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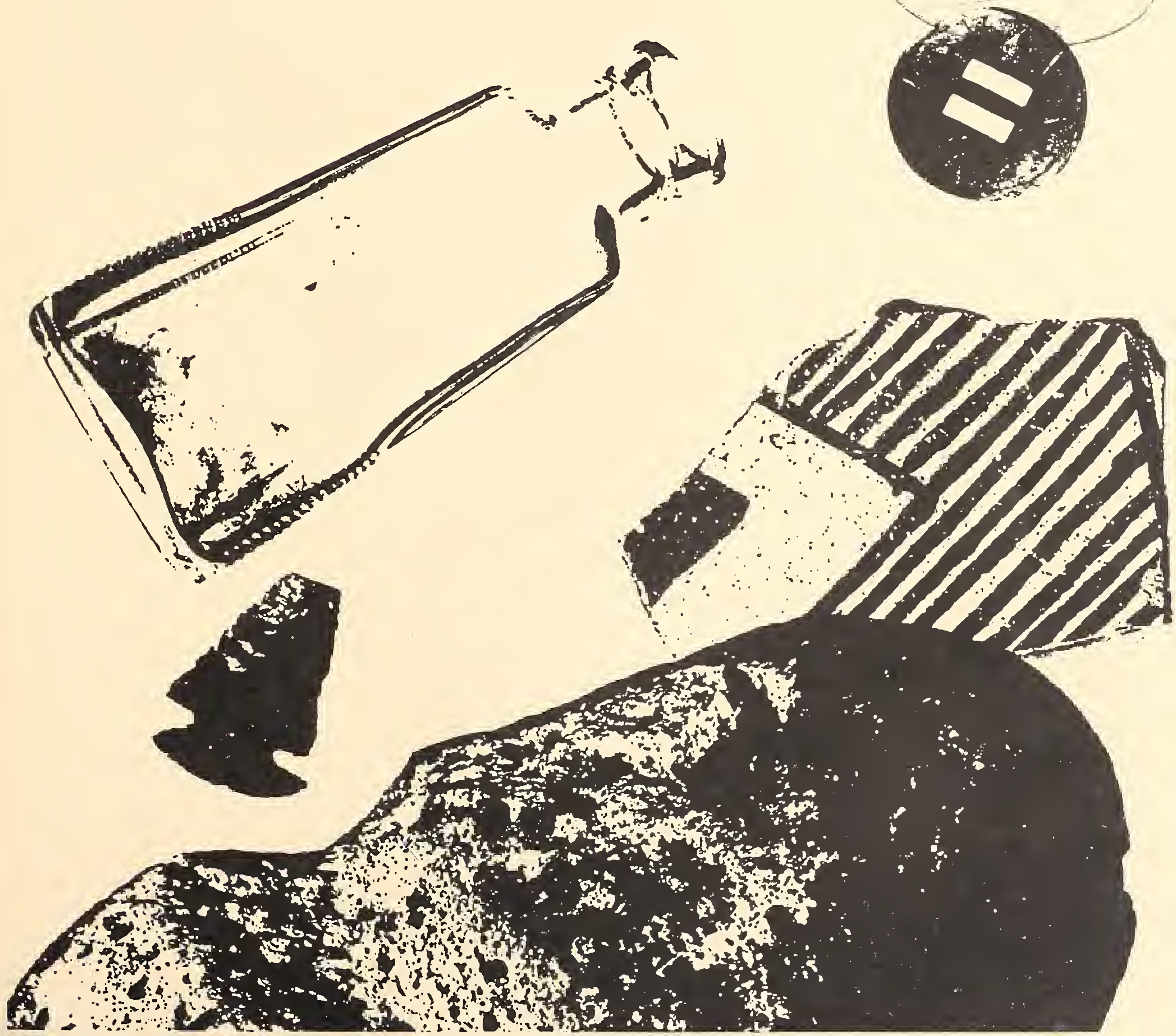
Report No. 16

Heritage Resources Management

Archeology of the Farmington Sector of the Elena Gallegos Project



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Archeology of the Farmington Sector of the Elena Gallegos Project

Edited By
Joseph A. Tainter

Heritage Resources Management
Report No. 16

USDA Forest Service
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Chapter 1 • Introduction

Joseph A. Tainter

Introduction

The Elena Gallegos Land Exchange began in 1981. Its purpose was to acquire the major portion of the eastern part of the Elena Gallegos Grant, then owned by the Albuquerque Academy, for inclusion in the Sandia Mountain Wilderness near Albuquerque, New Mexico. The need to obtain the Grant for public ownership had been discussed in Albuquerque for several years. Without public ownership the land would probably have been subdivided, leaving a medley of houses and roads projecting into the Wilderness. Recognizing the problem, Congress authorized the Forest Service to acquire the Grant, but provided no funds for purchase.

An alternative way to acquire the Grant was to exchange it for Federal lands. Disposal of Federal lands requires compliance with the National Historic Preservation Act of 1966 and 36 CFR 800. When the land exchange was decided upon the Elena Gallegos Cultural Resources Project was born.

The original intention was to trade Federal lands directly for the Grant. The lands to be traded were mainly under the jurisdiction of the Bureau of Land Management, and so it was that a Forest Service archeological project came to be done on BLM lands. When the BLM lands proved unacceptable to the Trustees of the Albuquerque Academy a more circuitous method was found. The city of Albuquerque purchased most of the Grant outright (which required an increase in the city's sales tax), leaving the Academy with a low-elevation parcel which it uses for outdoor education. The city retained another low-elevation parcel for itself, and traded the higher-elevation land to the Forest Service. Thus the city of Albuquerque came to own much of the land on which the Elena Gallegos Cultural Resources Project was done.

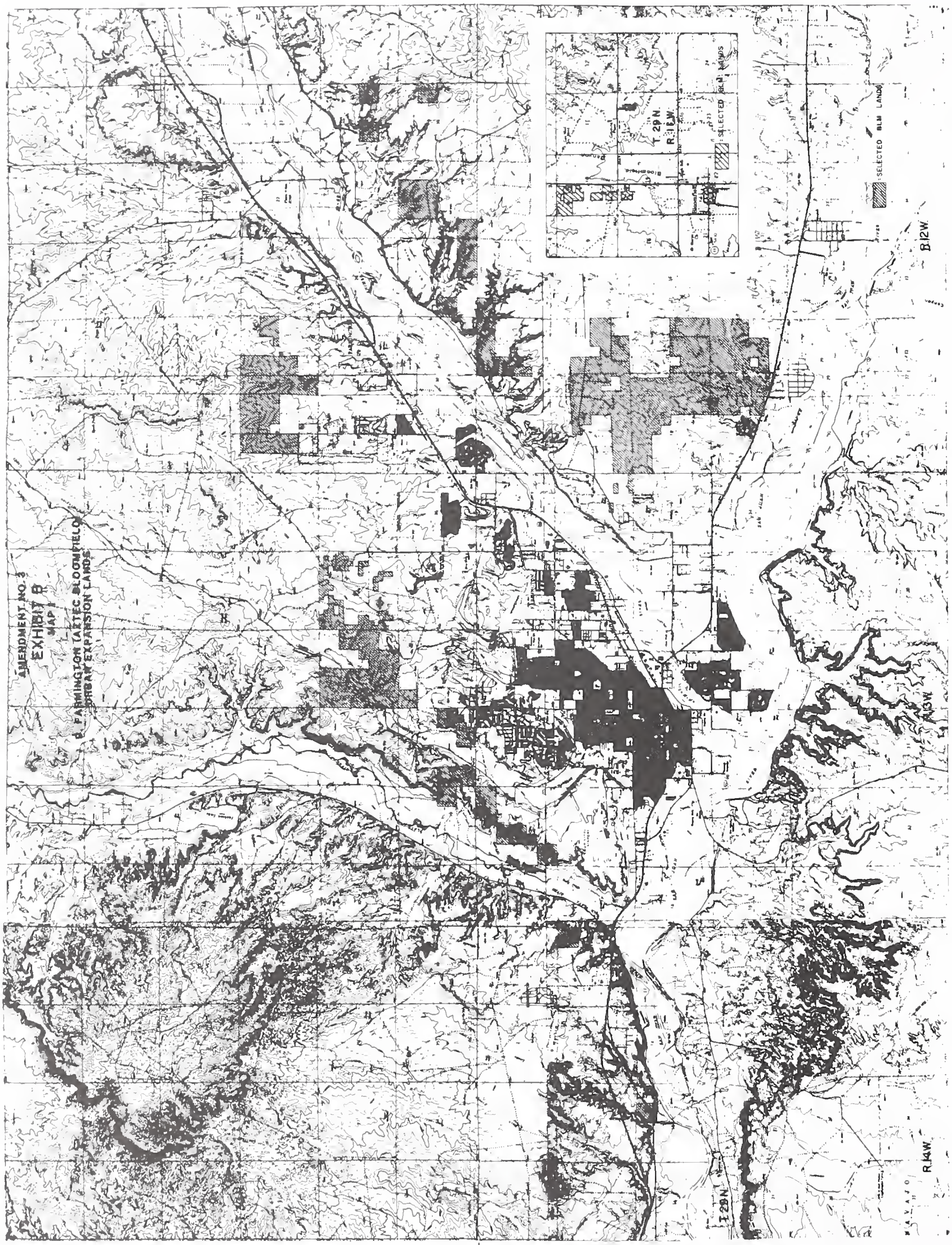
The Elena Gallegos Land Exchange is the largest archeological project that the Forest Service has undertaken. It involved survey of 32,823 acres, on which 537 sites and many more isolated artifacts were found. Of these sites, 71 were archeologically tested and 10 were fully excavated.

The number of sites tested and excavated might seem low relative to the number found. This is because a good part of the survey was on lands that, for one reason or another, were eventually dropped from the exchange. No sites were excavated on these lands. Furthermore, some lands with high densities of sites were traded to the city of Albuquerque without Forest Service excavation, but with the provision that the city would protect the sites and would undertake excavation before disposing of the land. This arrangement was acceptable to the State Historic Preservation Officer, and the city is presently fulfilling its obligations under the agreement.

The BLM lands selected for exchange clustered in three areas: around Las Cruces in southern New Mexico, around Albuquerque in the central part of the state, and around Farmington in the northwest. The reports of the archeological surveys are on file in the Laboratory of Anthropology, Museum of New Mexico, Santa Fe. The present document is a report on the testing and excavation conducted around Farmington. Separate volumes have been prepared for the Las Cruces and Albuquerque sections. In the Farmington area Forest Service crews, and crews under contract from the Museum of Northern Arizona (MNA), surveyed 4336.58 acres, found 50 sites and 158 isolated artifacts, tested 27 sites, and excavated 4. The Farmington project area is shown in Map 1-1.

The land exchange required several lines of environmental assessment, involving such fields as geology, paleontology, watershed, wildlife, soils, grazing, and of course archeology. The cultural resources portion began in June 1981, when Dee Green, David Gillio, and I were informed of the project and of the urgent need for archeological work. The three of us began immediately to plan for this work. Forest Service survey crews were in the field within two weeks, and newly-hired crews shortly thereafter. Dee Green served as Project Director, and as Principal Investigator for the Farmington area, from June 1981 to September 1983. I assumed those responsibilities in October 1983, when the project was transferred from the Southwestern Regional Office to the Cibola National Forest.

The survey phase in Farmington was conducted in stages, during August, November, and December 1981, and in April 1982. Forest Service crews were supervised in the field by Peter Pilles and Fred Plog. Crews from the Museum of Northern Arizona were supervised by Steven Dosh, Cheryl Taylor, and Don Keller. Keller served as MNA survey director. Forest Service crew members were Richard Newton, Belinda McFerrin, Katherine Miles, Showell Osborne, Mark Sale, and Trace Stuart. The MNA crew members were Skip Willes, Jenny Miller, Dotty Spaulding, Karen Doerr, Ricardo Unwin, David Millinan, Mike Miklochik, James Marrone, and John Day. Michael Elliott of the Forest Service conducted additional survey in April 1982. The testing phase extended from December 1981 to May 1982; all testing was done by Forest Service crews. The testing was supervised by Michael Elliott and Charles Haecker, and the crew members were Robert Lawrence, Cheryl Muceus, Dave Staley, Bert Starr, Robert Dickerson, Pete Fieweger, Peter Morse, Wayne Oakes, Keith Oshins, and David Hutchinson. The excavation phase in the Farmington area began in July 1982 and ended in December of that year. This work was also done by Forest Service crews, who were supervised by Carol Raish and James Rancier. The excavation crew members were Stephen Fischer, Bruce



Map 1-1. The Farmington Project Areas.

Freyburger, Richard Sullivan, Sandra Marshall, Steven Street, and Louanna Haecker.

After the end of fieldwork, laboratory analysis, computer analysis, and report preparation continued until late 1990. The laboratory crew consisted, at various times, of Gail Bailey, Jeff Boyer, James Brandi, Karen Diver, Stephen Fischer, Louanna Haecker, Mary Keith, David Legare, Gail McPherson, Carol Raish, Jeanne Schutt, Steven Street, Laurel Wallace, and Helene Warren. Carol Raish capably supervised this work at times when I was assigned to other projects. Other persons who assisted with laboratory work and records management were Roy Becenti, Traci Bendaw, Polly Davis, Gabe Griego, Ruth Gotay, Linda Hall, Lois Klinsing, Wayne Jaekel, Diane Perea, Janet Sanchez, and Helene White. Shirley Waters typed the many volumes of field notes and field forms. Robert McMahon prepared the photographs. The computer data entry, a massive job, was done by Kent Hoke, Carmen Chavira, Andrew Todachene, and Marilyn Vigil. The computer analyses were done by David Legare and James Snyder, both of whom wrote many custom programs for the project and worked out the many problems that inevitably arise in very large data bases. Lela Bridge, Michael Johnson, Doreen Moya, Jane Murray, Louis Redmond, Wini Rutherford, Elaine Sigler, Norma Senn, Viola Swenson, and Laurel Wallace helped with some of the myriad tasks needed to prepare a report of this size. Nora Altamirano, Roberta Montoya, and Carmen Gallegos of the Rocky Mountain Research Station assisted in preparing the report for final publication. Sandra Roberts of the Southwestern Regional Office ably supervised formatting and publication efforts.

Research Goals

One of the most persistent complaints about archeology done within cultural resource management is that it often has no guiding research objectives. The Farmington segment of the Elena Gallegos project, ironically, had an embarrassment of riches in this regard. Fully three research designs were developed for this area, and each guided at least part of the work. Michael Elliott developed the first research design, which was for the testing phase. Project Director Dee Green then wrote another research design to guide the excavation phase. Implementation of this research design was accepted by the State Historic Preservation Officer and the Advisory Council on Historic Preservation as adequate to mitigate the effect of the project on the sites in question. Later, when the fieldwork was completed, Carol Raish developed a third research design, for reasons which will be discussed below. Elliott's, Green's, and Raish's research designs are all included in this volume, and so I will summarize them only briefly here.

The three research designs dealt with land-use patterns in the study area, and in this regard there is continuity among them. Elliott concentrated on Puebloan use of hinterlands - areas away from the main riverine settlements - for wild foods and raw materials. He believed that the following research topics would prove informative regarding land use: (1) reconstructing past environments; (2) chronological placement of sites; (3) the formation processes of each site; and (4) differences between Archaic and Anasazi lithic assemblages.

Dee Green's research design took a very different approach. Following the work of David Stuart (Stuart and Gauthier 1981), Green postulated that the project area would have been used by two kinds of people: (1) nonsedentary people practicing a foraging economy - an "efficient" adaptation, in Stuart's terminology; and (2) people following a "power" adaptation (<u>sensu</u> Stuart) who used the area in an exploitative or high-consumptive mode. Green predicted that there would have been radical differences in the use of resources by such peoples, and in the archeological remains they left behind. These ideas guided the excavation of FA 1-6, 2-13, 3-3, and 3-6.

Raish felt that this research design needed to be revised subsequent to the fieldwork. She argued that there were two reasons for this. Firstly, the research design pertained primarily to the Puebloan era, while much of the excavated material was from the Basketmaker II to III time periods. Secondly, there appeared to be conceptual problems in the mitigation phase research design which made it impossible to implement. One of these is a problem of perspective. In the Power/Efficiency model, Puebloans are considered to be powerful groups, and foragers to be efficient. Yet compared to an industrial society, <u>both</u> Puebloans <u>and</u> foragers appear efficient. Furthermore it is possible, perhaps even common, for groups to alternate between powerful and efficient states, as circumstances dictate. Finally, it was not possible to recognize the archeological identification criteria for powerful or efficient groups in the features and artifacts available for study. Some of these criteria may not really identify the presence of one type of people or the other.

Raish's revised research design continued the emphasis on land-use patterns. She based her design on Upham's "adaptive diversity" (1984) framework. The notion of adaptive diversity postulates that prehistoric Southwestern populations shifted, as necessary, between intensive (Puebloan) and extensive (forager) patterns of land use. This idea, if substantiated, would require a substantial reassessment of aspects of Southwestern prehistory. The common wisdom developed from decades of Southwestern archeology is that native peoples underwent a linear evolution from mobile foragers to sedentary pithouse-dwellers, to builders of small pueblos; and finally became builders of the large pueblos in which they were found at contact. Although environmental conditions caused some areas to be abandoned from time to time, this did not deflect the evolutionary pattern. An adaptive diversity framework postulates that prehistoric Southwesterners actually underwent periods of developing complexity punctuated by episodes of sociopolitical collapse. What appears to be a record of unbroken evolution is actually an artifact of biased sampling: archeologists have tended to excavate the larger sites and to study the more strongly-patterned artifact distributions.

The excavation of four sites cannot, of course, establish whether Farmington-area prehistory was characterized by linear evolution or adaptive diversity. What it can do is contribute toward the eventual resolution of this matter. At this point it is important to report the Farmington results in such a way that the question of adaptive diversity can ultimately be addressed. Accordingly, Raish specified that the following kinds of information would be sought.

1. Chronological information regarding the use of cultigens.

2. The kinds of cultigens and wild plants used, and their archeological contexts.

3. Kinds of storage facilities and the plant remains associated with these.

4. Chronological information regarding storage facilities.

5. The location of sites in regard to arable land and water.

6. Site seasonality.

In summary, the research designs for the Farmington area evolved from an initial concern with how Puebloans used hinterland areas; to a suggestion that the area was used by two peoples with very different adaptive strategies; to the possibility that local societies may have oscillated between simple and complex states.

As matters turned out, after an absence of several years from the project, Carol Raish returned to write the final synthesis of the Farmington project area. It is included here as Chapter 21. Raish has prepared an excellent synthesis, including an assessment of the revised research design, evaluations of various models of Farmington-area land use, and placement of the Elena Gallegos sites within regional systems of subsistence and settlement. Her chapter is a major contribution to our understanding both of Farmington prehistory, and of broader processes of adaptive diversity in the northern Southwest.

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1981. Prehistoric New Mexico: Background for Survey. New Mexico Historic Preservation Bureau, Santa Fe.

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1984. Adaptive Diversity and Southwestern Abandonment. Journal of Anthropological Research 40: 235-256.

Chapter 2 • Research Framework: Testing

Michael L. Elliott

Introduction

Lands considered for exchange for the Elena Gallegos Land Grant included 6238.59 acres of public land near Farmington, New Mexico (Map 1-1). The process of obtaining cultural resources clearance to proceed with the exchange of these parcels necessitated several stages of archeological fieldwork, laboratory analysis, and research. Since these lands were being considered for exchange, i.e., removal from public domain, it was necessary to develop an archeological testing program to determine if any of the cultural resources on the exchange lands were eligible for nomination to the National Register of Historic Places. In that event, the land containing those sites would have to be deleted from the exchange, or a mitigation plan would have to be developed. The clearance unit was designated as the cadastral survey section. In other words, all lands and cultural resources within a section were considered together before clearance reports or recommendations were made.

The Research Program

The first element in developing the research program was a literature and records search. This involved a search of records at the Laboratory of Anthropology, Bureau of Land Management (BLM), and various archeological contracting organizations, to determine the nature and extent of previous archeological work in the study area. In addition, published and unpublished references and reports from a variety of sources were examined.

The second stage of the research program was to survey all the lands proposed for the exchange. The purpose of the survey was to locate, record, and photograph all cultural resources within the study area dating prior to A.D. 1950. This arbitrary cutoff date was decided at an early stage of the project in consultation with the BLM staff.

After the survey was completed a stage of evaluation was required. A plan for testing sites which had the potential for meeting criteria for nomination to the National Register was developed, based on analysis and evaluation of the survey data. Initially, it was planned to test only a sample of sites, but since we began to find certain discrepancies in the survey data, it was decided to revisit each site, collect additional data, and conduct some subsurface investigations.

Once the testing phase had been completed, another stage of evaluation became necessary. At this point, based on the analysis of some data recovered from the survey and the test excavations, it was decided which sites still were likely to meet the National Register criteria. These would require a complete mitigation program.

The mitigation of the adverse effects of the exchange upon National Register-eligible sites then became the final stage of the field work. Upon completion of that work the data analysis and report writing will complete the project.

Previous Archeological Research in the Study Area

In general, there has been little intensive archeological investigation in the immediate study area north of the San Juan River and between the La Plata and Animas Rivers (excluding the Bloomfield parcels, in which we found no prehistoric components). Most of the work done has been small clearance surveys for pipelines, powerlines, well pads, and roads. In the regional sense, however, the San Juan Basin has been the target of a great number of large and small archeological projects for a hundred years or so. Since this area is the heartland of the San Juan Anasazi, and thousands of Anasazi sites are present, including some of the most impressive and well preserved pre-Columbian sites in America, many of the archeological investigations prior to 1960 were directed towards understanding the Anasazi occupation.

Beginning in the 1960s, however, and corresponding to the paradigmatic shift among scientific archeological researchers, emphasis began to change. This was accelerated by the beginning of public or federal archeology programs. Recent work in the San Juan Basin, by and large, has been problem-oriented, even when directed towards Anasazi sites. All sites are usually recorded during the course of archeological surveys, and evaluated in light of the recognition that human systems consist of interrelated parts, hence small sites may yield important information for the study of prehistoric peoples.

As a result of this shift in research orientation and the initiation of public/federal archeology programs, an information explosion has occurred. A huge data base exists, but it is fragmented and difficult to synthesize, since so much of it is unpublished.

The ruins of the San Juan Basin began attracting the attention of the first Anglo-American parties to visit the area. In 1849 Lieutenant Simpson of the U.S. Army Corps of Topographical Engineers visited and named, while accompanied by a Navajo guide, many of the major ruins in Chaco Canyon (1849). In 1859, a Captain J. N. Macomb, of the same unit, mentioned observing numerous ruins and other cultural remains along the San Juan, Animas, and La Plata Rivers (1876:108-109).

A Lieutenant Birnie of the Wheeler Survey party visited the area in 1874 and noted extensive ruins along the Animas River (1879:347-350). W. H. Holmes visited the San Juan area in 1875 and 1876 and also noted large ruins along the La Plata River (1878). Lewis Henry Morgan visited the La Plata and Animas drainages to view the large ruins there, as part of his research in Indian house form and structure (1881:187-188). Warren K. Moorehead visited Aztec Ruins in 1892, along with other large ruins in the vicinity (1908). Mitchel Prudden described Salmon Ruin and several small sites nearby (1903).

The common theme in most of these early explorations was simply the joy and wonder of discovery. These reports reflect no systematic investigation. In the U.S. Army reports the ruins are reported only peripherally since the main thrust of those expeditions was exploration of land.

Evidently, the early Anglo-American inhabitants of the San Juan area were avid pothunters, and probably destroyed large areas of most of the larger sites. Earl Morris, the figure most closely associated with early archeological investigations in the area, got his first interest in archeology through such casual pothunting (Lister and Lister 1968).

Morris' first systematic archeological work in the area was his La Plata survey. In all, some eight field seasons were spent in the survey and subsequent excavations for this project. In addition, Morris was responsible for most of the excavations and reconstruction at Aztec Ruins.

From the period of 1930-1955 there were few archeological projects conducted in the area, outside of Chaco Canyon, which continued to be the subject of intensive investigations. In 1956, the San Juan Pipeline Project (Wendorf 1956) was conducted. This was the first "salvage" project in the immediate San Juan area. Both survey and site excavation in the pipeline right of way were undertaken.

Subsequent to the San Juan Pipeline project, numerous clearance type investigations associated with mineral exploitation, and large scale research projects have taken place. Table 2-1 lists the largest of these projects.

Overview of Prehistory of the Area

Southwestern prehistory is generally divided into several broad temporal periods. The earliest of these, the PaleoIndian period, represents the earliest human adaptation in the Americas. This period is generally thought to date from ca. 13,000 to ca. 7,000 years B.P. in the Southwest. The PaleoIndian adaptation is thought to have been oriented to the hunting of extinct species of megafauna. The proportion of the PaleoIndian diet derived from plants may have been higher than many believe. In the absence of any data to test such propositions the issue will remain in the realm of speculation. Most PeleoIndian sites are characterized by the presence of well-made projectile points and other stone tools, sometimes in association with megafaunal remains. Such sites are often located near extinct playas, at least in central New Mexico (Judge 1973).

PaleoIndian remains have rarely been reported in the San Juan Basin; those that have been are primarily isolated projectile points, or are mixed with late materials (Kirkpatrick 1980). This dearth of reported PaleoIndian materials may relate as much to the low visibility of such sites, alluviation, and masking by later components as it does to levels of PaleoIndian utilization in this area. The nearest PaleoIndian remains to the study are those reported by Hadlock (1962) in the Gallegos Wash area.

The next broad temporal period in the Southwest is generally referred to as the Archaic. Human adaptations of this period are usually conceived of as broad-spectrum hunting and gathering. Small groups of highly mobile people exploited differentially available plant, animal, and other resources over a wide area, probably as seasonally available.

