fall of 1989 the Archaeological and Historical Research Institute (AHRI) entered into negotiations with the Bureau of Land Management to establish a five-year field school at Fort Craig. This project was designed to serve a number of purposes: (a) to operate an archaeological field school for the training of students and the public; (b) to assess the nature and extent of cultural resources at the site and to serve as a guide for any future research that may be undertaken; and (c) to establish a foundation for the BLM's public interpretation program at the site.

Research at Fort Craig was structured to enable comparisons to be made with the results of archaeological excavations at Fort Fillmore and Fort Cummings. The three decades of occupation of Fort Craig roughly encompassed the occupation span of both of these forts. Fort Fillmore was manned from 1851 to 1862 and Fort Cummings from 1863 to 1885. All three were designed to serve similar functions, and comparative study should result in a broader understanding of Southwestern



Figure 7.4. Fort Craig commanding officer's quarters, 1990.

frontier history. Thus the Fort Craig research design was modeled after those of Fort Fillmore (Powder 1988) and Fort Cummings (Staski 1989), which center around three broad research topics – culture conflict, economics (both regional and local as well as personal), and environmental adaptation. The impact of vandalism on the integrity of the cultural resources at the fort has also been addressed (Gerow 1990).

As in all historical archaeology projects, the documentary record can supplement and complement the interpretations generated from the study of the material remains. Thus both archival and archaeological approaches have been followed, where possible.

The 1990 Season

During the first two seasons of work at Fort Craig the archaeological investigations focused on two different areas: the front gate and the western soldiers' quarters. The 1990 session concentrated on the areas to be impacted by the new walking trail (Gerow 1991), especially the trash scatter in front of the fort and the structural remnants on either side of the trail through the front gate (Figure 7.5). More than twenty-five volunteers were trained in surface collection procedures, excavation and mapping techniques, and in-field cataloging of artifacts.

Excavations in front of the fort indicate that the trash scatter was the result of postabandonment dumping. The original ground surface was as much as 30 cm below the modern ground level.

Inside the front gate, excavation revealed the exterior wall of the south guardhouse as well as remnants of the floor. Constructed from adobe bricks, this wall measures 50 cm wide, 3.5 m long, and an average of 60 cm above the modern ground surface. The wall interior is covered with several thin layers of white plaster over a coping of mud 2–3 cm thick. No plastering is evident on the exterior of the wall, and there appears to be no foundation. The floor was originally composed of a gypsum cement known as *jaspe*; wooden floorboards were added at a later date, but the material was probably scavenged when the fort was abandoned. Currently the floor is marked by a