The most common interpretative framework applied to Archaic remains in the San Juan Basin is that found in the Oshara Tradition (1973) of Cynthia Irwin-Williams. Based on survey and excavations done in the Arroyo Cuervo area of New Mexico, immediately east of the San Juan Basin, she developed a chronological scheme of six phases, each with associated cultural remains. Very often, this chronology is used unquestioningly to interpret all probable Archaic remains in the San Juan Basin. Since so little of the supportive data have been pub-

Table 2-1. Recent, Major Archeological Projects in the San Juan Basin.

Project	Reference
CGP	Reher 1977
VII	Moore and Winter 1981
Chaco	Hayes, Brugge, & Judge 1981
NIIP	Kirkpatrick 1980
Star Lake-Bisti	Huse, Noisal, & Halasi 1978
EPCC	Sessions et al. 1979
Salmon	Irwin-Williams 1982

lished, including the radiocarbon dates, it is difficult to assess the Oshara Tradition model even with relation to the Arroyo Cuervo area, much less Northwestern New Mexico. Nevertheless, a discussion of the Oshara chronology is included here for comparative purposes.

The earliest phase in the Oshara sequence is the Jay Phase (ca. 5500-4800 B.C.), though some would label it as an essentially PaleoIndian adaptive system. In the Arroyo Cuervo Region, Jay sites were most often found in sheet sand deposits at canyon heads on the cliff tops or near intermittent ponds and at the base of the low mesa. No groundstone was found.

The Bajada Phase (ca. 4800-2300 B.C.) comes next. This phase is usually divided into early and late periods. Site locations were similar to those of the Jay phase. In the Arroyo Cuervo area, site frequency increases during this phase. Some take this to mean an increasing population, but I regard that as unproven.

The San Jose Phase (ca. 3000-1800 B.C.) sites are generally located at canyon heads or rims and in canyon bottoms near springs. Site size showed a marked increase during this period, as did frequency of hearths. Projectile points were often serrated on the edges. Groundstone implements first appeared during this phase.

The Armijo Phase (ca. 1800-800 B.C.) marked the initial appearance of corn into the subsistence mix. Site locations were similar to the San Jose Phase, but rock shelters were also used. Groundstone tools were found more frequently at sites of this phase.

The En Medio (ca. 800 B.C.-A.D. 400) and Trujillo (ca. A.D. 400-600) phases are often considered together as they represent what was known as the Basketmaker II and early Basketmaker III periods. Storage cysts were often present in the rock shelters, as were fairly well-developed middens. In the Trujillo Phase, bows and arrows, and Lino-affinis grayware ceramics made their appearance. Chipped stone tools other than projectile points and utilized flakes are at sites of this period with groundstone being the most common tool type.

I believe the basic utility of the Oshara model is as a heuristic device. In many respects, it functions much like the Pecos Chronology for the sedentary periods. In other words, the phase names can be used to indicate a given time period which everyone understands, but with the recognition that considerable variability may exist from one locale to another.

The next broad time period is usually referred to as Basketmaker or Formative, and is usually dated from ca. 500 B.C. to A.D. 700. Many important changes in social structure, demography, subsistence base, and settlement pattern occurred during this period. Food storage facilities, recognizable structures for habitation, the bow and arrow, ceramics, population increase and aggregation, and increased dependence upon maize horticulture were all attributes of this period.

In the study area, Earl Morris' work along the La Plata (1939) and at several early Basketmaker sites near Durango, Colorado (1949) provided a great deal of information about the Basketmaker adaptation, including some very early tree-ring dates, indicating occupation in the first three centuries B.C. (Dean 1975). Another important source of data for the study area is the publications for the Navajo Reservoir archeological investigations (Eddy 1966).

Basketmaker remains in the immediate project area are essentially unknown. I can find no published reference to such materials. The subsequent Puebloan period is very well documented. The best known period of Puebloan occupation in the study area is the Pueblo II and Pueblo III periods. During this time a number of large pueblos were constructed and occupied. In the study area, most of these sites are near the major drainages of the area, the San Juan, Animas, and La Plata Rivers. The study area represents a contact zone between the Chacoan and Mesa Verdean occupations in the San Juan Basin. Salmon Ruin, on the San Juan River, contains occupations reflecting both traditions.

The study area was not intensively occupied by the Anasazi after about A.D. 1300, so far as is known. The San Juan Basin Regional Uranium Study Site File lists only 37 Pueblo IV components from its more than 8000 sites (Stuart and Gauthier 1981:66).

The exact entry dates of Athabaskan (Navajo and Apache) and Numic (Utes) speaking peoples into the study area are unknown. It seems unlikely that they were in the San Juan Basin much before A.D. 1550 (MacGregor 1965).

Environmental Setting

The project area encompasses portions of Hood Mesa and Crouch Mesa near Farmington, and isolated parcels near Kirtland and Bloomfield, New Mexico. This area is drained by three permanent drainages, the San Juan, Animas, and La Plata Rivers. The region is best characterized geologically by sedimentary sandstone of the Ojo Alamo Formation and shales of the Kirtland and Fruitland Formations (Dane and Bachman 1965). Elevation of the exchange parcels varies from about 5200 to 5900 feet. Vegetation is primarily related to nearness to water. The higher, dry dissected mesas are characterized by juniper associations and some pinyon. The riverine areas have dense riparian associations.

Several isolated semistabilized sand dunes occur in the study area, and appear to be highly correlated with the presence of cultural materials. These dunes most often occur on the margins above shallow washes.

Temperatures in the study area vary from extremes of -20 degrees to 110 degrees Fahrenheit, with means of from 35.6 degrees to 68.6 degrees Fahrenheit. The coldest month is December, with an average low of 16.5 degrees and an average high of 44.8 degrees Fahrenheit. The hottest month is July, with an average low of 57.2 degrees and average high of 92.7 degrees Fahrenheit (Kirkpatrick 1980).

The average precipitation at Fruitland is 6.96 inches per year (Houghton 1973). Farmington receives an average of 8.4 inches per year (Tuan 1969).

The Survey

The purpose of the survey was to locate, record, and photograph all cultural resources in the exchange lands. All sites located were recorded on USDA Forest Service forms. Isolated occurrences were recorded on Bureau of Land Management forms. Several individuals and organizations were involved in the archeological surveys. Peter Pilles of the Coconino National Forest directed crews in the survey of 1230 acres during August 1981. Fred Plog of New Mexico State University supervised the survey of 135 acres near Bloomfield during the same period. In November and December 1981 Dan Keller of the Museum of Northern Arizona supervised three crews from that institution in the survey of some 5000 acres. A crew under my direction surveyed some 20 acres near Bloomfield in April 1982.

Similar methods were employed in each of these surveys. The land was traversed by each crew while walking linear transects, generally oriented to a cardinal direction. The transect interval varied from 10 to 25 meters, depending upon surface visibility and topography. When sites or isolated finds were located, the crews stopped to record each locus. The forms were filled out, sketch maps drawn, and photographs taken. Grab samples were made of artifacts which might be useful for dating or evaluating the sites or finds. Each site was then flagged with flagging tape. An aluminum tag with the site number embossed on it was attached to a nearby tree or bush and the sites was flagged. The definition of site used was "any concentration of five artifacts or features within 10 square meters or less." Other artifacts or features were recorded as isolated occurrences. Some isolated artifacts with no temporally diagnostic or interpretive value were not recorded. These would most often be small tin cans, bottles, sherds, or flakes of undeterminate age and not associated with any other interpretable remains. Most parcels within the study area have a low density of artifacts: less than one per 100 square meters.

The Cultural Resources

Forty-nine archeological sites were recorded in these surveys, and 158 isolated occurrences. Field site numbers consisted of a two letter locational code, an optional crew nunmber, and a sequential site number. The sequential site number started over with each area and crew. The Laboratory of Anthropology assigned numbers to all but two sites, Numbers Masonic I and Bloomfield V. Isolated finds were numbered in the same manner but with "IF" preceding the sequential number.

The sites can be characterized as follows:

- 12 aceramic flake or flake and ground stone scatters;
- 10 flake or flake and ground stone scatters with ceramics;
- 23 historic, most of which were 20th century trash dumps;
- 2 rock art sites;
- 1 small pueblo; and
- 1 historic structure and associated trash which had a prehistoric lithic component.

Because of survey boundary changes, inaccurate map reading, and other survey anomalies, seven sites recorded during the course of the survey(s) were later found to lie outside the final boundaries of the exchange parcels. These sites are numbers LA-33738, 33742, 33751, 33754, 33755, 33761, and the site designated Masonic I which was not assigned an LA number. The ownership status of the land upon which these sites are located is not entirely clear. It appears in most cases that the ownership is private. However, due to the small size of many of these parcels and the lack of survey markers, it is not possible to be certain, except that the sites are not within the final exchange parcel boundaries.

The final tally of sites which were tested is as follows:

- 16 flake or flake and groundstone scatters;
- 10 flake or flake and groundstone scatters with ceramics;
- 14 historic;

1 rock art;

1 rock art with a lithic and ceramic scatter; and

1 historic structure with a prehistoric lithic component.

Since this document is concerned only with the prehistoric components, we have 28 components to deal with. Many of these components have features other than the portable artifacts, of course. Most have at least one hearth, one has a possible structure (LA 33750), and one has an apparent storage cyst or bin facility (LA 33724). The historic sites are described by Haecker (this volume).

The Testing Program

Removal of these sites from the public domain via the exchange of the land would constitute an adverse effect upon the resources. A testing program was devised to assist in the evaluation of the affected resources. The purpose of the testing program was really threefold. The first was to recover sufficient data to enable the resource managers to evaluate each site's potential National Register eligibility. The second was to examine each site from a research perspective relevant to current archeological and anthropological theory. The third purpose was to pose research questions and recover classes of data suitable for answering such questions.

Clearance needs and research needs are not necessarily the same thing, and, in fact, usually are not. Professional archeologists have an obligation to wear both hats, as it were; to be a researcher, and yet keep in mind that the ultimate goal is to provide data and recommendations to the resource manager to allow intelligent decisions to be made regarding the allocation of cultural resources. The testing program outlined here is a fair compromise between these sometimes conflicting obligations.

Theoretical Perspective

Archeological theory is a set of assumptions and general propositions which are used to explain the archeological record and predict cultural phenomena. Theory provides the means for relating the preserved material remains of past human activity to the behavior that produced them. Theory exists at several conceptual levels. At its highest level, theory is the unified set of assumptions, relationships, and propositions which most of the profession agree to be true. This level is often called a paradigm. Middle range theory is a more specific body of assumptions, relationships, and propositions which provide a means for relating archeological data to the real world.

At any level, though, theory is formulated in a similar manner. Assumptions are made explicit, a series of relationships between various phenomena are proposed, and methods for testing the propositions outlined.

Now, obviously, this is an oversimplification of an exceedingly complex process. However, I do not feel that we must reinvent the wheel (or restate the epistemological foundations of archeological theory) each time we do research. I do intend to make my assumptions explicit, posit a series of testable propositions, and propose data recovery methods to provide a means for testing said propositions.

The Archaic period is assumed here to represent a broad-spectrum hunting and gathering adaptive system. A wide range of plant and animal resources was exploited. Several internal self-regulating mechanisms were operative.

The basic human group was the nuclear family. Descent was bilateral, and married couples could live with parents or relatives of either spouse. Group membership beyond the nuclear family was very flexible. Cliques, or groups of two or more nuclear or extended families, kin-related or non-kin, were formed to exploit dispersed resources, when availability permitted this size. The band, or group of nuclear families organized toward the acquisition of critical resources of a certain area, probably seldom coalesced into a single residential unit, or camp, at least in the San Juan Basin. At certain times of the year, when food and water were ubiquitious, this larger grouping was viable. When critical resources were more dispersed, smaller units, cliques, or nuclear or extended families, were the exploitative units.

Relationships between bands were probably maintained over a large area through communication or trade networks. Individual member of bands, or families, could change their band membership easily. In fact, most families probably had kin, trade, or communication links with many other groups outside their band. These extra-local relationships provided a buffering mechanism in times of local subsistence stress. In this manner, the band could disperse to whatever density the environment would support.

Territoriality is not seen here to represent a valid concept for this model, at least in the sense of a bounded space defended by its occupants against encroachment. Given the homogeneity of Archaic cultural materials and similar chronology over much of the San Juan Basin, little supportive evidence for territories can be seen. Variability in site location, size and artifact assemblages is seen here as primarily functional, and related to variations in topography, plant and animal communities, climate, and water. Large Archaic "sites" are probably composite concentrations of artifacts and features that represent seasonal reuse of favored locations for hundreds or thousands of years. Small Archaic sites represent less favored locales which may have been used once or a few times. In one sense, these small sites represent adaptive experiments, for this type of system would be dynamic, and would constantly be exploring alternative avenues of resource exploitation.

The introduction of cultigens, initially corn, into such a system probably caused little change at first. Corn would have been utilized much like any wild plant, that is, harvested seasonally and consumed within days of the harvest. Archaic hunters and gathers did not become agriculturalists simply because a cultigen was available. Instead, the incipient cultivation of corn probably offered some slight adaptive advantage to its practitioners. The hunting and gathering system began suffering some disequilibrium. Slight population increases may have severely limited many of the buffering options formerly available, such as population control, dispersal, or abandonment. With mobility thus circumscribed, adaptive advantage would accrue to those failed foragers who were planting, cultivating, and harvesting corn. The only thing separating this system of incipient agriculture from a predominantly agricultural adaptation was the development of food preservation technology and facilities (storage). The first storage facilities were probably natural niches in local rock outcrops. Corn or even wild foods could have been cached in such features and used later.

The construction of permanent habitation structures (pithouses), and pottery, linked the Basketmaker to the Puebloan system. It is argued here that early Basketmakers were still quite mobile, though they probably covered much less area than the hunters and gatherers. Permanent habitations occurred as a response to the need to protect crops and facilitate intensified agricultural productive techniques such as pot (or basket) irrigation, weeding, or fertilization. This is seen here to represent a predominately Puebloan or semi-sedentary trait. Pottery was first more of a portable, airtight storage facility. Whether the "idea" of pottery was transmitted from Mexico or Southern New Mexico, or was independently invented, is irrelevant. It was adapted into the Basketmaker system because it provided a more efficient and less "expensive" (in terms of labor) alternative to storage cysts or bins. I believe that most non-industrial adaptive systems seek out efficiency, and continually experiment with alternative methods of task performance until perceived efficiency is achieved. I differ from the ideas expressed as the Principle of Least Cost, or Minimax strategy, in that I do not believe that the least-cost strategy is always discovered, or that it is always acceptable socially. If the minimax strategy were a truss, adaptive systems would seldom fail or change.

Demographic changes resulted from this change in adaptive systems. Population increases occurred more as a result of decreased mobility and food surpluses than vice-versa. Population remained fairly stable for much of the Archaic period, perhaps increasing slowly throughout the period. I do not believe that population during the Archaic period even approached the carrying capacity of the San Juan Basin. Nor do I believe that environmental change or deterioration caused an adaptive change. In my view, the hunter-gatherer system was flexible enough to adapt to environmental cycles. I do not feel it necessary to invoke population or environment as prime movers of cultural change. They are but elements in a complex multivariate set of conditions which confronted hunters and gatherers in the San Juan Basin. Their response to environmental shifts and increased population (intensified agriculture, storage facilities, permanent habitations, pottery) evolved only after many alternatives had been examined, applied, and rejected.

Once semi-sedentism had emerged, many of the population controls practiced by hunters and gatherers became unnecessary. Slightly better nutrition and increased body fat by itself could have increased fertility. Non-ambulatory members of the social group (small children, diseased, aged) no longer were quite the liability they would have been in the hunting-gathering system.

What emerged, then, in the San Juan Basin, during the Formative period, was a semi-sedentary, though still fairly mobile composite adaptation with certain aspects of both hunter-gatherer and horticulturalist systems. Pithouses were probably occupied only part of the year or by only part of the inhabitants, with the balance of the time spent hunting and harvesting wild plants.

Individual residential mobility must have decreased with the proliferation of nonportable property, and the energy "expense" of constructing storage and habitation facilities. However, we sometimes tend to sterotype individual behavior and fail to consider the role of the individual in shaping societies. No two individuals are the same, or react in exactly the same way to similar stimuli.

For example, we often ignore the fact that specialization of labor can and often does occur in egalitarian societies, and may not be accompanied by a concomitant differential in status. Certain individuals are better farmers than others, others better hunters, still others expert craftsmen. In other cases, mere preference and not skill may dictate a choice of "career." The point is that not every person who lived in a pueblo was a farmer. Certain individuals or groups who by birth or marriage had residential rights and facilities within the pueblo may have preferred or been skilled at hunting of game, and pursued this the great majority of the time. In such cases, the individual would spend as much or more time away from the pueblo or village as he did in it, returning periodically to exchange meat with village farmers or craftsmen for other necessities. He is still a Puebloan, but he is creating sites in contexts more akin to hunter-gatherer systems.

What I am implying is that Puebloan peoples like the Anasazi continued to utilize the surrounding hinterlands for a variety of needs, and there may have been individuals engaged in such non-agricultural related activities most of their time. It is not entirely clear what resources would have been extracted from the hinterlands by the Anasazi, since their needs would differ greatly from Archaic hunter-gatherers, or Basketmakers. However, it would seem reasonable to assume that at least the following resources were being extracted; wood for fuel and architectural uses; bark, yucca and grasses for weaving, basketry, cordage, and sandals; a variety of plants used for food, medicine, religious ceremonies, and fabric dying; small to large game such as mice and other rodents, lizards, snakes, birds, toads, frogs, fish, rabbits, antelope, deer, elk, bear, and perhaps even predators like coyotes and wolves for food, hide, fur, containers, ceremonial uses, and bone for tools; lithic, clay, or building material quarries for tools, ceramic, or construction uses; and "summer vacations," the chance to get away from the hot, crowded, dry, or malodorous pueblo for a while. In addition, certain favorable areas could have been used as "truck gardens" to provide additional sources of food to the pueblo. This may have been a buffering mechanism in that by planting crops in a variety of soils and environmental contexts, one is more likely to recover a good harvest, when considering the extreme variability of the weather in the San Juan Basin.

The model of Anasazi land use I am attempting to explicate has at its base the assumption that varied and numerous important activities occurred away from the pueblo itself and its farmlands. Very little research has been directed towards understanding such activities and the sites they generate. Given the kinds of sites located during the survey, it would appear that a number of them would be suitable for research in this area.

Research Objectives

I have defined the following as research objectives or goals for the testing phase of the project.

1. Obtain data relevant to reconstruction of past environmental conditions in the study area. Since many of the prehistoric sites appear to be resource extraction loci, it is important to attempt to determine which economically valuable resources could have been utilized.

2. Obtain as much chronometric data as possible to facilitate refinement of local chronology, which is poorly understood, particularly for pre-Anasazi periods in the immediate study area.

3. Study the formative process at each site, with particular attention to the manner in which geologic and cultural forces have affected the surface distribution of cultural materials.

4. Test the proposition that Archaic and Anasazi ceramic sites can be differentiated by comparisons of lithic assemblage variability (material type, morphology, use-wear).

These goals are reasonable, in that one might expect to recover data suitable for attaining them. More elaborate or complicated research objectives might be unattainable due to the limitations of the data, or time and money necessary to analyze them. I believe these goals will provide useful information to the professional archeological community, and that they represent concerns of current interest.

The methods and results of the testing program are described by Bertram (this volume).

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Chapter 3 • Research Framework: Excavation

Dee F. Green

Introduction

The Southwestern Region of the Forest Service has developed a set of regional research topics meant to guide the conduct of research on prehistoric cultural resources (Green and Plog 1983). One of these topics is the investigation of complex settlement systems. Under the auspices of the State Historic Preservation Office the State of New Mexico has addressed the issue of statewide research needs (Stuart and Gauthier 1981). One of the ideas developed by Stuart is a power and efficiency model. These two ideas have been combined as the focus for the research framework on the Farmington sites.

Tainter (1982) has made the point that mitigation situations do not necessarily allow for the collection of all the data necessary to solve a regionally-oriented research question. However, sites excavated under the constraints of a mitigation situation can still contribute toward the solution of a problem. This framework has been designed with the above points in mind. We further note that the Farmington sites scheduled for excavation do not constitute a known representative sample of any cultural phenomena and that they may be limited in time to ceramic-producing periods. They also represent periodic use of the area rather than permanent settlement even though there are permanent villages in the vicinity.

Data Base

Six sites were originally scheduled for mitigation in the Farmington area. [Editor's Note: the lands containing two of these sites were later withdrawn from the exchange, and so the sites were not excavated.] All but one (FA 2-16) appeared on the surface as open sherd and lithic scatters probably dating to between A.D. 900-1150 in a pinyon-juniper environment. Site FA 2-16 is a small rock shelter located below a cliff face along an intermittent wash. Again, with the exception of Site FA2-16, site locations are on upper terraces of the San Juan drainage which are now eroding. Four of the sites are located between the Animas and La Plata rivers, both tributaries of the San Juan and in close proximity to the modern town of Farmington, New Mexico. The settlement characteristics of the area include numerous other sites of a similar type in the same setting along with permanent villages at lower elevations along the rivers. A major Chacoan outlier site, the Salmon Ruin, lies a few miles upstream between Farmington and Bloomfield. Lithic resources in the area include extensive river cobble deposits with a high quartzite content.

Complex Settlement Systems

The study of complex settlement systems requires an understanding not only of the towns which form the central places of such systems but of the hinterland support locations as well (Cordell, Schiffer, and Upham 1983). The central importance of the Chaco towns in the San Juan Basin is well established (Cordell and Plog 1978; Judge 1979; Schelberg 1980) as is the outlier system of villages (Judge 1979; Marshall, Stein, Loose, and Novotny 1979). These villages were in turn tied to other smaller settlements which then presumably exploited surrounding environments for resources which were used both locally and passed through a trade network maintained between the various villages and towns. It does not follow, however, that hinterland resource utilization was the sole prerogative of peoples tied to the Chacoan system. Stuart (Stuart and Gauthier 1981:22-24) has argued that there may have been a persistence of peoples with a hunting/gathering lifestyle in the midst of settled agriculturists. Such nomads might remain "in the Cracks around aggregated communities" (Stuart and Gauthier 1981:38) where they would have available for use the same set of resources available to sedentists who would also engage in hunting/gathering activity. The nomads could also be expected to trade or borrow (steal) resources produced by sedentists. Thus both groups would have similar resources available although probably in differing quantities. How they would make use of these resources can be modeled using Stuart's power-efficiency idea.

Power and Efficiency

Stuart (Stuart and Gauthier 1981:16-24) discussed power and efficiency primarily in terms of population control. However, he has developed (personal communication) the model to include resource utilization as a component. His argument is essentially that nomads use the environment in efficient (conservative) ways whereas sedentists who are on a "power drive" exploit the resource base. That is, they extract energy in greater quantities than absolutely necessary for day-to-day survival. Nomads can neither store nor transport goods in the same quantities as do sedentists. Nomads undoubtedly had social networks which resulted in trade, including trade with sedentists. However, it is doubtful that these networks had the capability of absorbing resources in the quantities available through sedentist's trading networks. Sedentists had storage capacity unavailable to foragers which allowed them to keep goods and filter them into the trade network in order to prevent saturation of the network and/or take advantage of better trading conditions at a later time.

What Stuart postulates is two evolutionary trajectories existing side by side in time, each occupying essentially different space on the landscape except for certain areas which are utilized by both peoples. The nomadic cultural system is tied to a wandering lifestyle which utilizes the available resource base in an efficient manner and the sedentist cultural system is tied to a settled lifestyle which exploits the resource base to derive maximum energy output. The term efficient in this context refers to decisions about how the resource base is used and not to techniques for extracting resources. Both groups would tend to extract resources in an efficient manner although for different reasons.

Research Problem

Accepting the assumptions of Stuart's power/efficiency idea, we propose a problem orientation which suggests that between about A.D. 900 and 1150 in the upper bench country about the San Juan drainage, resource utilization was conducted by two groups of prehistoric peoples having different cultural systems. One system was characterized by an economy devoted to foraging with a nomadic lifestyle. The folk in this system were on the landscape in question only periodically and may have returned to the same location or general area only on a seasonal basis. There may have been up to several years gap in their use of the area. The goods which they transported into or from the area were limited, and they tended to restrict the volume of resources consumed while in the area. These are the "efficiency" people who use the environment in a low-consumptive or conservative mode compared to the other folk. The second system was characterized by a diversified economy encompassing agriculture, foraging, and trade, accompanied by a sedentary lifestyle. The folk in this system were on the landscape in question only periodically but returned to the same location or general area frequently. The goods they transported into or from the area were much greater in volume and there were few to no restrictions on the volume of resources consumed. These are the "power" people who used the environment in an exploitative or high-consumptive mode compared to the efficiency folk. The sites to be mitigated in the Farmington area should reflect use by one or both of these groups.

Test Implications

Suggesting that different cultural systems may have utilized resources on the same landscape, one ought to be able to define how those differences should be reflected in the material remains. Although both groups are presumed to have been engaged in foraging, there should be differences in the archeological records left by either group. Based on the set of assumptions made above, the following test implications have been derived to suggest how the cultural difference postulated might be reflected in the archeological record.

Food Plants: Power group, these folk would tend to gather all of the usable (ripe, readily dug) plant remains available. If more were gathered than could be transported in a single trip to their village, a guard could be set and a return trip made the following day. They might also gather only enough for a single load but later return to the area in order to acquire everything available. Anything usable and not taken would be seen as waste and economic loss. A single household which could not gather all usable materials would report the surplus to a nearby household.

Efficiency group, these folk would tend to gather only that portion of the usable (ripe, readily dug) plant remains available which they could consume within a day or two. If more were available than could be consumed or transported it would be left ungathered. In addition, they would select from those foods which they most preferred (tasted best, easiest to harvest) ignoring other available resources. A decision to move to a new location would be made without necessarily exhausting the available food and this would not be seen as either wasteful or an economic loss. Reporting unused food in an area to another nomadic group would occur only if another group happened to be encountered. Gathering surpluses to trade with sedentists would not be profitable since the same food resources are easily gatherable by them. Trading food would more likely occur by nomads bringing in exotic items not readily available to the sedentists. Therefore, archeological localities where plant food remains are preserved (hearths, dry caves) would reflect power group use if the remains occur in relatively more abundance and greater variety. Exotic occurrences, low relative volume, and low relative variety would reflect efficiency users.

Other Plant Remains: Plants gathered for tools or activities such as dying, painting, medicinal, or other uses are not apt to be preserved in the Farmington sites except possibly in the small rock shelter (FA 2-16) or occasionally as items in a firepit. We have not taken the trouble to develop the specific rationale for every plant use which might be recovered. We only state that as a general rule they should follow that proposed for plant food remains. That is, the power folk would use more and a greater variety, the efficiency folk less, with a limited variety and include exotic items. Some items such as pottery paint and cloth dying materials may be exclusive with the power folk.

Animal Remains: Uses for both food and tools are considered together. Power group, as with plants, this group would kill and remove more game. Larger animals such as deer could be transported entirely although they might be skinned and butchered prior to transportation. Rodents, rabbits, and birds might either be eaten in the gathering area or transported. If eaten, then usable bone would be transported back to the village.

Efficiency group, taking either large or small game would leave remains in the area since only those bones (and antlers) needed to replace broken tools would be transported away. These folk would also tend to utilize a greater variety of game resources.

Therefore, archeological localities where animal food remains are preserved (hearths, dry caves) would reflect efficiency group use if the remains occur in relatively more abundance and variety or exotic species occur. Low relative volume and lesser variety would reflect power users.

Ceramics: Power group, these folk produce ceramics either directly or are closely tied to people who do. They have them in abundance and would transport quantities to foraging locations. When breakage occurred, they would transport larger and/or selected pieces back to the village for reuse. A greater variety of ceramics would be available and whole pots would occasionally be left on site since later retrieval would be relatively easy.

Efficiency group, these folk would make only limited use of pottery tending toward that already on site and they would not tend to transport either broken or whole pieces.

Therefore, archeological localities where ceramics are preserved would reflect power group use if the ceramic remains were relatively abundant, showed greater variety within the same time period, had smaller sherds and less complete pots. Low relative volume, low relative variety, larger sherds, and more complete pots would reflect efficiency users.

Manos and Metates: Power group, these folk manufacture metates and manos and would transport them to the foraging area where the metates would be left and the manos transported back and forth, depending on size.

Efficiency group, these folk manufacture bedrock mortars but would use metates available on site. They would have less of a tendency to transport manos than the power group but some small one-handed types might be carried.

Therefore archeological localities where manos and metates are preserved would show no measurable difference between groups.

Chipped Stone Tools: Power group, these folk manufacture foraging tools on site from local raw materials for use at the site. Complex tools (those that show multiple use or wear patterns on the same piece of stone) would be relatively less abundant than single purpose tools. No significant transportation of tools from the site would occur although raw material would be returned to the village. New tool manufacture rather than repair would be more common. Quality of manufacture would be relatively less sophisticated and less well executed.

Efficiency group, these folk manufacture foraging tools both on and off the site from local and exotic raw materials. Complex tools would be relatively more abundant than single purpose tools. Tools would be transported off site and exotic material tools which needed repair would be repaired and transported away. Quality of manufacture would be relatively more sophisticated as well as executed.

Therefore, archeological localities where chipped stone tools are preserved would reflect an efficiency group if exotic tools or waste flakes were present, there are relatively more complex tools, and the quality of manufacture was relatively better. Exclusive local raw material use, relatively more abundant single purpose tools, and relatively poorer quality of manufacture would reflect power users.

Stone Axes and Mauls: Power group, these folk manufacture these tools and use them in wood gathering for both firewood and construction. They would be transported back to the village from a foraging location and would only occur in the localities under investigation if broken or lost.

Efficiency group, these folk neither manufacture nor use stone axes and mauls. Their construction and fuelwood needs do not require large trees to be taken. This would not preclude their using such a tool if found in a foraging area, but they would be unlikely to transport it away unless the intent was to trade it specifically and immediately to a power group.

Therefore, archeological localities where stone axes and mauls are preserved would reflect power group use. Failure to find such tools is <u>not</u> a reflection of efficiency group use since the power group would not tend to leave such artifacts in the foraging area anyway.

Fuelwood: Power group, these folks would tend to use either very small pinyon or any size juniper wood for fuel in the foraging area. Larger pinyon would be transported back to the village since its characteristics make it a preferred fuel over juniper. The latter, on the other hand, would be preferred for construction materials. In order to transport logs, however, they need to be limbed and the resultant fuel could both be used on site or transported. During the early period of the power drive, pinyon may have been conserved because it also produces a food crop. Later however, as fuel becomes scarcer, there would be more of a tendancy to use pinyon including the taking of the whole tree rather than just limbs.

Efficiency group, these folk would utilize pinyon almost exclusively. It is easier to gather, ignites more quickly, and produces more heat than juniper. Since no transportation of fuel would be involved except in the immediate area, no large trees nor large limbs would need to be taken. Quantities of large dead and down material would only be available prior to the time when the power drive folk began consuming large quantities of fuelwood.

Therefore, archeological localities where fuelwood is preserved (hearths) would reflect power group use if juniper or large specimens were a component of the use. If only small pinyon is found either group could be responsible.

Exotic Remains: By this term we mean any plant, animal, or lithic remains which would not occur naturally in the immediate environment. Power group, generally speaking this group will have access to and have acquired more exotic materials than the efficiency group. However, most of the exotics will remain at the village locations and not be transported to the foraging stations. Exotic items such as axes, which may be carried to foraging stations, would be returned to the village.

Efficiency group, this group will transport exotic items to foraging stations but will also transport them away unless they become broken or were transported for specific use at that station with the intention of abandonment.

Therefore, archeological localities where exotic items occur would reflect efficiency group use unless such an item could be shown to be exclusive to the power group. Lack of exotic items would not be an argument for either side since both are likely to remove such items from foraging stations.

Data Requirements

The following field and analytical techniques will be employed in an effort to acquire the kinds of data which will have the highest probability of contributing information useful in addressing the research question. No single date set will in and of itself confirm the notion that two different cultural groups were foraging from the same resource base at the same time. In fact it is likely that the data taken together will not confirm this notion but only result in a better idea about how to tackle the problem elsewhere. Nevertheless the effort is work taking.

Field Requirements: Special care will be taken with the hearths. Data collection will include not only carbon-fourteen (C-14) samples and floatation, but charcoal which can be recovered in pieces useful for species identification. Hearths will be sectioned and the microstratigraphy examined to see if multiple burning events can be defined. If so, their contents will be recovered separately. Close attention will be paid to horizontal distributions of artifacts and features, since the analytical units of importance are activity loci and not sites. Standard horizontal and vertical control will be maintained with attention to natural stratigraphy, where it can be defined. Artifacts will be point plotted.

Analysis Requirements: Standard pollen, C-14, and floatation analyses will be undertaken, as well as plant species identification of charcoal from hearths. Archeomagnetic samples, if available, will be taken and submitted for dating. Ceramics will be analysed in terms of number of vessels present and estimates made of the amount of the vessel remaining. Ceramics will be used for relative dating of sites when other more accurate methods are not available. Lithic materials will be examined for types and sources of stone as well as workmanship and use. Multiple- and single-use tools will be distinguished. Both plant and exotic lithic remains will be identified.

Summary

A research strategy has been designed which will address the notion that both nomadic and sedentary peoples were conducting foraging activities at the same time and in the same place. An attempt will be made to separate these activity loci on the basis of the material remains recovered and analysed. We anticipate that this attempt will fail either because there will not be sufficient data available in the archeological record or because in fact the area was only used by sedentists. In order to confirm the two-group notion, there must be a preponderance of evidence pointing to different groups co-using an area. We are not suggesting that Stuart's model is wrong, but only that the landscape we are investigating may not have been a "crack."

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Chapter 4 • Research Frameworks Assessment

Carol Raish

Introduction

Research frameworks for the Farmington area of the Elena Gallegos Land Exchange Project were developed for the testing (Elliott, this volume) and excavation (Green, this volume) phases of the project. Since the goals and orientations of these frameworks differ in their interpretations of Anasazi land use, a reassessment of the research orientation of the project for the Farmington area is necessary. This paper briefly reviews the previous research frameworks and sets forth a revised and expanded set of research goals.

The research framework for the testing phase presents a model of land use that views the study area as a resource extraction locus through time. During Anasazi times, the area is seen as a resource area for larger pueblos in the region with the assumption that "varied and numerous important activities occurred <u>away</u> from the Pueblo itself and its farmlands" (Elliott, this volume). In conjunction with this model of land use, Elliott developed research goals for testing that were primarily oriented to the recovery of basic environmental, taphonomic, and chronological information to ascertain the time periods of use and the resources potentially available during these time periods. These goals can be summarized as follows:

1. Recovery of information pertinent to the reconstruction of past environmental conditions and information concerning which economically valuable resources were present in the area.

2. Recovery of chronometric data to facilitate refinement of local chronology, especially for pre-Anasazi periods.

3. Recovery of information allowing for the study of formation processes at each site, with particular attention to the manner in which geological and cultural forces have affected the surface distribution of cultural materials.

4. Recovery of information to test the proposition that Archaic and Anasazi aceramic sites can be differentiated by comparisons of lithic assemblage variability (material type, morphology, use-wear) (Elliott, this volume).

In addition to determining which sites needed additional data recovery to meet legal requirements, the testing program did, in most cases, recover the kinds of information discussed in goals one through three, and the kind of information needed to test the proposition set forth in goal four concerning the differentiation of Archaic and Anasazi aceramic sites on the basis of lithic assemblage variability. This last is a topic of considerable research interest in Southwestern prehistory and will be discussed further at a later point in this assessment.

After completion of the testing phase of the project, sites were selected for excavation primarily on the basis of their potential eligibility for the National Register of Historic Places. Six sites were selected for further excavation (Elliott, this volume). Due to the fact that some lands were subsequently removed from consideration for exchange, four sites were eventually excavated in the Farmington area.

Prior to beginning the excavation phase of the project, a research framework specific to that phase was developed (Green, this volume). This framework was oriented primarily to the recovery of information concerning the Anasazi occupation of the area, with the major time period of interest being ca. A.D. 900-1150. Our concern with this narrow time span was conditioned not only by research interests, but also by the view, which later proved incorrect during excavation, that the majority of sites to be excavated probably fell within that time span. For this time period the major topic of interest was the investigation of complex settlement systems.

In this view the study area could not be assumed to represent solely a hinterland, foraging locus, or the limited-activity sites of larger pueblos in the region during Anasazi times, as envisioned by Elliott (this volume). The possibility that forager groups were present in the area at the same time as the sedentists from the larger pueblos also needed to be considered. Consequently, Green proposed a research problem to examine this possibility in terms of Stuart's Power and Efficiency model, adapting this model to describe the interaction between agricultural sedentists and nomadic foragers using parts of the same territory simultaneously (Stuart and Gauthier 1981: 16-24; Green, this volume). Specifically, the goal of excavations in the study area was to recover information that would allow differentiation between special-use or limited-activity sites produced by sedentists resident at larger pueblos in the area, and those produced by foragers occasionally using the same area. This research problem will be discussed in detail in the Anasazi section of this assessment.

During the course of excavations in the Farmington area and examination of the information recovered from the survey and testing phases of the project, it became apparent that the original testing and excavation research frameworks were at variance with each other, and were insufficient to address the full temporal range of cultural resources present within the project area. Consequently, the following revised and expanded series of research questions was developed during the excavation and analysis phases of the project.

Research Frameworks Assessment: Basketmaker II and III (Late Archaic/ Early Anasazi)

Preliminary studies indicate that BMII and BMIII sites (variously dated from ca. 800 B.C. to A.D. 600 [En Medio and Trujillo phases] [Irwin-Williams 1973], ca. 500 B.C. to A.D. 750 [Reher 1977:30], or ca. 200 B.C. to A.D. 700 [Berry 1982:90]) are present in the general area. Both prior research in the area (Elliott, this volume), however, and work conducted during this project indicate that the heaviest Anasazi use of the project area occurred during the later Puebloan time periods. Prior to the present research, Basketmaker remains were essentially unknown from the area, while Pueblo II and Pueblo III were well documented (Elliott, this volume). Due to the frequency of Pueblo II and III remains, our major Anasazi research emphasis will be on these later periods.

The Basketmaker II and III time periods are critical to understanding the prehistory of the area, as they constitute the transition from Late Archaic to early Anasazi (Irwin-Williams 1973). Sites of this era have the potential for shedding light on a variety of important research questions, including the growing dependence on domestic crops.

Since not enough is known about this time frame in the project area, our research will focus on obtaining the basic descriptive information discussed by Elliott (this volume). In addition, the sites will be examined in terms of their potential contribution to increasing our understanding of the role of domestic crops during the BMII-BMIII period. Specifically, the following information will be sought during the analysis:

1. Chronological information that is definitely associated with cultigens.
2. Kinds of cultigens present along with their association with wild plant resources and their context of preservation.
3. Kinds of storage facilities present and the nature of the plant remains associated with these facilities.
4. Chronological information that is associated with the storage facilities.
5. Location of the site with respect to arable land and water.
6. Seasonality of the site.

Emphasis in analysis has been placed on chronometric, botanical, and faunal samples from tested and excavated sites to facilitate recovery of the desired information.

With these data, we will focus on examining the chronological placement and subsistence economy of project area sites. As stated previously, the use of domestic crops in the subsistence economy is of primary interest. The dates when cultigens occur, their kind, and their quantity (when realistically determinable), are questions of particular interest. Since a growing use of storage facilities is often correlated with a growing dependence on cultigens, the presence, quantity, and contents of storage facilities will also be monitored. This type of information will allow us to develop a greater understanding of the subsistence economy of the project area sites, especially with respect to the appearance and role of domestic crops.

We will additionally examine the possible economic relationships of the project sites, located in the bench country of the San Juan River, to other sites in the general Farmington vicinity. We are particularly interested in determining if the project area sites represent year-round occupation or if they seem to represent seasonal occupation by groups resident at lower elevations. This kind of knowledge will help us to understand the level of sedentism in the vicinity during the time period, with consequent implications for the economy of the area as a whole. Thus, we will move beyond the immediate project area to contribute to understanding the economy of the Farmington vicinity as a whole during the BMII-BMIII period.

Research Frameworks Assessment: Pueblo I-Pueblo III

It is with the Puebloan time periods that the excavation research framework becomes pertinent. This is also the time period that shows the densest Anasazi occupation of the immediate project area and is the period of our most intense research effort.

Puebloan remains in the study area are typically considered to be associated with the larger pueblos in the vicinity, and to represent small special activity loci probably related to the occupations at those sites (Elliott, this volume). Green, however, rejects this assumption and proposes a research framework suggested by a model of adaptive diversity (to be discussed in detail in a later section of this study). This research framework examines the possibility that both sedentists from nearby pueblos and foragers might have shared the same area, at least occasionally, and produced the sites under study.

The examination of the dynamics of interaction between foragers and sedentists, or nomads and farmers, is a topic of prime interest not only in the Southwest but in other areas as well (Lattimore 1962; Cordell 1982: 59-83; Upham 1982, 1984; Cordell, Schiffer, and Upham 1983: 9-27; Dennel 1985: 113-139; Moore 1985: 93-111; Tainter 1985; Green n.d.). Obviously, to examine the possible interactions between two such groups their presence in an area must be determined and the sites they produce identified. Thus, identification criteria must be developed to allow recognition of sites produced by nomads in contrast to those produced by sedentists. In the Southwest this is especially critical with respect to the small sites that are often considered to be Puebloan limited-activity or special-use sites. The ability to distinguish between sites produced by hunter-gatherers, and those produced by sedentists obtaining wild resources, would allow a much clearer understanding of land-use patterns and subsistence strategies during later Puebloan times. In addition, it would give a much clearer understanding of the potential for interaction among different groups present in the region. Understanding the role of these small Anasazi period sites is crucial to our understanding of the prehistory of the area.

The research framework attempts the difficult task of developing means of distinguishing which groups might have produced these small sites. As discussed briefly above (INTRODUCTION), the concepts of Power and Efficiency, as discussed by Stuart, are used to model a landscape that contains two cultural groups at different economic and organizational levels (Stuart and Gauthier 1981: 16-24; Green, this volume). One group consists of foragers or nomads using the area on a seasonal or sporadic basis. The other group consists of sedentists resident within the vicinity and using the area as a wild resource procurement locus. The foragers are characterized as an Efficiency group and the sedentists as a Power group. The argument is as follows:

> Stuart (1981:16-24) discusses power and efficiency primarily in terms of population control. However, he has developed (personal communication) the model to include resource utilization as a component. His argument is essentially that nomads use the environment in an efficient (conservative) way whereas sedentists who are on a "power drive" exploit the resource base. That is, they extract energy in greater quantities than absolutely necessary for day to day survival. Nomads can neither store nor transport goods in the same quantities as do sedentists. Nomads undoubtedly had social networks which resulted in trade including trade with sedentists. However, it is doubtful that these networks had the capability of absorbing resources in the quantities available through sedentist's trading networks. Sedentists had storage capacity unavailable to foragers which allowed them to keep goods and filter them into the trade network in order to prevent saturation of the network and/or take advantage of better trading conditions at a later time.
>
> What Stuart postulates is two evolutionary trajectories existing side by side in time each occupying essentially different space on the landscape except for certain areas which are utilized by both peoples. The nomadic cultural system is tied to a wandering lifestyle which utilizes the available resource base in an efficient manner and the sedentist cultural system is tied to a settled lifestyle which exploits the resource base to derive maximum energy output....
>
> Accepting the assumptions of Stuart's power/efficiency idea, we propose a problem orientation which suggests that between about A.D. 900 and 1150 in the upper bench country near the San Juan drainage, resource utilization was foraging conducted by two groups of prehistoric peoples having different cultural systems. One system was characterized by an economy devoted to foraging with a nomadic lifestyle. The folk in this system were in the location or general area only on a seasonal basis. There may have been up to several years gap in their use of the area. The goods which they transported into or from the area were limited and they tended to restrict the volume of resources consumed while in the area. These are the "efficiency" people who use the environment in a low consumptive or conservative mode compared to the other folk. The second system was characterized by a diversified economy encompassing agriculture, foraging and trade accompanied by a sedentary lifestyle. The folk in this system were on the landscape in question only periodically but returned to the same location or general area frequently. The goods they transported into or from the area were much greater in volume and there were few to no restrictions on the volume of resources consumed. These are the "power" people who used the environment in an exploitative or high consumptive mode compared to the efficiency folk. The six sites to be mitigated in the Farmington area should reflect use by one or both of these groups (Green, this volume).

Thus, the ideas of Power and Efficiency are used to infer resource utilization behaviors for the proposed nomadic and sedentary groups. From these behaviors a set of identification criteria are developed to be sought in the archeological remains as a means of recognizing whether the sites were produced by nomads or sedentists. In essence, the research questions attempt to determine if the presence of both groups can be identified in the area. The following paragraphs will assess the utility of the original research framework.

To understand the supporting model of the research design, some discussion of the concepts of power and efficiency is necessary. Stuart considers Power and Efficiency as a general conceptual framework for a model of divergent evolution. He feels that cultural evolution operates to create the divergence of the powerful and the efficient, and that this separation of the powerful from the efficient is the fundamental process of evolution (1981: 12).

Cultural systems are on a power drive when they increase rates of population growth, rates of production, or rates of energy expenditure (Stuart and Gauthier 1981: 10-12). They are in disequilibrium. Large, complex, agriculturally-based societies are described as examples of powerful systems. They are characterized by intensive use of the landscape, high rates of population production, high labor investments, and increasing size and complexity over time.

Hunter-gatherer systems, in contrast, are efficient systems with energy in and energy out more nearly equal, lower rates of population growth, lower production, and lower energy expenditure. These systems are characterized by extensive use of the landscape, very low labor investments, and relative stability in size and complexity over time (Stuart and Gauthier 1981: 10, 14).

As well as viewing systems in terms of being powerful or efficient, Stuart also states that systems oscillate between these two states (1981: 10). He argues that "... power favors short term competition while efficiency favors durability in evolutionary terms. The need of a system to be successful in both generates a <u>balancing act</u> between immediate and longer term risk...." (Stuart and Gauthier 1981: 12). Certain of Stuart's statements indicate that subsistence stress/environmental perturbations trigger an efficiency response in a group (a homeostatic hunter-gatherer group is used as the example). If the environment returns to normal, a demographic power drive to reestablish the old homeostasis will be induced (1981: 12-13). Thus, it seems there are both powerful and efficient systems, and within these different types of systems there can be oscillating power and efficiency states.

Aside from confusion due to this somewhat ambiguous use of the terms Power and Efficiency (such that there is uncertainty as to whether a particular kind of group or a type of system state is being referred to), there is debate concerning the role of the model in explaining and/or describing the process of cultural evolution. Our primary concern, however, lies with using the model to classify systems, and with the behaviors that are developed from the model to describe powerful and efficient systems. The research design uses the Power and Efficiency model as a way to describe two different kinds of systems proposed to have been present in the study area during puebloan times, and thus focuses on that part of the construct that describes the two types of systems. Thus, our interest centers on the described behaviors of powerful and efficient systems, and on the identification criteria that are developed from those behaviors, and which are to be sought in the archeological record.

In the first place, the notion of what is a powerful system and what is an efficient one must be considered. The Anasazi pueblos are considered power groups in the model, but to us in a twentieth-century industrial society, the Anasazi appear to have been efficient. Thus, there is a problem of scale and perspective in using the model to classify systems as powerful or efficient, without being able to quantify, on an interval scale, exactly what those terms mean.

In addition, the concepts of Power and Efficiency are an oversimplification of the ways in which systems operate (Legare n.d.). Accommodating systems to a dichotomy masks the variability we seek to examine. Power and Efficiency should not be viewed strictly as forces in opposition. Efficiency can be viewed more productively as the result of the ratio of power output to power input (Odum and Pinkerton 1985; Kavanagh n.d.: 1). Consequently, powerful systems are not necessarily inefficient systems (Legare n.d.: 1-9), nor are all large, powerful systems on a power drive. Thus, power-drive behaviors such as those discussed in the research design should not automatically be attributed to a system simply because it appears to be large, sedentary, and agricultural. Conversely, and as discussed by Stuart (Stuart and Gauthier 1981: 14), small hunter-gatherer systems may also go on power drives, a process which would undoubtedly alter their efficient, conservative behavior. Hunter-gatherers, too, should not always be assumed to be efficient and conservative.

Even if we accept the assumption that powerful and efficient systems exist as characterized, there are additional conceptual difficulties with the specific behaviors of such systems. Neither these specific behaviors nor the test implications derived from them (to be discussed shortly) are warranted by ethnographic, ethnohistoric, or experimental studies. Would an agricultural group on a power drive, or an efficiency-state forager group, behave consistently in the ways described, and would those behaviors produce the defined test implications? No one can say for sure. No warranting arguments (Binford 1977: 1-10) are presented to link the behaviors to the original idea or to link the test implications to the behaviors. Consequently, even if remains like those predicted are indeed found, that still doesn't show that both powerful and efficient groups, representing sedentists and nomads, were present in the area, as opposed to some other kind(s) of groups. The archeological remains could have been produced by powerful or efficient groups, but they could just as easily have been produced by one group or by some other sort of group.

The major problem with the test implications, however, turned out to be operationalizing them. Archeological test implications are presented in the research design for various general artifact categories that are felt to be helpful in discerning the presence of powerful and efficient groups in the study area during puebloan times. These categories are the following: plant and animal remains, ceramics, groundstone, chipped stone, fuelwood, and exotic remains. The question addressed for each kind of remains is: what would this category look like archeologically if the site were produced by a Power group or by an Efficiency group? Unfortunately, during the field and analytical phases of the project, we found that we were unable to make the distinctions necessary to operationalize the test implications. In many cases, the predicted behaviors could have been produced by either powerful sedentary groups or efficient foragers, depending upon circumstances. Thus we could not use the original test implications to make the desired identifications.

To give some examples of this problem, the test implications concerning food remains are phrased in terms like "relatively more abundance" and "low relative volume." Such imprecise terms cannot be used as archeological test implications in this context. The test implication involving wood-type preferences is questionable, since one could argue that people camping in a hinterland would use whatever wood is dead, down, dry, and close. The majority of the test implications were similarly found to be wanting.

Understanding group interaction in the San Juan Basin during the later Anasazi time period remains a topic of considerable interest, however. We would like to know if sedentists from nearby pueblos were interacting with foragers making periodic visits to the area, and if it is possible to sort out their respective sites in the foraging area. Clarifying the role of small and limited-activity sites is, of course, crucial to resolving these concerns.

Actually, the Farmington data lend themselves well to addressing the sedentist/forager question. Consequently, several new research avenues will be used to explore this question to the extent that is realistically possible. In addition, this data set has the potential to contribute productive information on several other related areas of research interest. One of these concerns whether the sites in the area of study reflect trade and economic relationships with the region north of the San Juan River, with the Cibola area to the south, or with the Chuska area to the west, and whether a change in economic orientation is discernible through time.