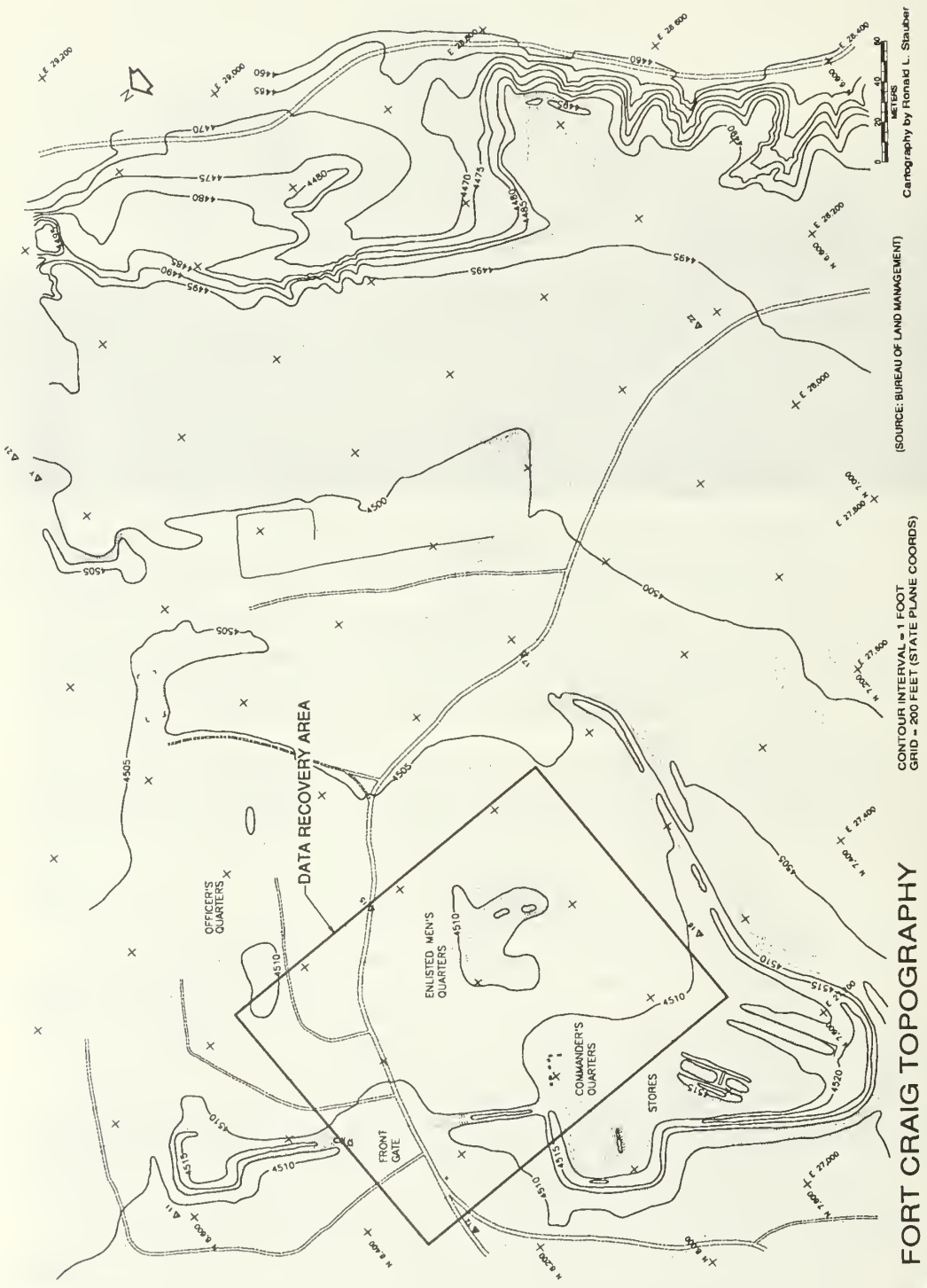


Figure 7.5. Topographic map of Fort Craig. The data recovery area is enlarged in Figure 7.7.

5–8 cm thick layer of highly compacted dirt.

No remnants of the adobe guardhouse walls were exposed in the grids excavated on the other side of the trail. This northern guardhouse consists of one room of basalt cobbles and two adobe rooms. The excavation units were expected to intersect the southern wall of this complex. The lack of structural remains in these units raises questions concerning the size and nature of the front gate. Unfortunately, little documentary evidence regarding the front gate is available. The only known description of the sally port was made in 1918 by a former post surgeon, who wrote that it was wide enough for wagons to pass through and was closed by heavy gates at night (McKay 1918).

Artifacts recovered during the 1990 excavations include glass bottle shards, window glass, brass buttons, bullets, animal bone, culinary items, miscellaneous metal fragments, and fragments of milled lumber. In addition, the lower portion of a square-toed boot (Figure 7.6) was found just inside the front gate. The artifacts recovered from outside the front gate proved to be of questionable provenience, although temporally diagnostic attributes on some of them indicate that the majority are probably related to the military occupation of the fort. The artifacts recovered during the first season did enable us to address at least three of the seven research topics—the role of the railroad, environmental adaptation, and the impact of vandalism.