Revised Research Framework

Adaptive Diversity

The central topic of interest remains understanding the role of small or limited-activity sites during Anasazi times, determining their functions, and attempting to ascertain whether they were produced by foragers or sedentists. This question, which motivated the research design, stems from a model of adaptive diversity that has been proposed by various Southwestern researchers (Cordell 1982: 59-83; Upham 1982, 1984; Cordell, Schiffer, and Upham 1983: 9-27; Tainter 1985; Green n.d.). This is the model we are interested in examining with the current research. This model is not only an alternative to the traditional view concerning Southwestern abandonments, but also treats the topic of the co-existence of sedentist and forager groups in the same vicinity during the same time period. In brief, the idea of adaptive diversity suggests that Puebloan abandonments represent "adaptive shifts to more areally extensive and efficient strategies" (Upham 1984: 250), as opposed to physical departure from an area. The shift to emphasis on a foraging strategy would give the appearance of abandonment since building episodes or occupations at major pueblos of the area would cease or be curtailed. Upham believes that such shifts were relatively common in the past. It also appears to him that "...different groups, some relying on strategies emphasizing sedentism and agriculture, some relying on mobility, and hunting and gathering, coexisted, perhaps symbiotically" (Upham 1984: 251). Thus, Upham sees an alternation of strategies from sedentism to foraging and back again, as well as co-existence of sedentary and forager groups in some areas during some time periods. To sum up his view: "During some periods (those characterized by major pueblos) relatively more hunter-gatherers were assimilated into a sedentary lifestyle; during others (those often characterized by abandonment), relatively more sedentary agriculturalists were forced into a pattern of hunting and gathering" (Upham 1984: 238).

If we wish to evaluate the adaptive diversity model, or examine our data in terms of the model, we must still devise means of differentiating those sites produced by sedentists while obtaining wild resources from those produced by non-sedentary groups. This question of identification remains our primary research focus. That this is an extremely difficult task can be seen from Green's original research design (this volume), as well as from discussions on the subject by both Upham (1984: 239-243) and Cordell (1982: 72-73). Various research strategies have been suggested to aid in attempting to make a distinction between these two kinds of sites. The importance of understanding the logistical requirements of sedentary systems versus those of hunter-gatherer systems has also been noted (Cordell, Schiffer, and Upham 1983: 12-18). Cordell (1982: 72-73), Upham (1984: 240), and Cordell, Schiffer, and Upham (1983: 10-24) discuss various potential, long-term, regional, and cross-cultural studies that might be implemented to help define the differences between forager-produced and sedentist-produced special-use sites. Several of these are not yet realistically possible due to a lack of pertinent data. Others are beyond the scope of this research. Consequently, this study will focus on several lines of information that seem realistic for the materials under study and the scope of the present project.

Research Questions

We will attack the proposed identification problem by attempting to understand both the hunter-gatherer and the sedentary, agricultural adaptations in the area. The types of sites these differing adaptations produced are of primary interest. We will identify the groups who produced the sites by means of multiple lines of evidence, whenever possible.

To meet these goals, we will begin by examining the recent research on hunter-gatherer societies within the general area, focusing particularly on current models describing subsistence organization (Reher 1977; Moore and Winter 1980; Hogan and Winter 1983). We are interested in determining if the hunter-gatherer groups appear to be following a forager or collector strategy (Binford 1980), or a "serial foraging" strategy as discussed by Elyea and Hogan (1983: 393-402). These different types of strategies, of course, condition the remains that appear in the archeological record. Understanding the nature of forager sites will help us to differentiate them from the logistical sites produced by sedentary groups.

We will examine similar information concerning the subsistence organization of agricultural Puebloan groups. In particular, we will follow Sebastian in her work in the NMAP (Navajo Mine Archeological Program) project area to the south of Farmington, and others who have made a beginning in examining those aspects of the Puebloan subsistence system that are especially pertinent to our research (Dean and Lindsay 1978: 109-117; Sebastian 1983: 409-419; Upham 1984: 239). Specifically, these authors have examined the role of wild resources and wild resource gathering loci in the Puebloan economy, and the placement of agricultural fields and fieldhouses. These topics are of considerable interest both for understanding Puebloan subsistence, and for the problem of specific identification of Puebloan logistical sites.

We will turn first to the research on Puebloan groups in developing the desired site identification criteria. Though these studies do not deal specifically with recognizing sites produced by hunter-gatherers versus those produced by sedentists, they do deal with distinguishing between two kinds of smaller or limited-activity sites that often appear as sherd and lithic scatters in the archeological record. These authors attempt to develop objective criteria for differentiating Anasazi fieldhouses from wild resource procurement locales using both ethnographic and archeological information. Since we assume that fieldhouses are the products of Puebloan agriculturalists, then reliably separating them from wild resource gathering locales not only informs us about the use of the area by the agriculturalists, but also is a step forward in understanding the role of the remaining sherd and lithic scatters that are not related to agricultural activity. To this end, the ethnographic studies concerning the role of wild resources in the Puebloan economy are also helpful in determining who created the remaining sites.

For example, Sebastian's ethnographic research was designed to determine under what circumstances, where, and when wild resources are gathered by Puebloan groups. (It should be borne in mind that historic period gathering practices may not be the same as pre-contact ones but, nonetheless, her research has some interesting implications for our study.) For instance, her review of the ethnographic information indicates that much, but of course not all, Puebloan gathering was done fairly close to home, with a return to the Pueblo during the same day. From her review of the information, she also feels that gathering was not of sufficient importance to have produced <u>all</u> (my emphasis) the sherd and lithic scatters classed as gathering camps in the archeological literature. From these lines of information, Sebastian concludes that archeological sites produced by Puebloan gathering activities would have a very low visibility and that many sherd and lithic scatters may be unrecognized fieldhouses (1983: 403-419). For our purposes, those that are not fieldhouses might just as easily be forager gathering camps as Puebloan camps. Sebastian's information strengthens the possibility that many of our sherd and lithic scatters may indeed have been produced by hunter-gatherer groups.

Thus, it will be profitable to separate potential fieldhouse sites from the remainder of the limited-activity sites. To accomplish this, we will use the identification criteria developed by Sebastian (1983: 408-412). These criteria will be discussed in considerably greater detail in the ceramic analysis section (Chapter 19). Briefly, she developed site categories (from her work with the NMAP sites) that would be discernible from survey data and would eventually allow recognition of probable fieldhouse sites that had no structural remains visible during survey. These categories were based on the presence or absence of structures and the nature of the ceramic assemblage with respect to the ratio of jars and utility wares to other ceramics. They were later expanded by examining information from excavated sites which allowed the use of additional functional information.

Sites will also be examined in terms of some of the more traditional means of distinguishing fieldhouses, such as data on habitation and storage structures, proximity to arable land, season of occupation, presence of cultigens, and presence of tools that might be related to agriculture. Fieldhouse sites will be identified using this information.

However, due to the upland location of the Farmington sites, we anticipate that many of these sites were indeed wild resource procurement locales that presumably will not fit the criteria used to define fieldhouse sites. These sites, then, offer the challenge of attempting to determine if they were produced by sedentary or nomadic groups.

To this end, several lines of inquiry will be pursued. These consist of information concerning site chronology, location, ceramics, and lithics. The first topic we will examine is the chronological placement of each site, whenever possible, in order to determine if the relevant small sites fall within the occupational range of the major pueblos in the area, such as Salmon and Aztec. Small, Anasazi-era sites that do not fall within the occupation span of area pueblos are of particular interest, as they might represent sites produced by non-Puebloan groups using the area on a sporadic basis.

The proximity of small sites to larger pueblos will also be noted. We will examine site locations in comparison to the relationship of recent Puebloan gathering sites to the home pueblo or fieldhouse (Sebastian 1983: 404-405). According to Sebastian's information, many Puebloan gathering sites would be ephemeral, day-use sites that are close to the pueblo and have low archeological visibility. They would not show indications of long-term occupation. Based on Sebastian's information, Eschman has argued that sites in close proximity to pueblos that show evidence of longer-term occupation were produced by non-Puebloan groups. He bases this argument on the assumption that Puebloan groups would not set up camp sites so close to home (Eschmann 1983: 384). According to this line of reasoning, then, more distant sites with evidence of longer-term occupation could have been produced by either Puebloan or non-Puebloan groups. Thus, we are interested in determining the length of site occupation, as well as site location and chronological position with respect to pueblos of the area.

Another line of inquiry concerns the pottery present on the small ceramic sites. Though pots do not equal people, groups that interact closely often share pottery styles and techniques. Following this principle, we are interested in determining if types and ware categories on the small sites are the same as those at the larger pueblos. Similar ceramics could indicate that the sites were produced by similar or closely interacting groups, while different pottery wares and types could indicate the presence of unrelated groups in the area.

Lithic studies constitute another avenue of valuable information. A lithic study of particular interest for our research was conducted by Eschman on sites from the NMAP project area (1983: 382-384). In brief, during his analysis of Archaic sites, he found several sites or site components that were apparent Archaic sites, but which had radiocarbon dates that placed them during Anasazi times. Eschman considers these sites to be very late hunter-gatherer (as opposed to Puebloan) sites on the basis of several lines of information. His main argument is based on the lithic assemblage. According to Eschman, the sites in question are similar to an Archaic lithic pattern rather than an Anasazi lithic pattern. His study found that there were significant differences in material type selection between Archaic and Anasazi sites, and also that Archaic sites had a significantly higher proportion of bifacial reduction debitage. He concluded that these results supported Chapman's (1977) impression that the Archaic lithic technology was labor intensive while the Anasazi lithic technology was an expedient strategy requiring a minimal labor investment. We will examine lithics from the Farmington sites in terms of the information discussed by Eschman and Chapman concerning Archaic versus Anasazi lithic assemblages.

As Eschman notes, however, there are difficulties with this characterization of lithic assemblages as Archaic or Anasazi (1983: 382-384). It is certainly possible that any observed lithic assemblage variability relates entirely to site function and has little to do with chronology. As Eschman points out, a lithic quarry site would look the same if it were produced by a PaleoIndian, Archaic, or Anasazi group. This problem illustrates the need for futher examination of lithic technology and material type selection in the context of site function within the overall subsistence system of the area during the several time periods of interest.

This discussion underscores the point that none of the lines of evidence discussed in this section can serve as a single, unambiguous means of separating forager-produced from sedentist-produced limited-activity sites. Taken together, however, they can serve as indicators of group composition. This body of information will not help us to determine which group produced every site, but it will help us to classify more sites than we have previously been able to do. For example, an ephemeral sherd scatter that is in fairly close proximity to a pueblo, has similar pottery wares and types, and falls within the same time period, would have a stronger chance of being related to that pueblo than a site that meets none of these criteria. Examining the sherd and lithic scatters in these terms will yield more productive information than applying unrealistic identification criteria, or simply assuming that all the small sites are associated with the pueblos of the area.

This research, then, will examine the Farmington area of northwestern New Mexico in terms of the model of adaptive diversity. We are interested in determining if a strategy alternating between a sedentary and a nomadic adaptation was present in the area. We also wish to determine if sedentists and nomads occupied certain of the same territories simultaneously. The nature of their interactions in this territory is also of interest. To accomplish this research, we will first examine information concerning the hunter-gatherers and sedentary agricultural adaptations in the area, with the purpose of developing a greater understanding of the logistical requirements of these systems. We will then use the lines of evidence discussed in the preceding paragraphs to identify which sites were produced by sedentists and which were produced by nomads. Using these conclusions, in combination with prior research on the larger pueblos of the area, we will determine if a strategy of adaptive diversity was operating in the area during later Anasazi times.

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Chapter 5 • Test Excavations at Twenty-Two Prehistoric and Early Historic Sites

Jack B. Bertram

Introduction

This report describes the results of testing carried out on 22 prehistoric and early historic Native American sites of the Farmington Sector, Elena Gallegos Land Exchange Project. The sites are located in the uplands overlooking the confluence of the Rio La Plata, Rio Animas, Rio San Juan, and Farmington Glade drainages near the city of Farmington, New Mexico.

Fieldwork for testing of these sites was done by USFS crews during the period of December, 1981, through May, 1982. Fieldwork included mapping, collection of surface artifacts, shovel and auger testing, and the excavation of formal test pits as appropriate. Collected samples included ceramics, lithic artifacts, soil and macrobotanical samples, pollen samples, radiocarbon samples, dendrochronological samples, and archaeofaunal bone and shell.

I worked with a substantial data base in the course of report preparation. Data made available by the USFS included field notes and maps, field photographs, some artifact illustrations, field specimen catalogs, and preliminary manuscripts describing the results of pollen, macrobotanical, ceramic, and faunal analyses. The results of analyses on dating samples were made available as summary data organized by general proveniences. Radiocarbon dates are presented below in conformity with current usage as uncorrected age B.P., followed in parentheses by the laboratory code and sampling number and the 95% probability range and corrected midpoint dates as calculated from the Klein et al. (1982) consensus calibration.

In the following sections, sites are discussed in ascending field site number order. All sites described below are numbered according to their original field designations, which were of the form FA m-n. The prefix FA signifies Farmington sector, m indicates a crew number, and n indicates the crew site number.

FA 1-1

Site FA 1-1 is a small multicomponent sherd and lithic scatter, which was assigned the Laboratory of Anthropology number LA 33719.

Location

The site is located in the Animas drainage on the southeast flank of Hood Mesa, in Township 30N, Range 12W, Section 17. The site lies near the crest of a sandstone ridge, on a southerly slope, overlooking a southeasterly trending, unnamed tributary of Flora Vista Arroyo, at an elevation of 5,820 ft. (1,774 m.). Sites FA 1-2 and FA 1-4 lie to the southeast on the same ridge. The ridge top provides an overview of Flora Vista and Johnson arroyos and of a portion of the lowermost Rio Animas valley. The site has been largely devegetated by sheetwash and headward rill cutting. A few junipers represent the only prominent vegetation.

Survey Description

The site was characterized on survey as a disarticulated hearth with associated scatters of burned rock and of stone artifacts. A corner-notched arrow point was collected 47 m. to the west of the hearth scatter. The site was judged to be totally deflated by water erosion and to retain only minimal research potential.

Testing Procedures

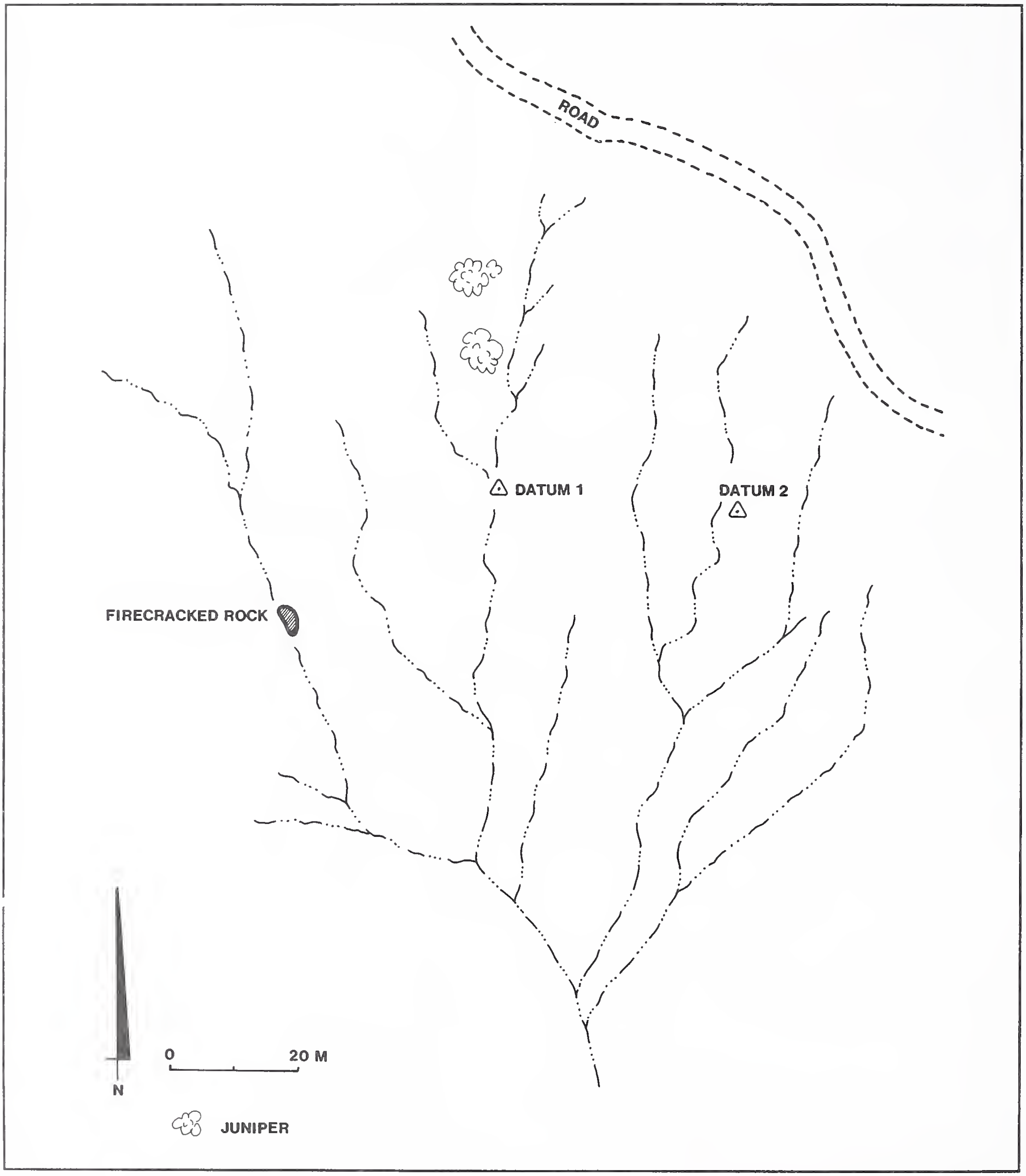
The site was tested on several days between April 20 and May 4, 1982. Testing consisted of installing two datum stakes, site inspection and artifact flagging at a 5 m. transect interval, compass-and-pace mapping, total surface collecting of all flagged artifacts and of representative examples of burned rock, installing 16 shovel tests, and excavating two 1 by 1 m. test pits (Map 5-1). Fill from both shovel tests and test pits was screened through 1/4-in. mesh.

Surface Description

Surface examination revealed a moderate (1 item/15 sq. m.) concentration of artifacts lying just east of Datum 2, with much sparser (1 item/300 sq. m.) scatters extending westward to Datum 1 and beyond Datum 1 for some 60 m. to the north, west, and southwest. Burned rock concentrations were noted at Datum 1, at and near Datum 2, 50 m. north of Datum 2, and 65 m. south of Datum 2. The concentration of artifacts was composed of Mesa Verde Corrugated sherds from 4 or 5 vessels and a single undifferentiated plain sherd, which may represent another vessel (Raish, this volume). A mano, two cores, a core tool, and two ground stone fragments were also collected. Sparse scatters were composed predominantly of flakes. Other items from the sparser areas of the site included a cobble tool east of Datum 2, a core tool southwest of Datum 1, a core north of Datum 1, a chopper west of Datum 1, and a flake tool northeast of Datum 1. A large distal fragment of a projectile point was found between the two datum points.

Subsurface Testing

Shovel testing was directed both toward sampling the general site area and also toward evaluating subsurface integrity in the vicinity of burned rock scatters and soil discolorations (see Table 5-1). Shovel Test 3, Datum 1,



Map 5-1. Site FA 1-1 is a small multicomponent sherd and lithic scatter.

produced substantial subsurface ash staining to a depth of 32 cm. with an associated angular debitage fragment. In contrast, only sparse cultural materials were encountered in Shovel Test 8, Datum 2 (probably disturbed burned rock and charcoal flecks), and in Datum 1 Shovel Test 4 (one flake), Shovel Test B (burned rock), and Shovel Test C (thin surficial ash lens). The other 13 tests produced no cultural materials, but indicated that the site was characterized by a mixed sand, decomposed sandstone, and decomposed blue-gray shale soil of a typical depth of 20 cm. overlying sandstone bedrock.

Two diagonally contiguous 1 by 1 m. test pits were excavated in natural levels with 10 cm. artificial sublevels, so as to further explore the ash lens discovered in Datum 1, Shovel Test 3. These test pits were laid out with their southeast and northwest corners, respectively, on a subdatum located at 245 degrees and 36 m. from Datum 1 (Fig. 5-1). The southwestern portions of both units had been disturbed and deflated by rill erosion. Excavation revealed that the shovel test had intruded through the surface sand (Stratum 1) into a basin hearth (Feature 1) filled with ash-stained and charcoal-flecked dark brown sand. The oval hearth basin was 60 cm. in diameter and extended to a depth of 35 cm. below surface. Its original occupation level could not be determined. It lay within an ash-stained, organic, brown-sand, cultural layer (Stratum 2), which in turn overlay sterile yellow sand (Stratum 3). Bedrock was encountered at 10-30 cm. below subdatum. The hearth and surrounding occupation level produced bone, debitage, and burned rock. A combined radiocarbon sample from all three levels of the hearth and from Stratum 2 was dated at 4180 $\pm$ 90 B.P. (TX-4927, 3045 B.C. to 2430 B.C. with midpoint at 2738 B.C. according to the Klein et al. [1982] 95% confidence tables).

Analyzed Samples

To date, samples analyzed from FA 1-1 include the radiocarbon sample, the vessels from the Datum 2 surface concentration, and bone samples from Stratum 2, Levels 1-3 proveniences. A sample of one Mesa Verde Corrugated vessel was experimentally refired by Raish (this volume), who suggested that the resultant refired color, yellow-red, probably indicates local manufacture of the vessel in the Farmington-Aztec-Bloomfield area. She reported that vessels from that area tended more commonly to refire experimentally to yellow-red than did ceramics believed to have been made in other possible ceramic source areas.

Archaeofaunal specimens (Bertram, this volume) included ten fragments from both large and rabbit-sized animals. Most of the specimens were burned while green and all were severely leached, indicating that preserva-

Table 5-1. Site FA 1-1, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	46	17	30	-	No
2	1	50	35	20	-	Yes
3	1	36	242	32	A,D	Yes
4	1	36	240	40	D	Yes
A	1	5	338	30	-	Yes
B	1	3	342	30	R	Yes
C	1	2	13	40	A	Yes
D	1	3	50	50	-	No
1	2	24	350	25	-	Yes
2	2	10	60	20	-	Yes
3	2	7	72	20	-	Yes
4	2	3	96	30	-	No
5	2	7	148	17	-	Yes
6	2	0	0	30	-	Yes
7	2	13	125	25	Y	?
8	2	63	161	20	R,C	Yes

Key: A-Ash Stain, D-Debitage, R-Fire-Cracked Rock, C-Charcoal, S - Sherds, B-Bone tion was poor and that if nonburned and thus less durable bone had been originally present, it may have been unrecoverable or unobserved due to decomposition.

Comments

Site FA 1-1 was probably occupied during several periods. Excavation data are insufficient to permit confident association of the burned rock scatters, the debitage scatters, and the ceramic concentration. It seems clear that the Feature 1 area was occupied during the late Middle Archaic, as a processing station or small camp. The projectile point fragment may pertain to this occupation. The number of culinary vessels encountered near Datum 2 may indicate regular, short-term reuse of a restricted portion of the site during the PIII period. The corner-notched arrow point could be a PIII artifact, but

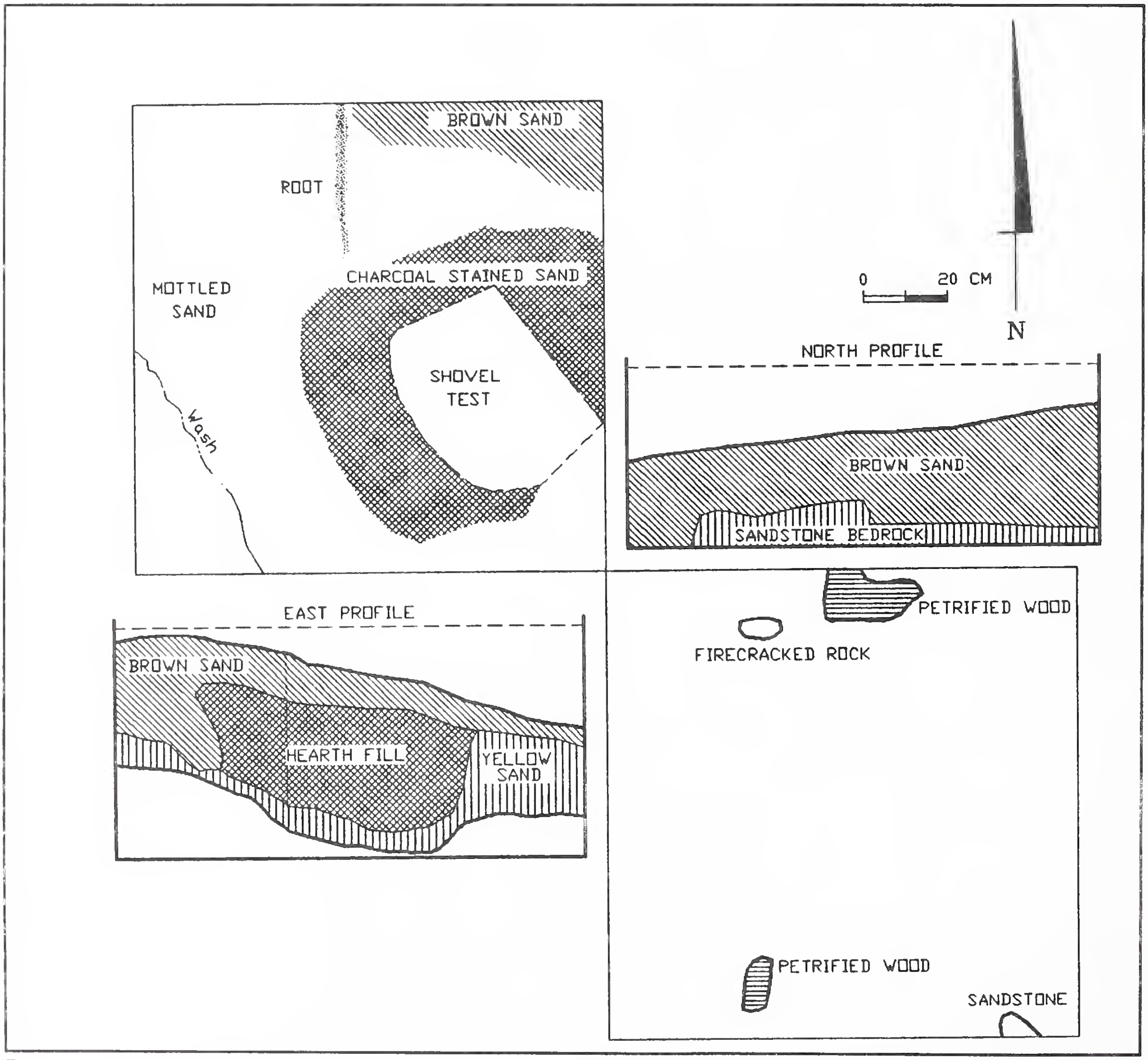


Figure 5-1. Site FA 1-1, plans and profiles of two adjacent test pits in Feature 1.

more likely pertains to the BMIII/PI periods. The ground stone, debitage, and burned rock scatters may pertain to either occupation or to other occupations not indicated by recovered diagnostic items or dates. However, the deflated and eroded condition of the site area suggests that reconstruction in detail of the sequence, magnitude, and character of occupation would necessarily be speculative.

FA 1-2

Site FA 1-2 is a Middle Archaic artifact scatter, with possible Anasazi reoccupation, having associated hearth remnants and ground stone. It was assigned the Laboratory of Anthropology number LA 33720.

Location

The site is located 1,000 ft. (305 m.) southeast of Site FA 1-1. Its setting is identical to that of FA 1-1 except that it is slightly lower, at 5,800 ft. (1,768 m.) elevation. It is also less eroded and possesses some mixed grass cover. It is set atop a ridge within a moderately dense juniper stand.

Survey Description

The site was characterized on survey as several cobble and ground stone clusters with associated, sparse chipped stone artifacts. Only one cluster was mapped. The site was judged to be totally eroded and to retain only minimal research potential. No diagnostic items were noted and no collections were made during survey.

Testing Procedures

The site was tested in two field sessions from March 24 to April 1, 1982. Testing consisted of installing four datum stakes, inspecting the site and flagging the artifacts, mapping the site using paced measurements and compass directions, surface collecting of all flagged artifacts, installing nine or more shovel tests, and excavating of two 1 by 1 m. test pits (Map 5-2). All fill was screened through 1/4-in. mesh.

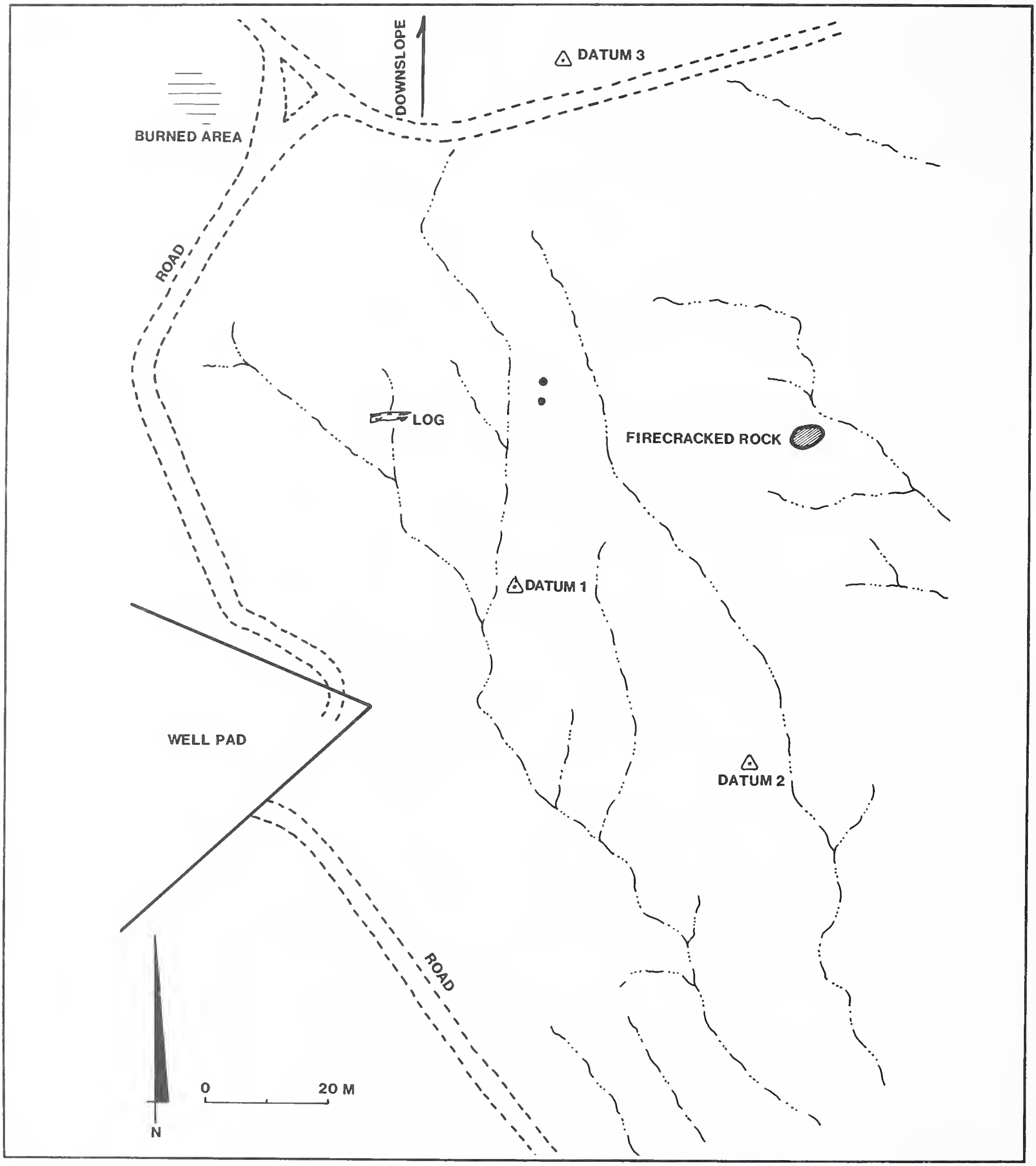
Surface examination of the site revealed a moderately eroded, dispersed distribution of artifacts extending 120 m. north-south and 80 m. east-west. The site extended across a low, sandy slope cut by shallow rills, covered by clump grasses and juniper, and disturbed by a drill pad and associated two-track roads to the north and west. Possible features observed included (a) a burned area at the northwestern site margin; (b) burned rock concentrations 4 m. south, 20 m. south, and 50 m. northeast of Datum 1; and (c) a possible water control feature 65 m. southeast of Datum 1. Artifact densities ranged from moderate (1 item/3 sq. m.) to very sparse (1 item/3,000 sq. m.). The most common artifacts were flakes and ground stone items, many of which were burned. Surface items collected in the central site area were mapped from Datum stakes 1 and 2. These included metate fragments, a mano, 14 pieces of unspecified ground stone, at least 19 pieces of debitage, 3 chopper/pounders, 4 cores with possible tool use, and 1 Mancos Corrugated sherd. Items in the northern site area were mapped from Datum 3. These included a mano, four debitage pieces, a biface, and a core. Items in the southern site area were mapped from Datum 4; they were a mano, 4 pieces of ground stone, at least 14 pieces of debitage, and a core.

Subsurface Testing

Shovel testing was directed at assessing burned rock scatters, apparent stains, and the possible water control feature. Field notes describe nine shovel tests, all plotted from Datum stakes 2 and 4 (Table 5-2). Shovel Test 1, Datum 2, produced a flake near the surface, and Shovel Test 3, Datum 2, yielded burned and unburned bone and ground stone in near-surface yellow loamy sand. Charcoal flecks were noted in Shovel Test 4, Datum 2, and in Shovel Test 2, Datum 4. The possible water-control feature appeared upon testing to be decomposing bedrock. Datum 2 shovel tests typically found brown sand overlying yellow sand, with decomposing yellow sandstone or compact yellow sand being encountered at 15-30 cm. The Datum 4 tests farther downslope generally encountered deeper deposits of mixed sand and shale or clay, with bedrock being reached only in tests 1 and 5. These contrasting results may reflect differences either in downslope geological substrate or in recent deposition and erosion.

A metric grid system was laid out to the south of Datum 1, (which was defined as 100 m. north, 100 m. east). Test pits were opened in Grids 80N/101E and 96N/103E, as defined by their northwest corners. Grid 96N/103E apparently lay within the concentration previously mapped by the survey team, so it was initially designated as Feature 1. Test results, however, indicated the feature designation should be dropped. Grid 80N/101E, in a similar concentration of ash and burned ground stone, was designated as Feature 2 by the testing team. Excavation in both pits was carried out in 10 cm. levels, and each pit was dug to approximately 30 cm.

Excavation of Grid 96N/103E (Fig. 5-2) revealed a dark sand layer from 12 cm. to 20 cm. thick (Stratum 1), grading rapidly into a pale sand (Stratum 2), which continued to pit closure at 30 cm. below surface. Level 1 (0-10 cm.), which sampled only Stratum 1, produced approximately 20 flakes and several small flecks of charcoal, which were not collected. Level 2 (10-20 cm.



Map 5-2. Site FA 1-2 is a Middle Archaic artifact scatter, with possible Anasazi reoccupation, having associated hearth remnants and ground stone.

deep), which sampled Stratum 1, the Strata 1-2 contact, and the upper few centimeters of Stratum 2, produced about 10 items of debitage, a single burned rock, pollen and floatation samples, and a small charcoal sample. Level 3 (20-30 cm. deep) sampled the westernmost portion of the Strata 1-2 contact and Stratum 2. It produced two flakes and a second small charcoal sample. Combining the two charcoal samples produced a date of 2950 ± 460 B.P. (TX-4917, 1855 B.C. to 585 B.C. with midpoint at 1220 B.C. according to the Klein et al. [1982] 95% confidence tables). On the basis of artifact frequency and staining character, the recovered materials from this unit all appear to pertain to Stratum 1, which would seem to be a mixed or trampled use surface containing deflated or otherwise unrecognizable hearth debris. Floatation of the sample taken from the west pit wall just above the Strata 1-2 contact recovered only unburned materials typical of the site today (Donaldson, this volume). This can be seen as further indication of mixing or disturbance.

Excavation of Grid 80N/101E (Feature 2) produced a more complex stratigraphic sequence (Fig. 5-3). The soil surface Stratum 1, only about 2-3 cm. thick, resembled Stratum 1 of the previous grid in color and character. It was immediately underlain by Stratum 2A, a charcoal-stained soil varying in thickness from 12 cm. to 20 cm. Stratum 2A completely contained Stratum 2B, an oxidized and probably burned sand lens roughly 50 cm. in diameter, 6 cm. thick, and lying in the northeast quadrant of the unit at a depth of 5-12 cm. below surface. Stratum 3, a sterile yellow sand, seems to have been intruded by or intermixed with Stratum 2, perhaps by burrowing or aeolian reworking. Stratum 3 thus underlies Stratum 2 in most of the unit, but in the northern portion is itself underlain by Stratum 2C, which is indistinguishable from Stratum 2A and in contact with it in the east and west profiles. This stratigraphy may indicate that Stratum 2A was transported down into Stratum 3 or that aeolian transport may have moved the sterile Stratum 3 across Stratum 2 in the course of its deposition. A third explanation is that Strata 2A and 2C may represent two distinct cultural levels separated by a discontinuous aeolian/colluvial deposition, with 2A intruded into 2C at the bottom of a hearth.

Excavation was carried out in horizontal 10 cm. units. Unit 1 (0-10 cm. deep) sampled Strata 1 and 2A. It contained a flake, a burned ground stone piece, a fragment of burned rock, and burned bone. Samples of charcoal, soil, and pollen were collected. Unit 2 (10-20 cm. deep) contained samples of Strata 2A and 3 and the whole of Stratum 2B. It produced burned and unburned ground stone and burned bone. A charcoal sample was collected, which produced a date of 3800 ± 120 B.P. (TX-4916, 2545 B.C. to 1965 B.C. with midpoint at 2255 B.C. according to the Klein et al. [1982] 95% confidence tables). Level 3 (20-34 cm. deep) produced no cultural materials other than charcoal, which was collected. Pollen samples were taken from Stratum 2 and from Stratum 3.

Analyzed Samples

Floatation samples from the soil of Level 1 produced only unburned and probably modern local vegetation rem-

Table 5-2. Site FA 1-2, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	2	0	0	28-30	D	Yes
2	2	17	119	15	-	?
3	2	14	70	20	R,B	Yes
4	2	9	211	22	C?	?
1	4	4.5	277	16	-	?
2	4	2.5	324	35	C	No
3	4	7	284	25	-	?
4	4	12.5	151	40	-	No
5	4	25	294	15	-	Yes

Key: D-Debitage, C-Charcoal, R-Fire-cracked Rock, B-Bone

Note: Other unreported tests were dug.

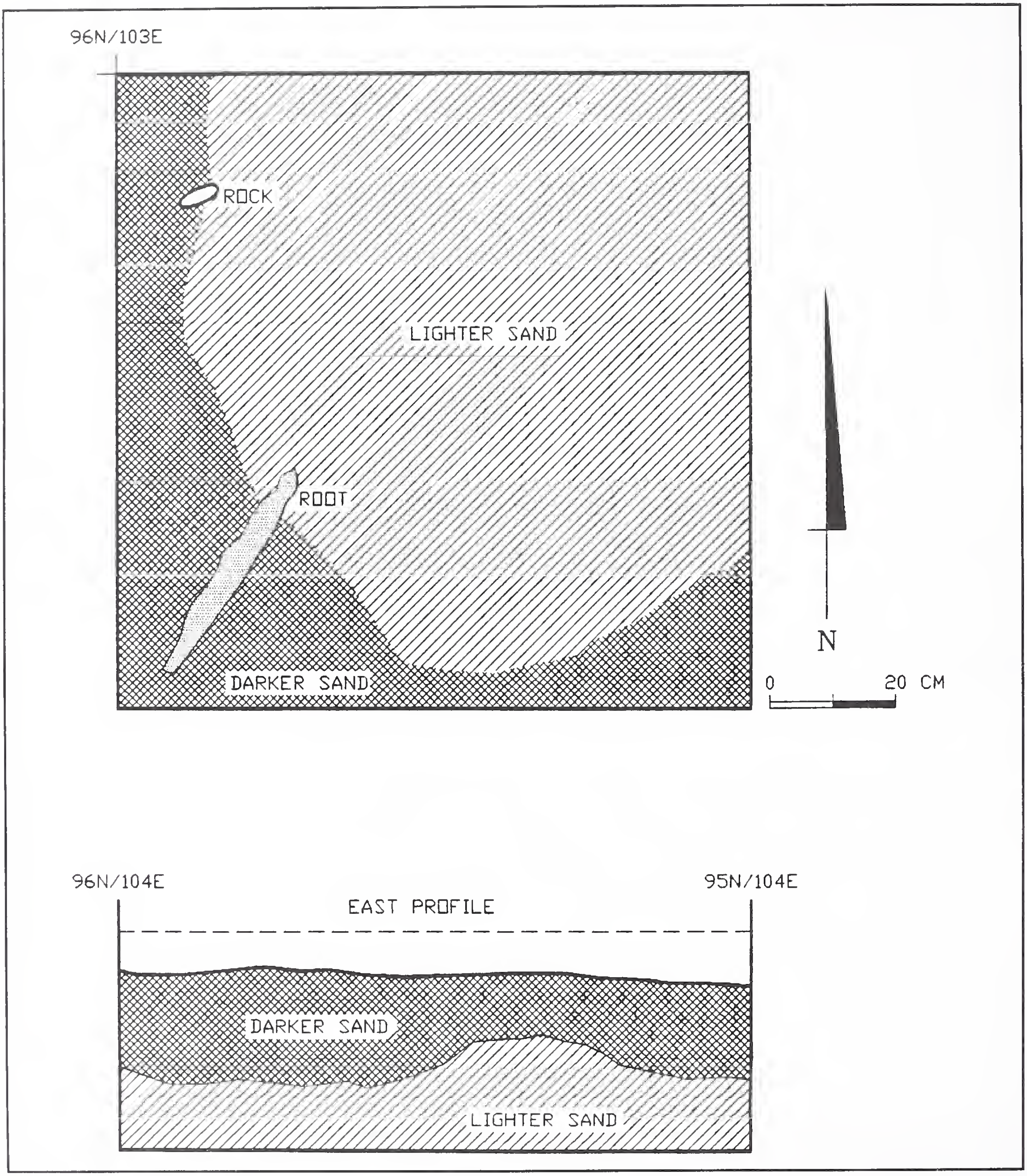


Figure 5-2. Site FA 1-2, Unit 96N/103E.

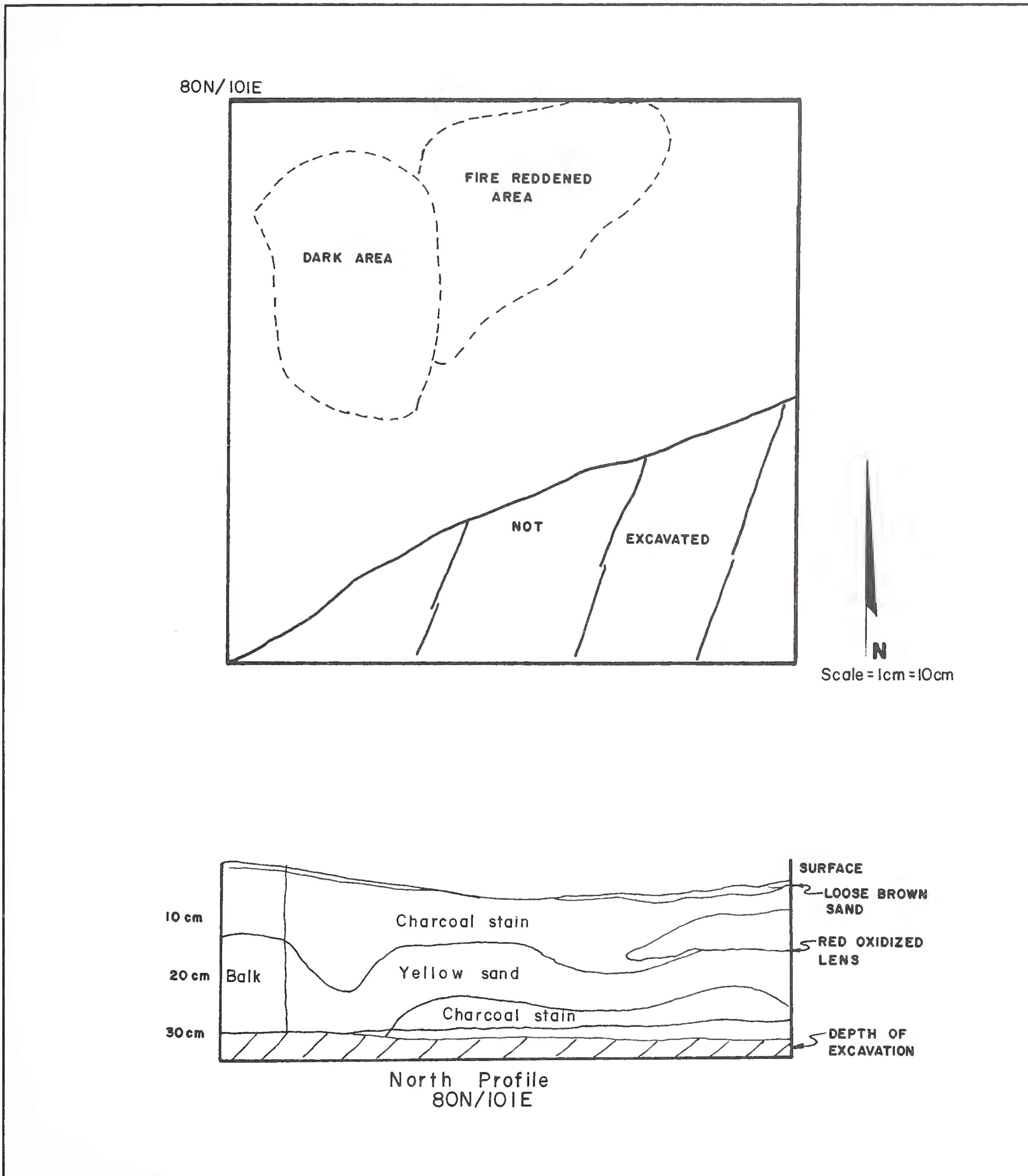


Figure 5-3. Site FA 1-2, Unit 80N/101E.

nants or intrusions (Donaldson, this volume). Analysis of the pollen samples collected at ground surface, at 22 cm. below surface from within Stratum 2, and from within Stratum 3 produced remarkable results. The Stratum 3 and surface pollen indicated similar local vegetation, with the primary difference being less pinyon in the buried sample. Both contained predominantly pinyon and juniper and sparser cheno-am pollens. By contrast, the sample collected in the Strata 2A-2C contact zone, below the locus of the radiocarbon sample, produced pollen indicating corn, other grasses, prickly pear, cholla, composites, and abundant cheno-ams, all of which seem to have been processed (Scott Cummings, this volume). The bone collections were not analyzed.

Comments

The data recovered from FA 1-2 seem to indicate that the site may consist of one or more Middle Archaic occupations, with very sparse evidence (one sherd) of later reoccupation. The abundance of ground stone and the frequency of burning observed on ground stone suggest multicomponent occupation as a plant-processing or generalized campsite.

The data from Feature 2 suggest that this site and others like it may eventually provide evidence of very early corn cultivation as a component of a highly diversified gathering strategy in the Middle Archaic period. Unfortunately, the data from Feature 2 are open to multiple interpretations because of the complex stratigraphy of the excavated unit. The corn pollen may be intrusive, and the deposits may be mixed or inverted.

FA 1-5

Site FA 1-5 is a Middle Archaic lithic scatter with one hearth. It was assigned the Laboratory of Anthropology number LA 33723.

Location

Site FA 1-5 is located atop the hogback mesa dividing the Farmington Glade and La Plata River drainages, in Township 30N, Range 13W, Section 27. The site lies at an elevation of 5,720 ft. (1,743 m.) adjacent to a constriction in the mesa top formed by arroyos cut in from both the glade and the river. Actual site exposure is easterly, but sweeping overviews in all directions except north may be found within a short distance. The site retains some vegetative cover, which is dominated by bunch grasses, pinyon, and juniper, along with Mormon tea, scrub oak, sage, rabbitbrush, and other shrubs.

Survey Description

The site was characterized on survey as a hearth with associated deer bone and one mano. The site was interpreted as historic Amerindian and was judged to be largely intact.

Testing Procedures

The site was tested on April 19, 1982. Testing consisted of installing a single datum point, inspecting the site and flagging artifacts at close intervals, mapping the site using paced measurements and compass directions, surface collecting of all artifacts lying in the immediate site area, installing three shovel tests and excavating two adjacent 1 by 1 m. test pits.

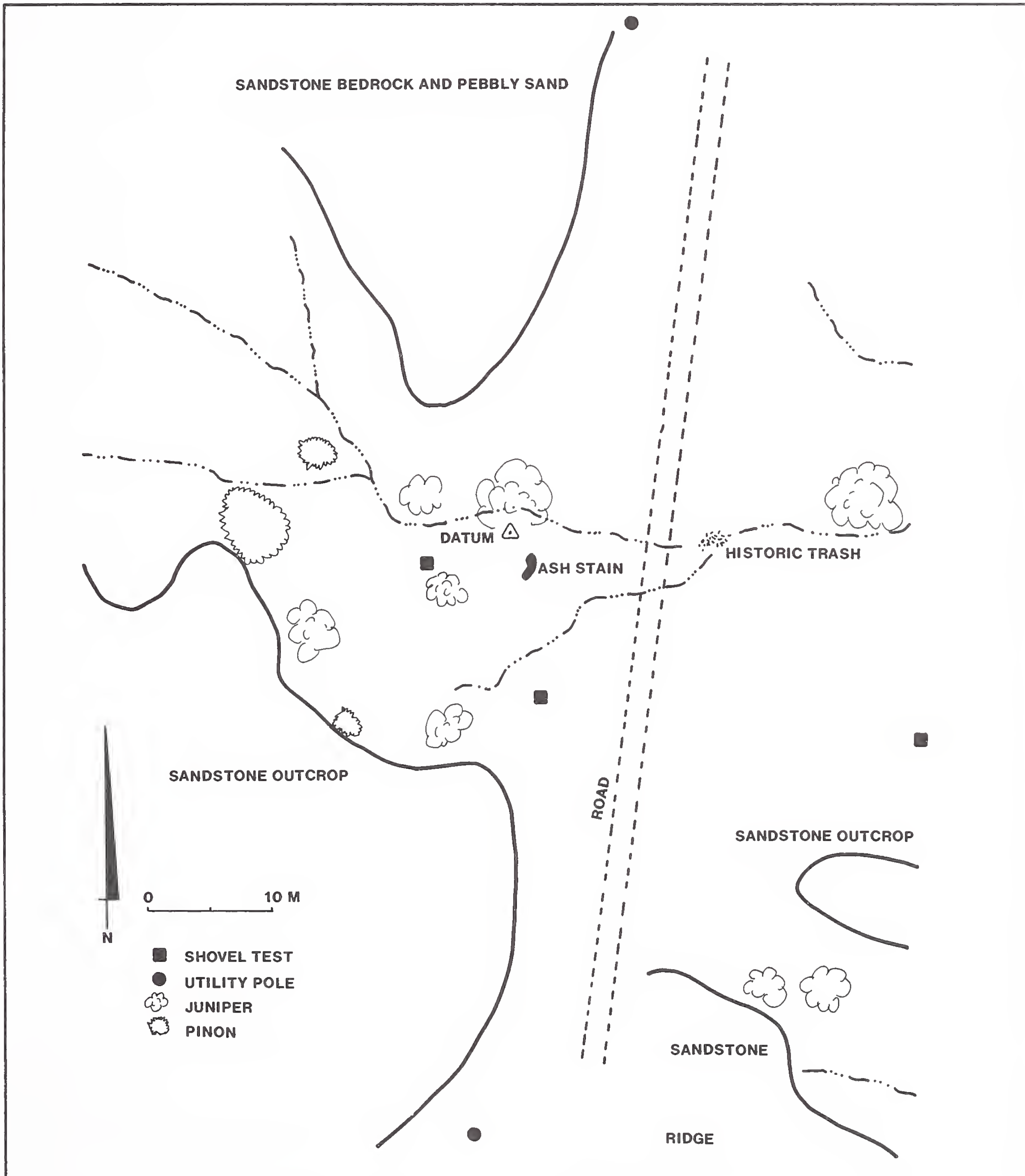
Surface Description

Surface examination revealed that the site was cut by a powerline access jeep trail running north-south just to the east of the possible hearth (Map 5-3). Two minor rills drain eastward on either side of the hearth. Also recorded was a sparse artifact scatter unreported by the survey team and not clearly associated with the hearth. This scatter lay predominantly to the south of Datum 1, although some artifacts were encountered to the east and west as well. Artifacts collected from the surface included approximately 25 flakes, 4 cores (one of which refit to a flake), 1 cobble tool, 1 hammerstone, and 1 sherd. The sherd was identified only as an undifferentiated whiteware (Raish, this volume). Historic trash, not described or collected, was reported downslope from the hearth. Two collected mule deer bones may pertain to this assemblage, as they were cut with a steel ax or cleaver (Bertram, this volume).