The 1991 Season

The 1991 investigations focused on four rooms within the western soldiers' quarters—the last two rooms on the western side, the westernmost squad room, and the bakery (Gerow 1992). In addition, a 50 cm wide trench was excavated in the room abutting the north side of the bakery and a 1 by 2 m trench was excavated within the trash scatter behind the soldiers' quarters. This western portion of the soldiers' quarters is slated for reconstruction as a visitors' center. Fifty-one volunteers participated in the archaeological excavations over the course of the month-long field season.



Figure 7.6. Remains of a square-toed officer's boot dating to post-1872.

The soldiers' quarters were laid out in a U. This self-contained unit housed an entire company of men. Two squad rooms or dormitories were built across the northern or front end, with kitchens, mess rooms, storerooms, and laundresses' quarters located in the sides. The two ends and the front rooms partially enclose a small placita, where picket post rooms were constructed in times of emergency, such as during the Civil War.

Room 1 (Study Unit 5 on Figure 7.7) is one of two squad rooms located at the northern or front end of the western soldiers' quarters. A door on the eastern wall of this 51 by 21 ft room opens onto a hallway that connects the front porch and parade ground outside the enclosure with the placita inside the soldiers' quarters. Time constraints precluded the complete excavation of this room. Instead, 1 m wide trenches were placed across the room. More than 47 m² of fill was excavated from these cross-section trenches to expose the southern wall and portions of the northern, eastern, and western walls; portions of the front porch joists and floorboards; the remnants of the jaspe floor; and the center chimney.

The room walls were constructed of adobe bricks measuring 19 by 8 by 4 inches and were covered with several layers of white plaster underlain by half an inch of mud coping. The wall remnants range in height from 30 to 42 cm above the floor, which means that upwards of 10 feet of wall has melted away or fallen down. Some plaster with dark blue paint was evident along the outside of the front wall just above the porch floor joists. There was no evidence of a cobble foundation.

The floor of this room is represented by patches of jaspe measuring 2.5 to 3 inches thick. In areas without an intact layer of jaspe, the floor consists of a hard-packed level surface covered with friable jaspe fragments. No artifacts were found on the floor or in subfloor tests. Most of the artifacts recovered from the fill of this room were shards of window glass, although a red clay pipe with a molded face was found in the wall fall.

Excavations along the front porch exposed in situ floor joists ("two by fours") running parallel to the front of the building. A single row of joists is flush with the base of the exterior wall, and the remainder are spaced ca. 2 feet apart and extend out about 8 feet from the wall. Several floorboards still overlie the joists, and numerous glass fragments were found under the boards and between the joists. Wood shingles found above the floor joists indicate the porch had a shingled roof.

A chimney excavated along the north wall near the center of the room was constructed of adobe bricks and measured 1 m wide by 2.60 m long by 41 cm high. The back wall of the chimney was incorporated into the northern wall of the room. The center opening measured ca. 50 cm wide by 1.5 m long. Three tabular rocks were built into the adobe bricks and may have aided in the circulation of air. The lack of an associated fireplace means that the room was probably heated by a stove placed in front of this chimney.

Room 5, located four rooms south of Room 1 along the western row of rooms, is the only room that was completely excavated during the second field season. This room measures roughly 6.5 by 6 m (21 by 20 feet) and originally had walls 12 feet high. The surviving walls are between two and three feet high and 19 inches wide. The walls have up to one-half inch of mud plaster covered with numerous layers of white plaster. At least three plastering episodes are evident along the southern wall. No foundation was encountered.

The room had a raised board floor but most of the materials had been scavenged, probably after the fort was closed. The couple of remaining floor joists are milled "two by fours" resting on a fairly compacted surface. The remaining floor boards appear to be tongue and groove.

An interior doorway connecting with the room to the north was revealed in the northeast corner. This doorway measures approximately one meter wide and exhibits rounded plastered corners. No door jamb was evident, but this wood may also have been scavenged. Although no exterior doorway was found, a low, eroded area along the eastern wall with no plaster may indicate the location of an outer door that would have opened onto the placita.