Subsurface Testing

Three shovel tests were installed to evaluate potential deposition outside the hearth area (Table 5-3). None were culturally productive, but the potential for deep soils was indicated by bedrock depths of 50 cm. south of the hearth and of greater than 50 cm. west of the hearth.

Defining Datum 1 as 100N/100E, a 1 by 1 m. test pit was placed with its northwest corner at Grid 98N/101.5E, so that it bisected the suspected hearth, Feature 1. Upon excavation, it was found that the hearth lay almost entirely in Grid 97N/101.5E, so that grid was also opened (Fig. 5-4). Both grids were excavated to 20 cm. below surface. The suspected hearth was pedestaled and excavated separately in halves to allow sectional profiling. Two horizontal strata and a probable charcoal-filled basin were found in a deposit clearly disturbed by past and ongoing rodent burrowing. Stratum 1, nowhere



Map 5-3. Site FA 1-5 is a Middle Archaic lithic scatter with one hearth.

Table 5-3. Site FA 1-5, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	7	250	50	-	No
2	1	13	170	50	-	Yes
3	1	37	115	30	-	No

more than 3 cm. thick, was a loose, yellowish-gray sand grading to grayish color over the feature and to yellow elsewhere. The stratum probably derived from surface mixing of hearth fill and the matrix of Stratum 2, which was composed of yellow sand. Feature 1 was a simple, unlined basin, probably intruded into Stratum 2 from a surface level now lost. It was probably about 40 cm. in diameter; rodent and root disturbance had obscured its outline. Its original depth was in excess of the 10 cm. recovered, and the fill was charcoal mixed with sand. No artifacts were found in either stratum or in the feature, but a small flake was dislodged while cleaning pit walls.

Analyzed Samples

Samples from testing included combined charcoal and floatation from the feature fill, as well as pollen from Stratum 2 and from the feature fill. Radiocarbon analysis produced a date of 3350 $\pm$ 90 B.P. (TX-4918, 1900 B.C. to 1424 B.C. with midpoint at 1662 B.C. according to the Klein et al. [1982] 95% confidence tables). Macrobotanical analysis produced unburned ricegrass and goosefoot and burned pinyon wood, juniper wood, and juniper seeds (Donaldson, this volume). The sample is interpreted as fuel remnants with recent intrusive pollen. The pollen sample from the hearth was too small to analyze, and the second pollen sample indicated no economic activity, being composed of species found at the site (Scott Cummings, this volume).

Comments

The data indicate the feature was a Middle Archaic hearth, which may be associated with some of the surface artifacts. The deer bones are possibly associated with a historic component downslope. The presence of scattered debitage and corcs, with a refit reported, probably indicates that the site served as a routinely used hunting overlook and tool-production station over a period of several thousand years.

FA 1-9

Site FA 1-9 is a sparse burned rock, chipped stone, and ground stone scatter with several concentrations. It was assigned the Laboratory of Anthropology number LA 33727.

Location

The site is situated on an isolated mesa which is drained by the San Juan River, 4 km. to the south. It is located in Township 29N, Range 12W, Section 8. The site lies above the northern head of an unnamed canyon that bisects the mesa, overlooking the canyons and mesas of the San Juan valley to the south and southwest, at an elevation of 5,770 ft. (1,759 m.). Site FA 1-10 lies some 150 m to the east and Site FA 2-18 is situated just across the canyonhead to the southwest. The site lies in coppice-dune flats and was detected in blowouts that are partially stabilized by juniper and Mormon tea scrub grassland.

Survey Description

The site was described on survey as an undiagnostic cluster of six concentrations of burned rock and ground stone fragments with some chipped stone. It was estimated to retain substantial research potential for subsurface and intact surface deposits.

Testing Procedures

The site was tested on March 17, 1982. Testing consisted of flagging all artifacts observed in three loci (which appear to include at least five of the six concentrations reported on survey), mapping and collecting all surface artifacts by locus, and placing a linear transect of 30-cm.-deep shovel cuts spaced at 1 m. intervals across each locus. Hand auger tests were placed into shovel test pit floors. Only the transect across Locus 1, which apparently consisted of some 40 tests, was mapped.

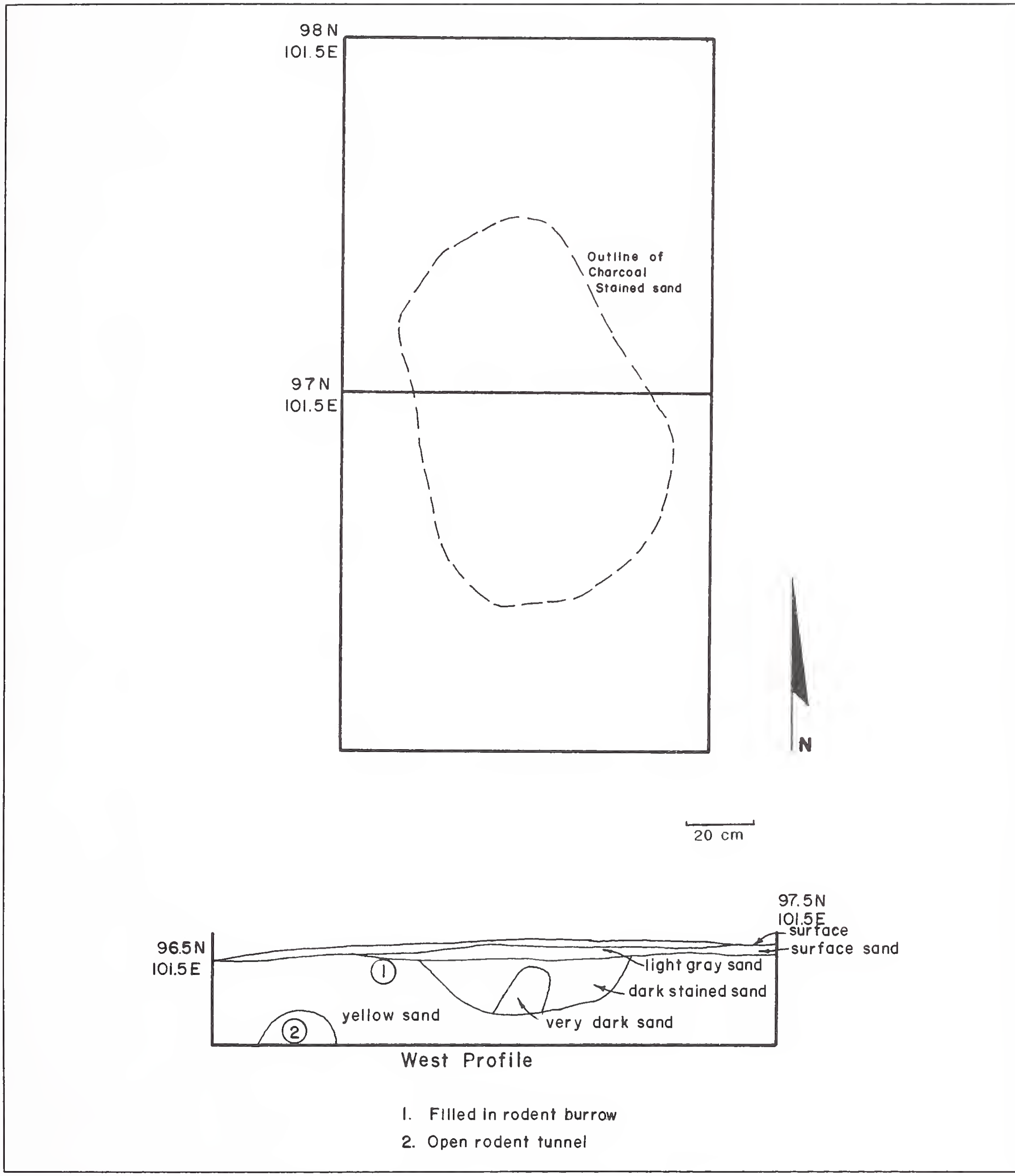


Figure 5-4. Site FA 1-5, Feature 1.

Surface Description

Surface examination (Map 5-4) revealed that Locus 1, at the datum, consisted of a blowout containing a large cobble used as both an anvil and a nonspecific grinding surface, associated with about ten flakes, a scatter of burned rock at the southwest end of the locus, and a projectile point distal fragment. Locus 2, 60 m. west of the datum, lay on a sandy flat and contained burned rock, five flakes, and a biface point blank. Locus 3, a pair of blowouts 60 m. east of the datum, contained two manos, four flakes, and four concentrations of burned rock.

Subsurface Testing

As many as 100 shovel test cuts were dug; notes indicate that no subsurface cultural deposits or artifacts were recovered. No samples were collected, nor was chronometric data obtained from the site.

Comments

This site appears to represent a sparse extension of its eastern neighbor, Site FA 1-10 (see below). It probably represents one or more ephemeral gathering and processing occupations pertaining to the Archaic or Anasazi periods.

FA 1-10

Site FA 1-10 is composed of two small scatters of burned rock, chipped stone, and ground stone. It was assigned the Laboratory of Anthropology number LA 33728.

Location

The site is located about 100 m. east-northeast of Site FA 1-9 and has a similar situation, elevation, setting, and vegetation. A portion of the site may extend into Township 29N, Range 12W, Section 9.

Survey Description

The site was described on survey as two clusters (Loci 1 and 2) of burned rock, about 20 pieces of debitage, and a possible hearth. Research potential for this partially deflated but undisturbed site was judged to be primarily in obtaining chronometric data.

Testing Procedures

The site was tested on March 16, 1982. Testing was done by methods similar to those used on Site FA 1-9, except that two perpendicular shovel-test transects, rather than a single transect, were placed across Locus 2.

Surface Description

Surface examination (Map 5-5) revealed that Locus 1, centered 6 m. north of the datum, lay in a blowout and contained a mano associated with an ash stain and several burned cobbles. Several more cobbles were scattered over a distance of 10 m. across the blowout slope to the west. Locus 2, 30 m. to the west of the datum and near Site FA 1-9, consisted of a dense cluster of burned rock and a scatter of about seven flakes lying within 15 m. of the cluster. Ash staining was not observed at Locus 2.

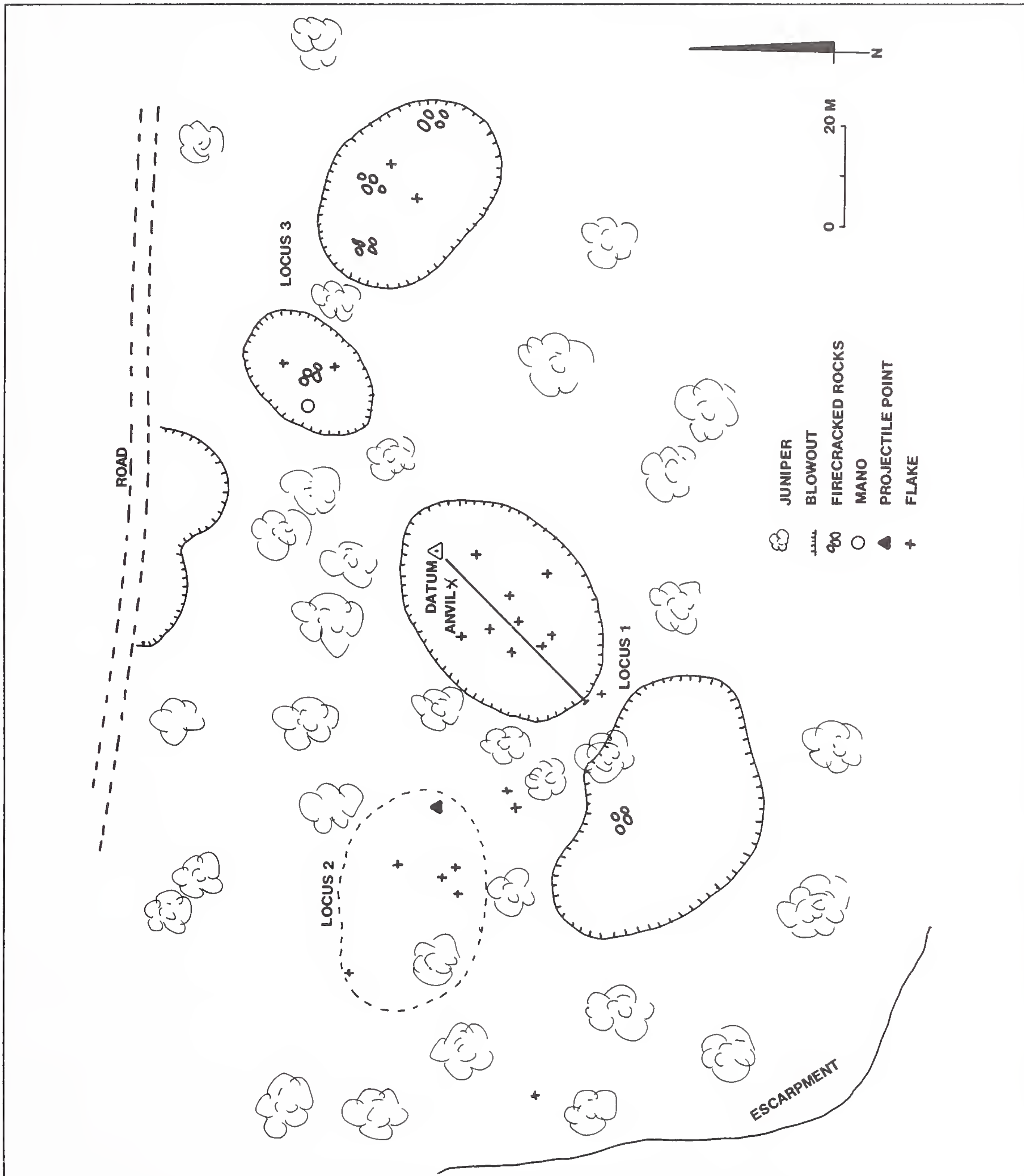
Subsurface Testing

Shovel testing at Locus 1 consisted of 15 tests oriented along a north-south transect across the stained area. Heavy staining was encountered in the Locus 1 concentration. Ash and charcoal were present in a circular area measuring 0.7 m. in diameter and extending from 7 cm. to 15 cm. below the surface. Debitage, charcoal, floatation soil, and a seed were collected from within the stained area. The charcoal sample appears to have been too sparse to date, as Donaldson (this volume) reports that no charcoal was found in the floatation sample. Unburned tickseed (probably intrusive) was identified from the floatation, and a single burned juniper seed was collected separately.

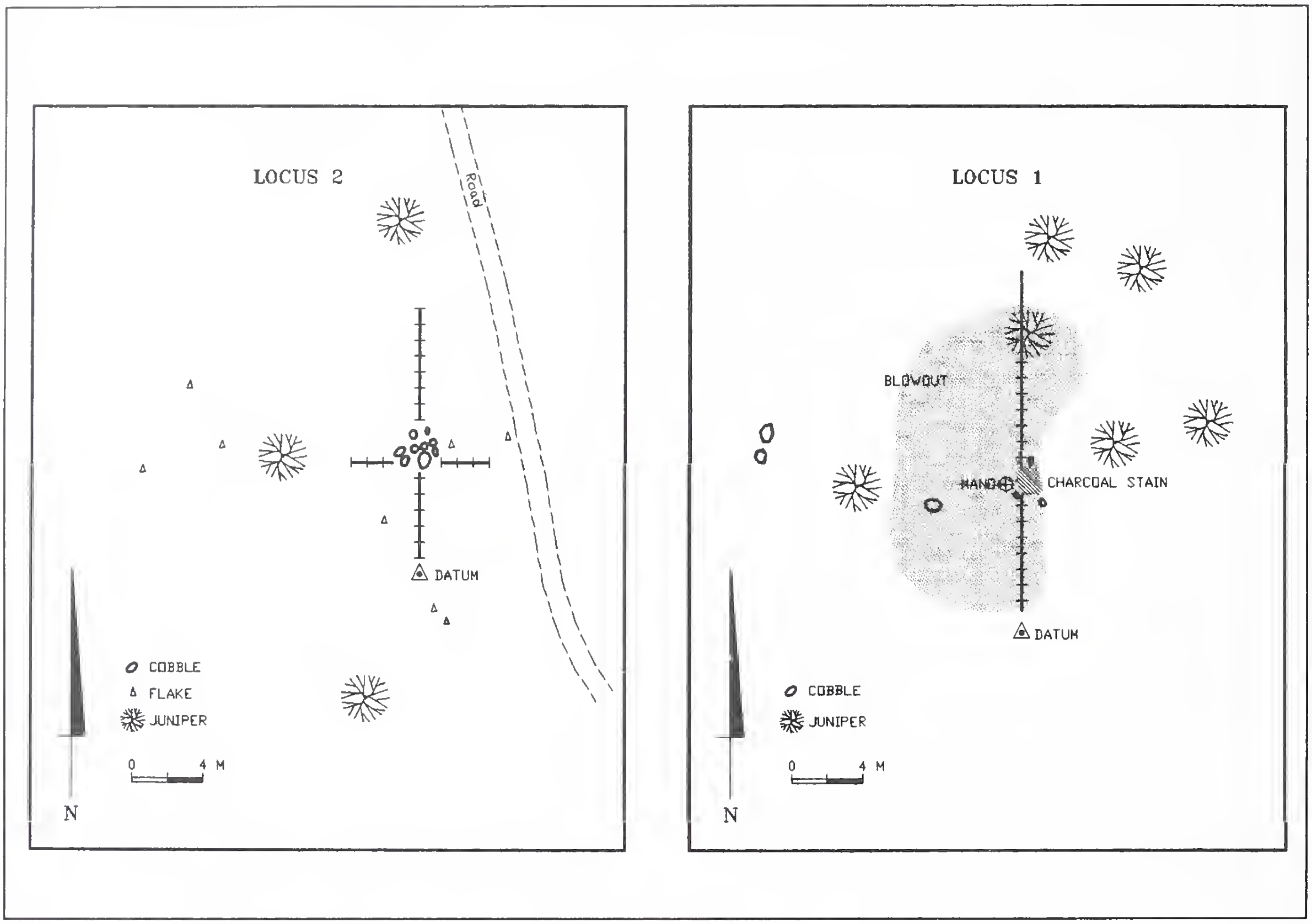
Shovel testing at Locus 2 consisted of 24 tests in two transects oriented north-south and east-west, and intersecting at the burned rock concentration 7 m. north of Datum 2. One flake was found at the Datum 2 test; another was encountered in the test 13 m. north of Datum 2. No subsurface stains, charcoal, or features were encountered, and no samples were collected.

Comments

Interpretation of Site FA 1-10, as with FA 1-9, is difficult. The available data indicate only that activities involving hot-rock processing or using stone-lined hearths were carried out, that ground stone was used, and that knapping may have occurred concurrently. This reconstruction is consistent with interpretation of these sites as representing one or more Archaic, Anasazi, or Navajo ephemeral processing stations, traveler's campsites, or foraging/hunting camps. Donaldson suggests that the absence of charcoal in the ash-stained floatation sample may indicate long weathering and consequent destruction of the contents of a probable hearth. The absence of animal or plant food remains may be the result of either post-depositional loss or genuine absence of processing and consumption detritus.



Map 5-4. Site FA 1-9 is a sparse burned rock, shipped stone, and ground stone scatter with several concentrations.



Map 5-5. The two Loci of Site FA 1-10.

FA 2-6

Site FA 2-6 is composed of two subsites or proveniences, which are respectively an aceramic lithic scatter (FA 2-6A) and a sherd and lithic scatter with associated hearth or midden deposits (FA 2-6B). The site was assigned the Laboratory of Anthropology number LA 33734.

Location

The site is located in the Farmington Glade drainage on the northwest flank of Hood Mesa, overlooking Brown Spring and Chokecherry Canyon, in Township 30N, Range 13W, Section 24. The site is set on a gentle northwest slope of a west-trending ridge at an elevation of 5,880 ft. (1,790 m.). The ridgecrest hilltop 700 m. to the east is occupied by Site FA 2-7. The ridge overlooks a broad, alluviated portion of the Glade. The site is situated in pinyon-juniper woodland with sparse Mormon tea, yucca, and grass cover over sandy pebble soils and is probably somewhat deflated, as minor erosional rills are prominent in site field maps and photographs.

Survey Description

The site was characterized on survey as a scatter of quartzite flakes and core remnants in a rill; no ceramics were observed. The site was judged to have limited potential as it was partly eroded; it was thought to be a single-use chipping station.

Efforts to relocate the site tag during the testing phase were unsuccessful, but a site having the reported characteristics was located in the area, as was a previously unreported site, located 70 m. to the east and consisting of a lithic, sherd, and tool scatter and a hearth. These two sites were designated as Sites FA 2-6A and FA 2-6B, respectively. Both were tested.

Table 5-4. FA 2-6A, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	0	0	18	-	No
2	1	4	65		B	No
3	1	14	292	9-20	-	Yes
4	1	11	229	20-25	-	Yes
5	1	20	157	18	-	Yes
6	1	6	203	12-19	-	Yes
7	1	17	200	14-18	-	Yes
8	1	27	199	20	-	Yes

Key: B-Bone

Testing Procedures

Actual testing was carried out on May 3, 1982. Testing of Site FA 2-6A consisted of installing a datum, inspecting the site and flagging artifacts, compass-and-pace mapping, collecting of all surface flagged artifacts, and installing eight shovel tests. Fill from shovel tests was screened through 1/4-in. mesh. Testing of Site FA 2-6B followed similar procedures, except that only two shovel tests were made and one formal 0.5 by 0.5 m. test pit was dug. Fill was screened.

Surface Description

Surface inspection of the sites revealed that Site FA 2-6A was indeed an aceramic lithic scatter possibly representing the reduction of only one or a few quartzite cobbles (Map 5-6). Site FA 2-6B proved to be a more complex site with ceramics, debitage, and at least one probable hearth (Map 5-7). Surface artifacts recovered from FA 2-6A consisted of 32 flakes. A core lying between the two sites was collected; it was of a quartzite matching the materials found on FA 2-6A. The surface assemblage from FA 2-6B produced 4 flakes, 1 core, 1 chopper, 1 cobble tool, and 17 Mancos Corrugated sherds from a single vessel (Raish, this volume). An additional flake and chopper were found between the two sites and were collected as part of FA 2-6B.

Subsurface Testing

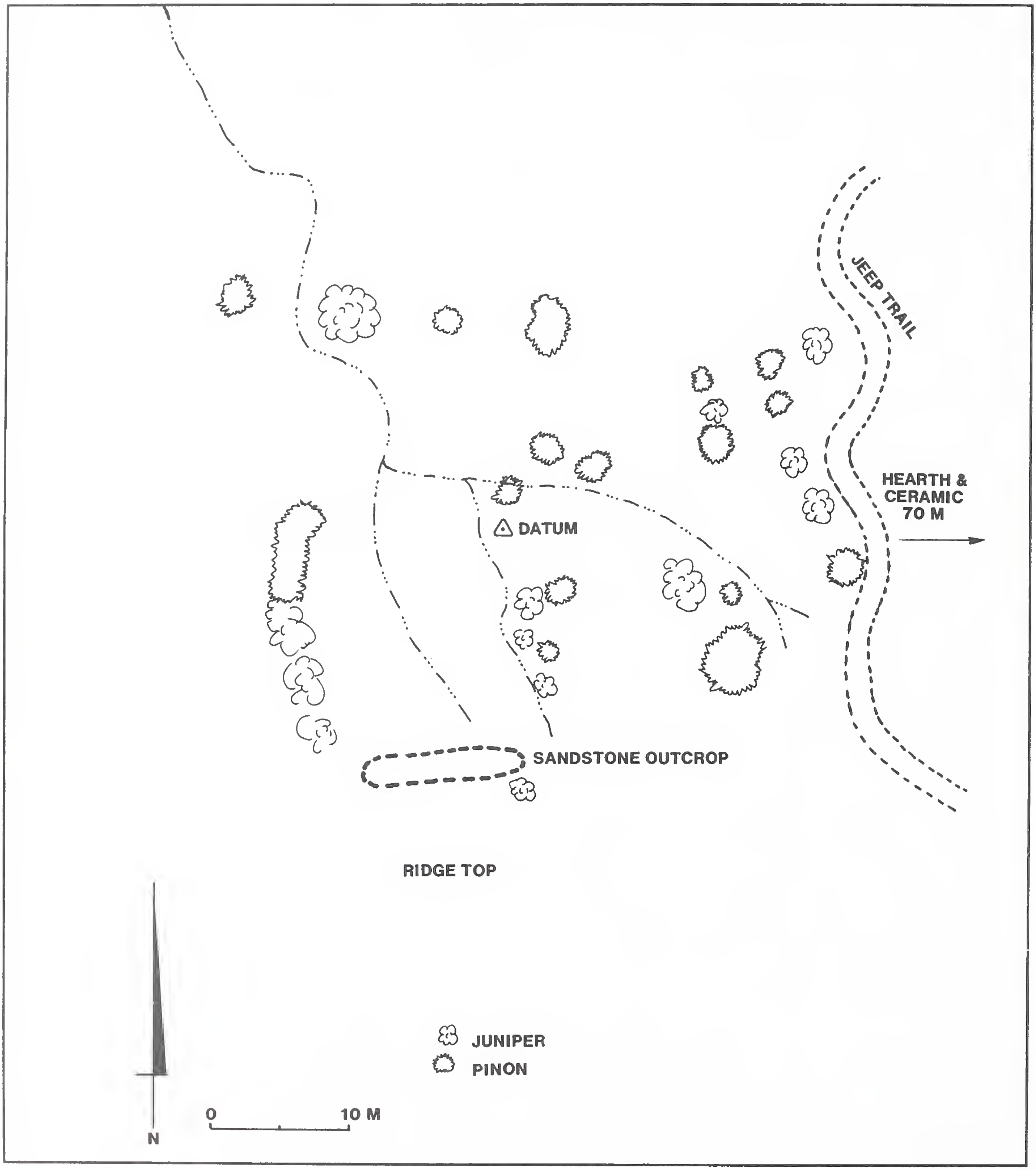
Shovel testing at FA 2-6A was directed toward determining the stratigraphy and assessing the depositional context of surface lithics. Eight tests were dug (Table 5-4). None yielded artifacts or charcoal. The tests indicated generally shallow gravelly or sandy soil layers over yellow sandstone bedrock, with clay lenses indicating either old deposition or decomposed shale bedrock members. Bedrock was typically encountered at 20 cm. depth.

Two shovel tests were installed at 2-6B (Table 5-5). The first indicated 40 cm. of sand over bedrock. The second was placed to test a possible small hearth; no stains were encountered in 33 cm. of excavation, but probing indicated a thin (2-3 cm.) stained lens lay at the surface just adjacent to the shovel test. Neither test recovered artifacts.

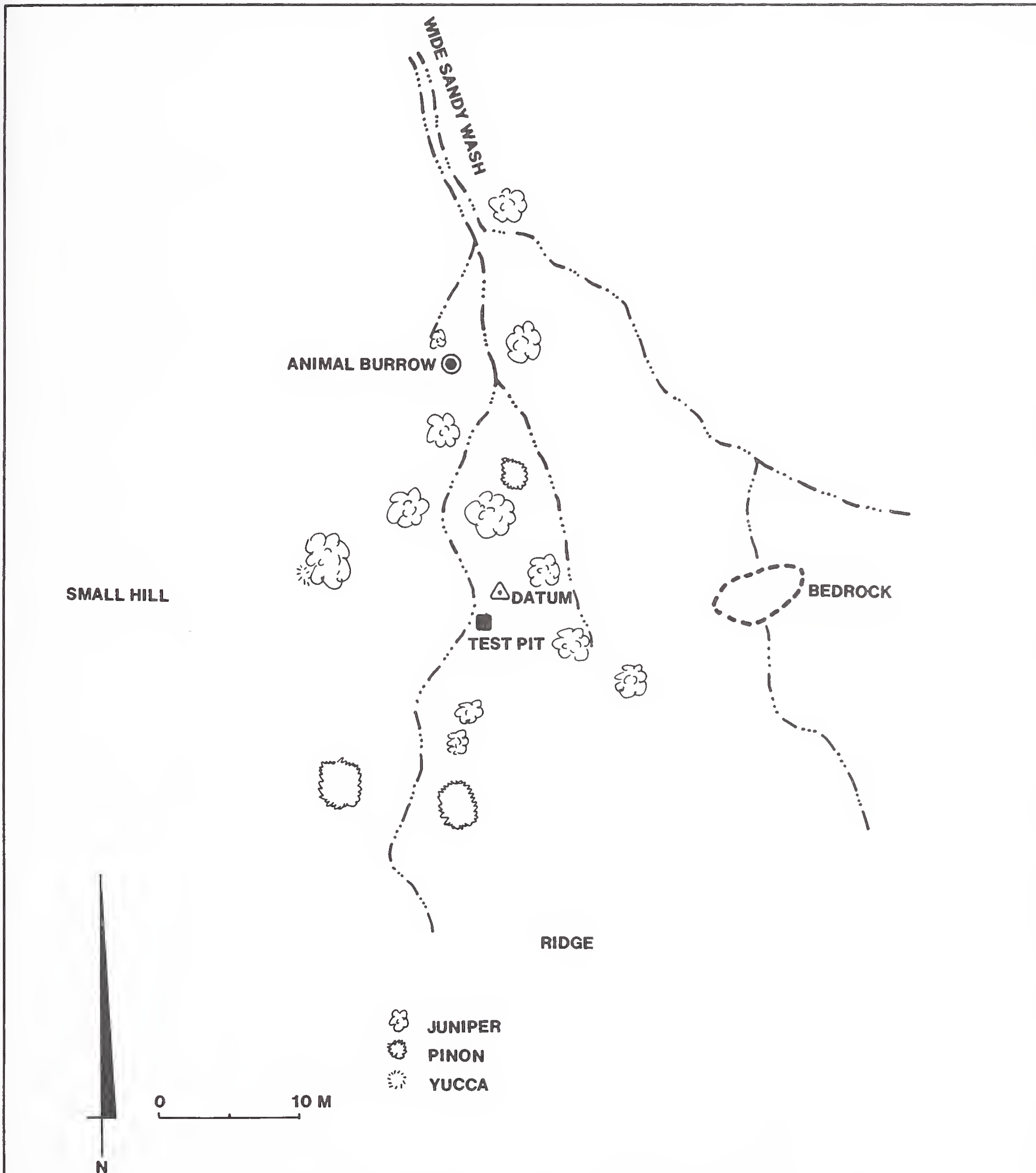
A larger probable hearth at FA 2-6B was partially excavated as a 0.5 by 0.5 m. test pit in two artificial levels (Fig. 5-5). Defining the FA 2-6B datum as 100N/100E, the unit was placed with its northeast corner at 98N/98E. Excluding the loose surface sand (Stratum 1), the entire unit was filled with an ash-stained sand (Stratum 2) down to bedrock, which was encountered at 13-15

Table 5-5. FA 2-6B, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	10	245	40	-	Yes
2	1	2	160	33	-	?



Map 5-6. Site FA 26A is an aceramic lithic scatter.



Map 5-7. FA 2-6B is a sherd and lithic scatter with associated hearth or midden deposits.

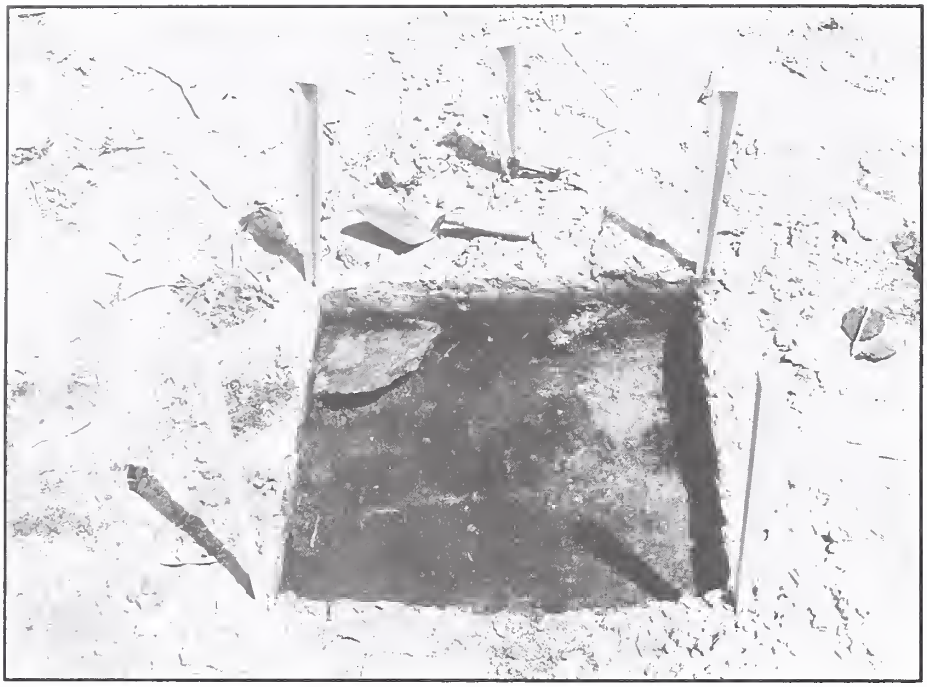


Figure 5-5. Site FA 2-6B test pit.

cm. Although areas of mottled or oxidized sand were encountered, it is unclear that any edge of the ashy stratum was defined, although the feature may have been a hearth. Recovered in the unit were burned rocks, charcoal, a floatation sample, and two pollen samples. Also recovered were fragmented bits of pottery probably pertaining to the shattered Mancos Corrugated vessel found at the surface and perhaps indicating failure of the pot during cooking (Helene Warren, ceramic analysis notes).

Analyzed Samples

Samples analyzed from FA 2-6B included experimentally refired pottery (Raish, this volume), radiocarbon, and floatation (Donaldson, this volume). Refiring indicated that the vessel, which refired to red-yellow, was more likely to have been made from Animas or San Juan clays than from La Plata clay, which tends to fire to buff colors. Radiocarbon analysis indicated a date of 1950 ± 140 B.P. (TX-4928, 375 B.C. to 330 A.D. with midpoint at 23 B.C. according to the Klein et al. [1982] 95% confidence tables), which is inconsistent with the ceramic association. Floatation recovered no macrobotanical remains; Donaldson suggests that the association of Stratum 2 with bedrock may have concentrated moisture and hastened decomposition of macrobotanical remains. If she is correct, then any unburned bone would also have been lost, as may have also been the case with pollen.

Comments

The association of sherd fragments (possibly indicating cooking pot failure) with Stratum 2 of the FA 2-6B test may indicate either that the associated and much earlier radiocarbon date was incorrect or else that the burned deposit was mixed. The lack of a determinable feature boundary or shape suggests that superimposed, mixed, or redeposited hearth contents could be represented at FA 2-6B. These could include a BMII occupation, as suggested by the radiocarbon date.

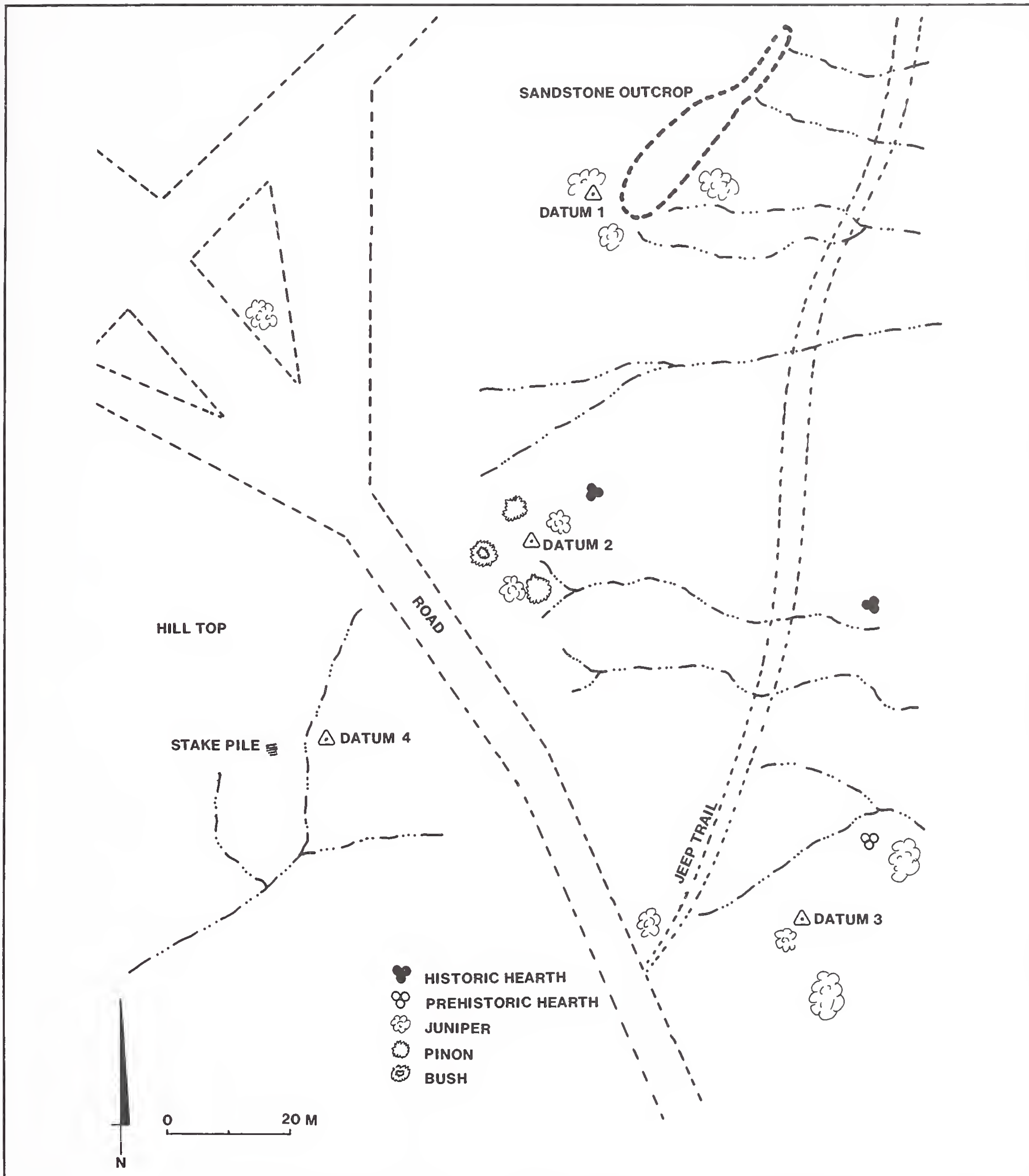
FA 2-6A can be interpreted only as a possible single-component chipping station; FA 2-6B can be viewed as a PII/PIII cooking location with associated but undated use of rough lithic tools and debitage, possibly pertaining either to an earlier Archaic occupation of the site or to the pot-cooking episode of occupation.

FA 2-7

Site FA 2-7 is a sherd, lithic, and burned rock scatter with PIII diagnostic items, possibly PII and PIV diagnostic items, and high frequencies of large cores and heavy cutting tools. It was assigned the Laboratory of Anthropology number LA 33735.

Location

The site is situated on a knoll at the highest point of a ridge at an elevation of 5,905 ft. (1,800 m.). Sites FA 2-6 (700 m. west) and FA 2-8 (700 m. east) are also situated on the ridge. It commands an overview of the southern crest of Hood Mesa and of most of the lower reaches of the Rio Animas and the Farmington Glade. The view from the ridge is obscured by the low pinyon, juniper, and Mormon tea scrub. Ground vegetation is sparse, exposing the coppice and sheet aeolian sand deposits capping the knoll.



Map 5-8. Site FA 2-7 is a sherd, lithic, and burned rock scatter with PIII diagnostic items, possibly PII and PIV diagnostic items and high frequencies of large cores and heavy cutting tools.

Survey Description

The site was reported on survey as an extensive (6000 sq. m.) area, lying near a crossing of improved two-track roads which had substantially disturbed the site. The site was described as a lithic, sherd, and burned rock scatter; it contained an exposed and possibly intrusive dog burial. Due to the sheet sand substrate, potential for buried features was judged to be high despite the disturbance and possible deflation noted. A B/w and a probable Jeddito sherd were collected.

Testing Procedures

The site was tested on April 9, April 12-13, and April 26, 1982. Testing consisted of installing four datum points, inspecting the site and flagging artifacts at close intervals, mapping the site with paced measurements and compass directions, surface collection of all flagged artifacts, installing 19 shovel tests, and excavating a probable hearth, in a 1 by 1 m. test pit.

Surface Description

Surface inspection revealed that the site consisted (Map 5-8) of (a) two historic hearths lying north and east of Datum 2, (b) a historic trash dump lying 30 m. south of Datum 3, (c) a prehistoric hearth lying 15 m. northeast of Datum 3, (d) a cairn containing a modern dog burial lying 10 m. west of Datum 4, (e) 13 sherds scattered across the north and central portions of the site, and (f) a generalized lithic scatter. The scatter contained high frequencies of cores (n=20) as compared to debitage (approximately 75 items), 4 pecked cobbles, and 10 formal tools, including an ax and two possible ground stone fragments. Graded roads had cut through and across the northwest portions of the site, and a two-track road crossed the eastern site area from north to south. Minor arroyos and rills were present in the northeast, central, and southwest site areas. Historic use was indicated by trash scatters (glass, porcelain, metal), hearths, and the animal burial.

Table 5-6. FA 2-7, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	10	20	15	-	Yes
2	1	20	20	40	2D	No
3	1	14	352	29	2D	Yes
4	1	25	310	50	-	No
5	1	30	60	15	-	Yes
6	1	18	130	30	-	Yes
7	2	0	0	7	-	Yes
8	2	8	8	12	C	Yes
9	2	21	14	15	-	Yes
10	2	18	356	12	-	Yes
11	2	33	335	15	P	Yes
12	2	40	330	50	C	Yes
13	2	18	152	20	-	Yes
14	3	0	0	35	-	Yes
15	3	12	10	40	-	Yes
16	3	20	235	15	-	Yes
17	4	0	0	20	D	Yes
18	4	13	135	30	-	Yes
19	4	25	345	60	C	No

Key: D-Debitage, C-Charcoal, P-Pollen

Subsurface Testing

Shovel testing was directed toward determining whether the site had intact deposits (Table 5-6). Six shovel tests were placed near Datum 1. Shovel Test 2 produced a flake at 0-20 cm. and another at 20-30 cm. in reddish sand. Pollen samples were collected from Level 2 and from the more pale-hued sand encountered at 40-50 cm. depth. Shovel Test 3 produced a flake near the surface and a second flake at 20-29 cm., where sandstone bedrock was encountered. The other four tests were culturally sterile. No ash or charcoal were located. Tests indicated bedrock at depths from 10 cm. to deeper than 50 cm., with different soil sequences in every test.

Shovel testing at Datum 2 included seven tests (numbers 7-13). Shovel Test 8 produced charcoal but encountered bedrock at 12 cm. Test 12 encountered charcoal as well, with bedrock at 50 cm. A subsurface pollen sample was collected from Test 11. Other tests detected no staining, and all tests were barren of subsurface artifacts. Bedrock was shallow (7-20 cm.) except in Test 12; fill was yellow or surface sand except in 12, where a red sand layer is reported.

Shovel testing at Datum 3 entailed 3 pits (numbers 14-16). All were sterile, with variable sand fill and decomposing bedrock appearing at 15-40 cm. depth.

Shovel testing at Datum 4 entailed three pits (numbers 17-19). A flake was found in the upper 10 cm. of Test 17, with bedrock at 20 cm. Test 19 produced charcoal in red sand in the upper 20 cm. with no bedrock at 60 cm. depth. Test 18 was sterile and reached bedrock at 30 cm. depth.

A single test pit of 1 by 1 m. was excavated to evaluate the suspected hearth northeast of Datum 3, with its northwest corner 10 m. north and 8 m. east of the datum point. The surface of the unit was littered with apparently burned red pebbles. Decomposed, mottled yellow bedrock was encountered in Level 2, at a depth of 10-20 cm. below the southwest (highest) corner. Level 1 fill was patchy yellow, red, and mixed red and black lenses within a mottled matrix, all of which gave way rapidly with depth to mixed dark gray clay and yellow sand or rotted bedrock. Pollen samples were collected from the reddened lenses thought to represent possible hearths. Excavation notes suggest that only one stratum, the dark clay layer, could be recognized, but that perhaps two hearths had been intruded into the stratum and subsequently truncated and mixed by erosion.

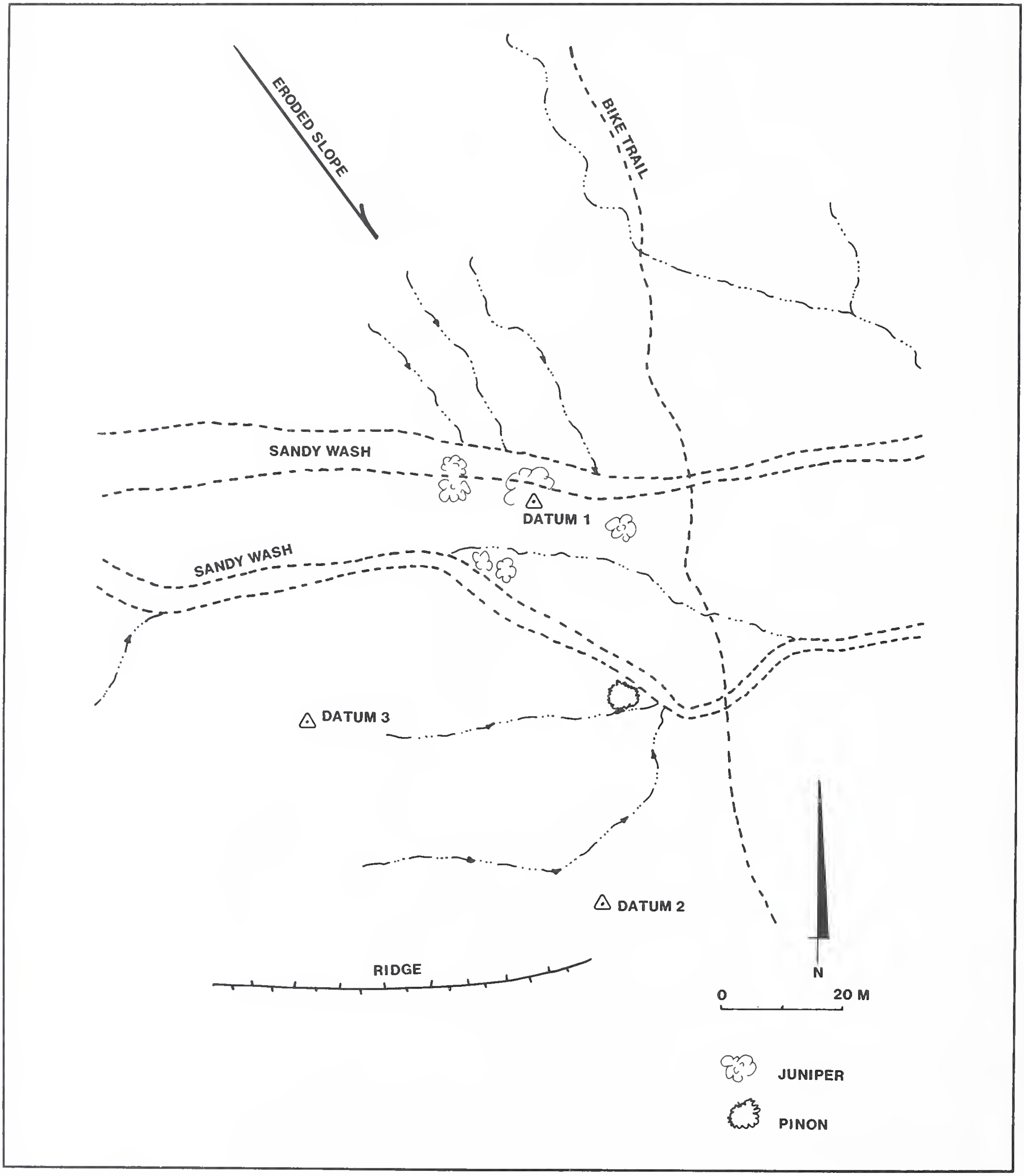
Analyzed Samples

Samples analyzed from Site FA 2-7 include 15 sherds from surface contexts and a combined pollen sample drawn from the two that were collected in test pit 110N/108E. Pollen analysis indicated high pine counts but no definite cultural pollen (Scott Cummings, this volume). Scott Cummings suggests that the high pine counts may indicate the use as fuel of pine branches which died in the springtime. Ceramics included one sherd each of Mancos B/w, McElmo B/w, and Jeddito B/y (jar), two sherds of undifferentiated whiteware, three sherds of Jeddito Plain (one or more jars, possibly matching the B/y), and seven sherds of Mesa Verde B/w. Perhaps five jars and one bowl are represented in all. A single Mesa Verde B/w sherd was refired experimentally to red-yellow.

Comments

It appears clear that Site FA 2-7 had multiple occupations spanning minimally the time range of A.D. 1150-1300 and possibly the range of A.D. 950-1625. The absence of strictly utility wares and the presence of axes, choppers, and numerous cores on this site and on Site FA 2-8 (see below) may indicate activities relating to short-range travel, wood gathering, or ceremonial occupancy. It should be noted that FA 2-6, FA 2-7 and FA 2-8 lie on probably the easiest and shortest route between the lower Rio Animas and the Farmington Glade, and that FA 2-7 is located on the highest point lying directly on that route.

Figure 5-6. Site FA 2-8.



Map 5-9. Site FA 2-8.

FA 2-8

Site FA 2-8 is a multicomponent Archaic, San Juan Anasazi, and Navajo Reservoir Anasazi site with multiple occupation loci. It was assigned the Laboratory of Anthropology number LA 33736.