The exact function of this room is not known, but it may have been either a mess room or a storeroom. Artifacts, which were recovered from all strata, are primarily bottle glass, nails, some

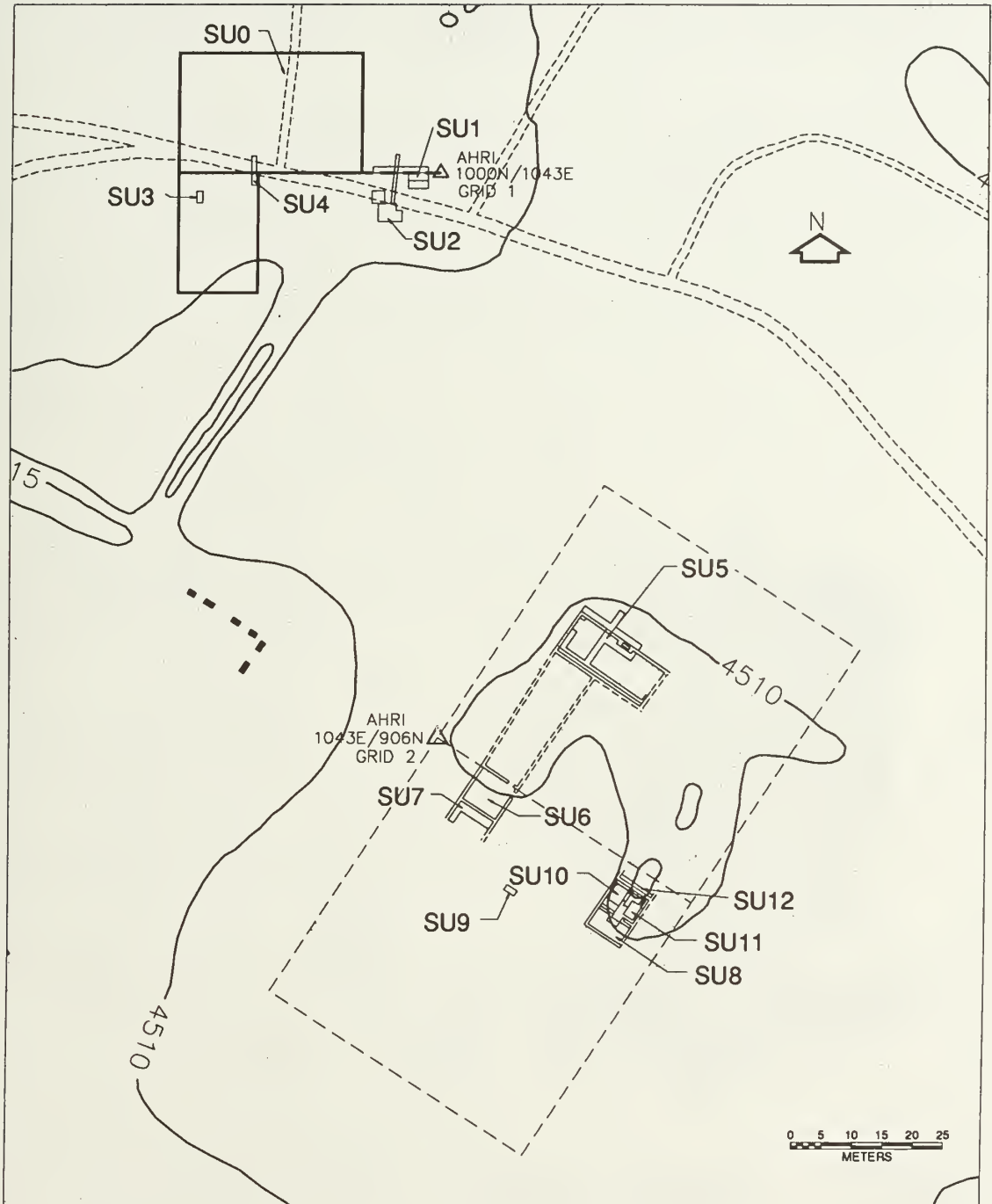


Figure 7.7. Locations of data recovery units in the area of the front gate (Study Units 0-4) and the western enlisted men's quarters (Study Units 5-12).

bone, and fragments of window glass. Some buttons, bullets, and a Hardee hat pin (Figure 7.8) also were recovered. No artifacts were found on the floor; however, numerous items were recovered from below the floorboards. These artifacts include a cache of .45-70 shells, a brass key, several Minie balls, cans, bullets, the base to a ceramic pitcher, nails, horseshoes, and a carbine sling buckle.

Located just south of Room 5, Room 6 measures approximately 6.5 by 6.5 m (ca. 21 by 21 ft). As with Room 1, time did not permit the complete excavation of this room. Two trenches were excavated to below floor level, one along the northern wall and one along the western wall. The exposed walls range in height from 25 to 40 cm and exhibit mud coping with thin layers of plaster. The southern wall of this room has eroded away, and there is no evidence of a foundation.

The profiles of the trenches indicate that Room 6 appeared to have a complex remodeling history, including one episode of burning, although this event does not appear in the records. Given the evidence of burning, and the large number of broken condiment bottles, this room was very likely a kitchen. Rooms 5 and 6 share a chimney located in the center of their conjoining wall and measuring 1.5 m long by 1 m wide. The chimney is flush with the wall in Room 5 but extends ca. 50 cm into Room 6. The portion of the chimney in Room 6 apparently underwent some remodeling, since a new layer of adobe bricks is evident. The flue measures 50 by 30 cm and was filled with ash, several bottle lips, and a kaolin pipe bowl and stem.



inches



cm

Figure 7.8. Jefferson Davis, or Hardee, hat pin usually worn on light artillery dress between 1855 and 1872.

The final room investigated, the bakery, is the last room on the eastern wing of the western soldiers' quarters. It consists of the brick and basalt-cobble support for an oven and two rooms that were built sequentially. These rooms may have functioned as a storeroom and a work room. The oven was built of bricks in the early 1880s to replace a smaller, inadequate adobe oven.

The bakery walls are adobe brick on a basalt cobble foundation. The floor was constructed of both jasje and tongue-and-groove wood. The only remodeling episode described in the historical records is the replacement of the oven, but the two rooms evidence repeated alterations. Artifacts consist primarily of bottle glass along with several buttons, a thimble, and watch gears. Most came from the roof and wall fall stratum.

Assessment and Interpretation

Preliminary assessment of the material remains indicates that the soldiers had few commodities and supplemented their rations with fish, duck, and turtle meat. The majority of bottle glass and ceramics postdate 1880, in-

dicating the railroad had a direct impact on the economy of the fort. Much of the wood used in the floors and ceilings came from within twenty-five miles of the fort, and the coal used in the stoves was obtained from mines located about thirty miles to the northeast. Very little artifact reuse is evident, suggesting that the shipment of supplies to the fort was fairly regular, barring floods and attacks on the supply trains.

The work during these past two seasons has shown that despite one hundred years of relic hunting, vandalism, and natural erosion, much of Fort Craig is more intact, and the fort is more complex, than previously thought. This work has also resulted in the generation of specific questions in addition to the general research issues that have already begun to be addressed – for example, the significance of the fire in Room 6, the remodeling episodes and room functions in the bakery, and the nature of the front gate. It also has shown the enthusiasm among members of the public for this type of project and a caring and concern for the fragile nature of these historic resources.

These excavations provide a unique opportunity for professionals and amateurs to work together to preserve our national heritage. They also provide data for the BLM's public interpretation programs and information displays, as well as lay the groundwork for the visitor management program. The material and data recovered will shed light on the fort's history in relation to national and regional developments, and it will provide for the interpretation of this history via the study of both the documentary and archaeological records.

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