Location

The site is located in Township 30N, Range 13W, Section 24, on a gentle ridge on the eastern slope of Hood Mesa The ridge forms the southern drainage of Hood Arroyo and rises to a crest 700 m. to the west, at the Animas/Farmington Glade divide, on the knoll on which Site FA 2-7 is located. Site FA 2-8, at an elevation of 5,830 ft. (1,777 m.) overlooks the lower Animas Valley. Vegetation is moderately dense pinyon-juniper scrub, with little ground cover on the eroded, sandy slope that is cut by a shallow arroyo and several smaller rills (Fig. 5-6).

Survey Description

The site was characterized on survey as a large (4800 sq. m.), dispersed scatter of lithics and ground stone, with ceramics present at the north end in an eroded area containing extensive charcoal staining. Ceramics included early Navajo Reservoir brownware types, of which four specimens were collected. Two grooved axes were noted. Lithics included high proportions of cherts and chalcedonies, as well as the more common quartzites, suggesting an early or specialized occupation. The site was estimated to be 40% intact, and potentially to contain subsurface deposits.

Testing Procedures

The site was tested between March 31 and April 9, 1982. Testing consisted of installing four datum points, and inspecting the site and flagging artifacts at 5 m. transect intervals over an area of roughly 20,000 sq. m. centered on the site area reported by the survey crew. This was followed by compass-and-pace mapping and collecting of all surface artifacts. Artifacts in the concentration just west of Datum 1 were collected in 1 sq. m. grid proveniences, because of their high density; all other collected artifacts were provenienced by compass directions and pace measurements. The area outside the site perimeter was informally shovel-tested, at least 13 shovel tests were dug in the vicinities of Datums 2 and 3, and four 1 sq. m. test pits were excavated in probable features (Map 5-9). All test pit fill was screened.

Surface Description

Surface examination revealed a dense concentration of lithics and BMIII/PI brownware ceramics 10 m. west of Datum 1, surrounded by a sparse scatter lying between two wide, sandy washes. At Datum 2, 65 m. to the south, lay a second dense concentration, consisting only of lithics and including an ax (apparently one of the two reported on survey). Southeast of Datum 2 at a distance of 40-50 m. lay a sparse lithic scatter. Datum 3, 45 m. northwest of Datum 2 and 50 m. southwest of Datum 1, was the center of a third dense concentration of artifacts, again having no ceramic component. The sparse scatter around Datum 1 continued north of the washes at least past Datum 4, 65 m. north-northwest of Datum 1. The concentration at Datum 1 was associated with ash and charcoal-stained soil and was labeled Feature 1. A second ashy area lay 7 m. west of Feature 1 and was named Feature 2. A third stain lying 20 m. southeast of Feature 1 was called Feature 3. A fourth stain lying 6 m. southwest of Datum 3 was named Feature 4.

Surface artifact counts included a tool, a ground stone item, a core, three flakes, and approximately ten sherds for the area outside the collection grid at Datum 1. The collection grid, 20 sq. m. in area, contained 88 sherds, 19 lithics, 1 bone, and 1 projectile point. The area around Datum 2 contained three ground stone artifacts, 1 core, 1 grooved ax, and approximately 50 debitage pieces. The Datum 3 collection included 2 cores and some 25 pieces of debitage. The Datum 4 collections produced only two flakes and two choppers.

Subsurface Testing

Shovel-testing notes have apparently been lost, but specimen catalogs and field maps indicate that five shovel tests were dug in the wash walls 20 m. north of Datum 2, another four tests were dug in rill heads 30 m. southeast of Datum 2, and four shovel tests were dug in rill and wash walls near Datum 3. Two of the tests southeast of Datum 2 produced one flake each. An undetermined number of additional tests were dug outside the perimeter of the site to establish boundaries.

Single test pits were placed in each of the four recognized features. In each case, the 1 by 1 m. unit was tied to the nearest datum, which was in each case denoted as 100N/100E. Excavation proceeded in 10 cm. arbitrary levels. Clear natural strata or subfeatures were excavated separately, where possible, as they were encountered, or else were pedestaled and excavated separately after their extent was established.

The test pit at Feature 1, located in the densest portion of the ash, lithic, and ceramic scatter, was set with its northwest corner at 100N/90E relative to Datum 1 (Fig. 5-7). The loose, ashy surface sand, designated Level 1A, was removed; it yielded 41 sherds and 9 flakes. The compacted lower portion of the level, Level 1B, was

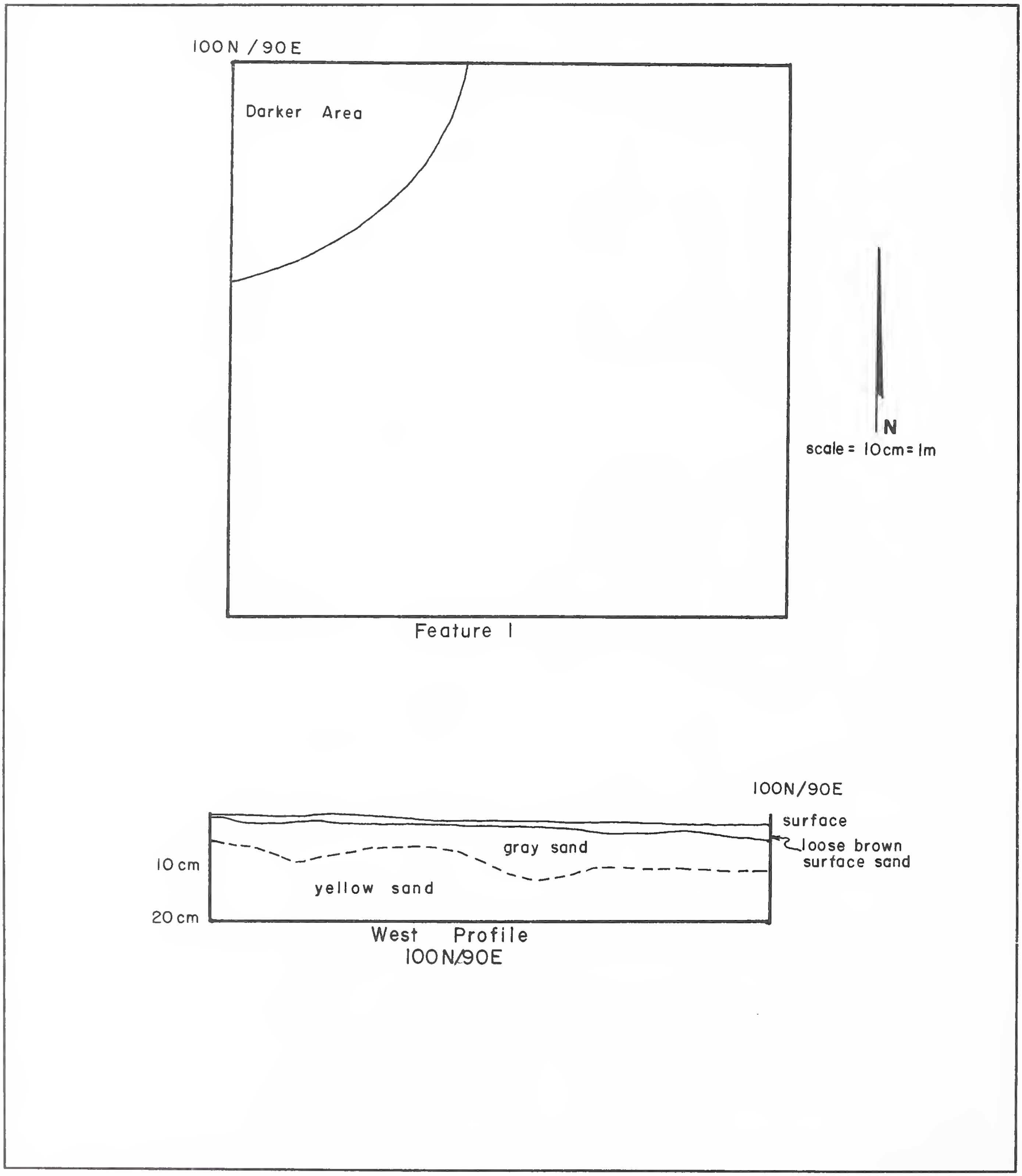


Figure 5-7. Site FA 2-8, Feature 1.

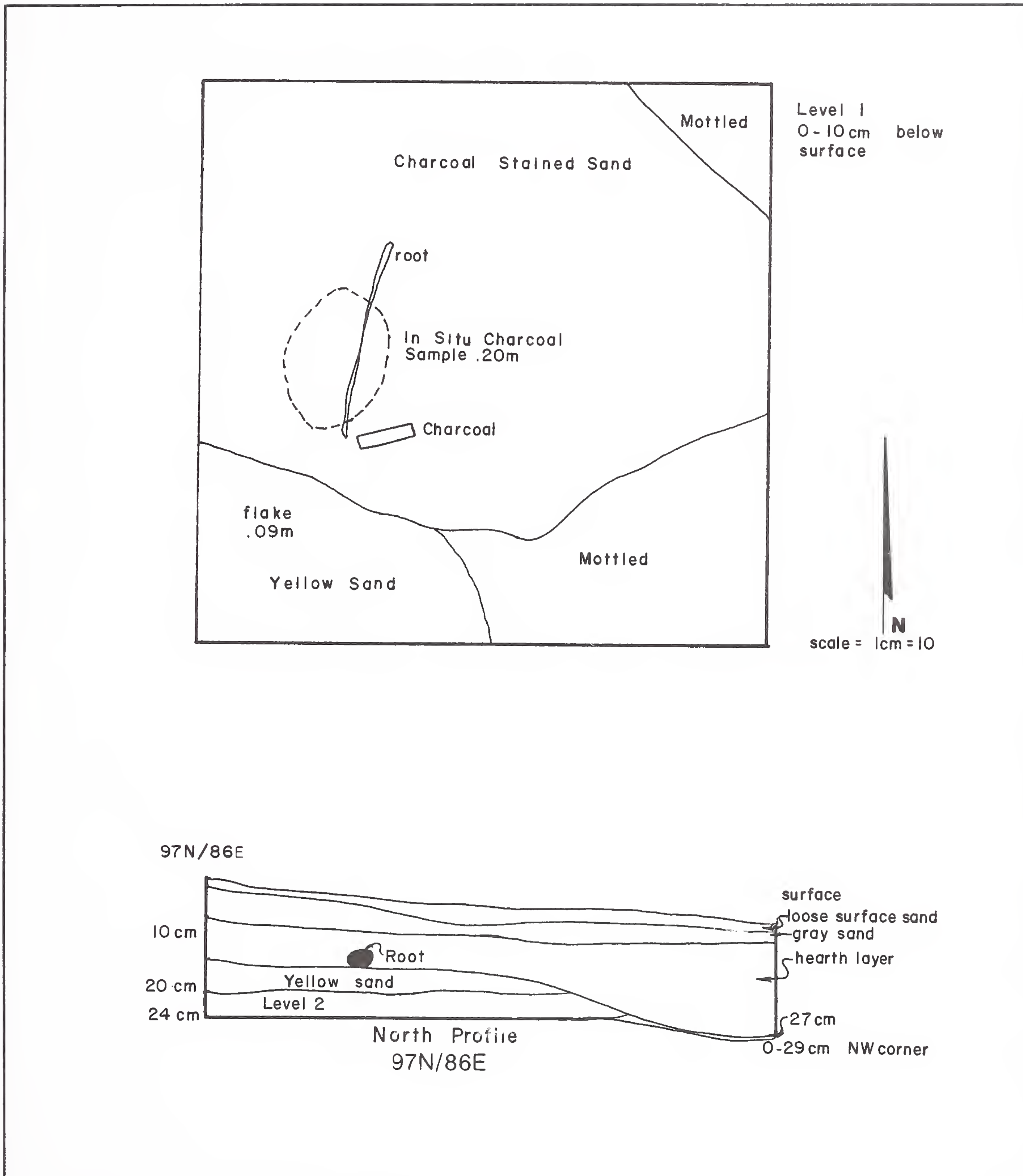


Figure 5-8. Site FA 2-8, Feature 2.

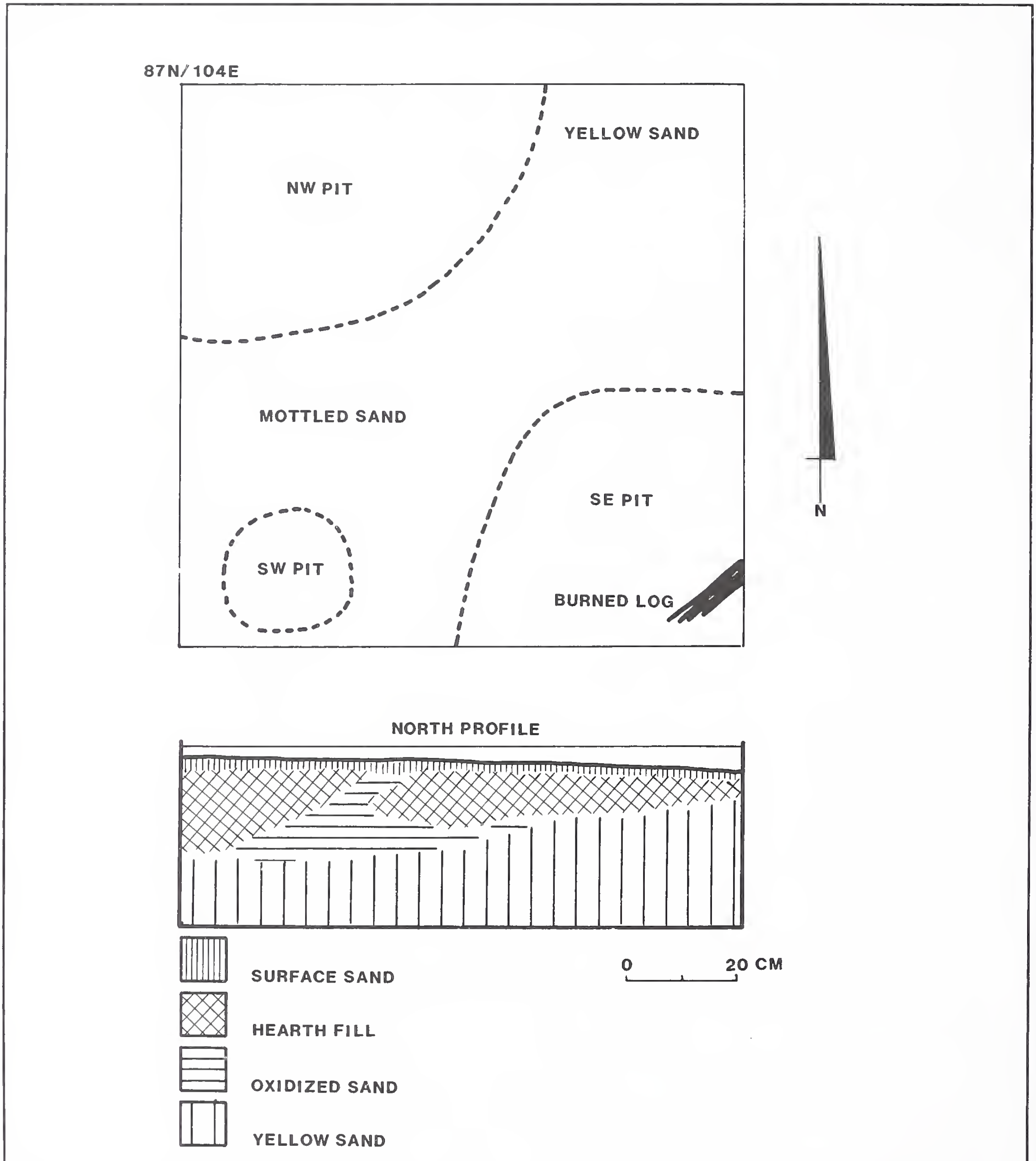


Figure 5-9. Site FA 2-8, Feature 3.

removed; it contained 51 sherds and 7 flakes. The level fill of Level 1B was mottled ashy soil with intermixed charcoal and yellow sand; a darker stain was noticed in the northwest corner of the unit. A charcoal sample and juniper seeds were collected. A heat spall from a rock was noted. Level 2 produced ten sherds, three flakes, and a charcoal sample. At 15 cm., the stained fill (Stratum 1) disappeared; it was replaced by an almost-sterile yellow sand (Stratum 2) which contained one of the flakes near its upper limit. As Stratum 2 appeared to be sterile, excavation was ended. No feature boundaries were discovered in excavation.

The test pit at Feature 2, located to evaluate a suspected hearth, was set with its northwest corner at 97N/86E relative to Datum 1. Surface stripping revealed no artifacts in the loose ashy soil. Completion of Level 1, dug into the natural slope, recovered a sherd, a flake in situ, and an apparent hearth perimeter (Fig. 5-8), suggesting that the unit had been centered on a hearth so as to cut its south boundary. The south side of the unit exhibited yellow sand fill (Stratum 2) with the flake as sole contents, while the remainder of the unit was filled with variably disturbed hearth contents (Stratum 1), including charcoal, ash, the sherd, and a burned rock. Charcoal samples were taken both from the general fill and from a dense charcoal concentration in the west-central portion of the unit. Floatation and pollen samples were collected. Level 2 further defined the hearth boundary; the hearth fill and the surrounding Stratum 2 substrate were excavated separately. The hearth fill produced a bone bead, three bone pieces, burned rock, charcoal samples in place and picked from the screen, a floatation sample and a pollen sample. The substrate produced two flakes. As Stratum 2 appeared to be sterile except for trampled debitage, excavation was ended when the hearth bottom had been defined at 29 cm. depth. Hearth Feature 2 was determined to be a basin hearth at least 12 cm. deep and perhaps 1 m. or less in diameter. Surrounding and capping the hearth is an ashy layer perhaps 2 m. in diameter which represents either disturbed hearth fill or an ash and charcoal halo that developed as the basin hearth was repeatedly used or as it was cleaned.

The test pit at Feature 3, located to test a second suspected hearth with associated, burned petrified wood chunks, was placed with its northwest corner at 87N/104E relative to Datum 1. Stripping of loose surface soil recovered a bone and several possible debitage fragments, while excavation of the remainder of Level 1 produced five flakes, two bone fragments, and floatation, pollen, and charcoal samples. At 10 cm. depth, two or three hearths were visible (Fig. 5-9); they were indicated by dark fill and charcoal in the unit's southwest quadrant (Subfeature 3-1), dark and red-burned soil in the northwest quadrant (Subfeature 3-3), and red sand in the southeast quadrant (Subfeature 3-2). The northeast quadrant appeared to have a light sand substrate (Stratum 2) underlying the mixed red, yellow, ash, and charcoal fill of the level (Stratum 1). Excavation of Level 2 was conducted separately in the substrate, the northwest hearth, and the southwest hearth. As substrate excavation proceeded, a third hearth containing a possible dendrochronological specimen was disclosed, as suspected, under the reddened sand in the southeast quadrant. The northwest pit produced lithic debitage and a small, triple-notched projectile point, while the southeast pit produced burned pebbles only. The southwest pit was sterile except for charcoal. The portion of Stratum 2 excavated in this level had no cultural inclusions. The western pits disappeared in Level 3, but a dendrochronological sample was collected from the southeast subfeature, SF3-2. It was associated with a hammerstone, a flake, burned rock, and two potsherds. The excavation was closed at 32 cm., having defined (a) an earlier southeastern hearth (SF3-2) with an irregular form, capped by burned sand, and with a diameter of perhaps 50 cm. and a depth of at least 20 cm.; (b) a small southwestern hearth remnant (SF3-1) a few centimeters deep and of undetermined diameter, perhaps associated with the southeastern hearth; (c) a northwestern basin hearth (SF3-3), perhaps 70 cm. in diameter and 15 cm. deep and suggested in profile as being stratigraphically superimposed over the southern subfeatures; and (d) perhaps a north-central hearth remnant (SF3-4?) recognized in profile as prior to Subfeature 3-3 or representing an earlier use of that subfeature. The disturbed fill of SF3-4 seems to have capped SF3-2 and thus possibly also postdates Subfeatures 3-1 and 3-2.

The test pit at Feature 4, located to test a surface charcoal stain, was placed with its northwest corner at 97N/96E relative to Datum 3. On the surface, a small stain was visible within the unit. As the loose fill was stripped, the stain was revealed as a circular basin hearth, clearly defined as being 60 cm. in diameter and exhibiting no evidence of disturbance (Fig. 5-10). The hearth fill (Stratum 1) and the yellow sand substrate (Stratum 2) were excavated separately in artificial levels. No artifacts were found in either stratum. Pollen and floatation samples were collected. The basin was found to be 12-15 cm. in depth and oval to circular in outline. Feature 4 was undisturbed except for surface mixing, as reddened sand was visible all along the contact between Stratum 1 and Stratum 2 in the basin floor.

Analyzed Samples

Special analyses for the Site FA 2-8 samples include ceramic, radiocarbon, dendrochronological, pollen, bone, and macrobotanical analyses. These will be presented by provenience.

The area around Datum 1 exhibited a probable multicomponent occupation. Mancos Corrugated sherds indicate an A.D. 900-1200 occupation, while the Navajo Reservoir brownwares from the sherd concentration at Feature 1 suggest an occupation in the range of A.D. 600-950 with overlap rather unlikely. Feature 1 dated by radiocarbon at 1480 ± 280 B.P. (TX-4919, A.D. 15 to A.D. 1035 with midpoint at A.D. 525 according to the Klein et al. [1982] 95% confidence tables). At least one Rosa Brown, one Piedra Brown, and one Mancos Corrugated jar are represented. The only botanical data are unburned juniper seeds, possibly modern. No bone was recovered from Feature 1.

The Feature 2 hearth produced a single Piedra Brown jar sherd (A.D. 700-950) from Level 1. Biotic remains included only burned and unburned juniper and a little pinyon wood (Donaldson, this volume); a burned jackrabbit metatarsal, which displayed artifactual or digestive (fecal) polish, from Level 1; and burned packrat hind limb fragments from Level 2. The bone items exhibited intense leaching after burning, suggesting that considerable groundwater had flowed through the hearth area (Bertram, this volume). Radiocarbon dates were 1250 ± 70 B.P. (TX-4920, A.D. 620 to A.D. 890 with midpoint at A.D. 755 according to the Klein et al. [1982] 95% confidence tables) from Level 1 and 1150 ± 80 B.P. (TX-4921, A.D. 630 to A.D. 1046 with midpoint at A.D. 838 according to the Klein et al. [1982] 95% confidence tables) and 580 + 55 B.P. (DIC-3003, 1285 A.D. to 1415 A.D. with midpoint at 1350 A.D. according to the Klein et al. [1982] 95% confidence tables) from Level 2. The Level 2 dates, which do not overlap, are from a single sample, suggesting that one or both are incorrect.

The Feature 3 hearth complex includes material from the surface and near-surface context as well as material associated with Subfeatures 3-2 (southeast feature) and 3-3 (northwest feature). Near-surface materials included (a) burned and unburned pinyon and juniper parts (Donaldson, this volume); (b) a pollen spectrum very high in cheno-ams and low-spine composites indicating greens preparation and/or seed parching (Scott Cummings, this volume); (c) burned and leached fragments of unidentifiable and large mammals (Bertram, this volume); and (d) a radiocarbon date of 2030 ± 80 B.P. (TX-4922, 380 B.C. to A.D. 216 with midpoint at 82 B.C. according to the Klein et al. [1982] 95% confidence tables). The northwest hearth complex, Subfeature 3-3 (and possibly SF3-4) produced a projectile point referable to any time period after late BMII and a radiocarbon date of 1220 ± 70 B.P. (TX-4923, A.D. 630 to A.D. 900 with midpoint at A.D. 765 according to the Klein et al. [1982] 95% confidence tables), together with an inadequate pollen sample. It is possible that the pollen sample from the near-surface provenience should be referred to this subfeature. The data from Subfeature 3-2 include two sherds of a Piedra Brown jar, microbotanical and macrobotanical juniper parts (Donaldson, this volume; Scott Cummings, this volume), and a tree-ring specimen found to be undatable.

The data from Feature 4 include juniper parts (Donaldson, this volume) and a pollen spectrum including much Artemisia, high-spine composites, corn, and trace amounts of beeweed. No artifacts were associated, but a date of 1760 ± 70 B.P. (TX-4924, A.D. 55 to A.D. 415 with midpoint at A.D. 235 according to the Klein et al. [1982] 95% confidence tables) was obtained.

Comments

Early sites exhibiting ceramics such as those reported from the Navajo Reservoir sequence have previously been only rarely reported outside the Upper San Juan drainage, but sites such as FA 2-8 are increasingly being reported from the Middle San Juan, Animas, and La Plata drainages (Eddy 1966; Warren 1986; David Hill, personal communication 1987). These sites deserve special attention, as the apparently precocious Formative of the Navajo Reservoir still stands as the earliest well-known semisedentary occupation in the San Juan Basin. Because of their local uniqueness and well-understood early development, it is important that we make special efforts to understand the relationship of the people who used these brownwares to the somewhat later and more general developmental mainstream of grayware-using Anasazi groups. Whether a specific brownware occupation is Los Pinos BMII or late Piedra PII, it may provide data helpful in determining whether the brownware technology is linked to an adaptation or group different from that followed by grayware-using folk.

In this context, the data from Site FA 2-8 are suggestive but unsatisfying. The problem of radiocarbon inconsistency noted above suggests either that some form of contamination had occurred, with apparently single thermal events actually being mixtures of old and young charcoal, or else that samples were incorrectly calibrated. A resolution of this problem should be aggressively pursued. Pending resolution, the complex stratigraphy of Feature 3, the corn associated with Feature 4, and the artifacts associated with Features 1 and 2 cannot be properly analyzed. Speculation on the component structure of this site, which probably pertains mostly to one or a few Rosa-Piedra occupations, is premature. At this time, the site can be described only as a multicomponent Archaic and Anasazi campsite with uncertain associations among artifacts, subfeatures, and chronometry, and exhibiting both brown- and grayware traditions.

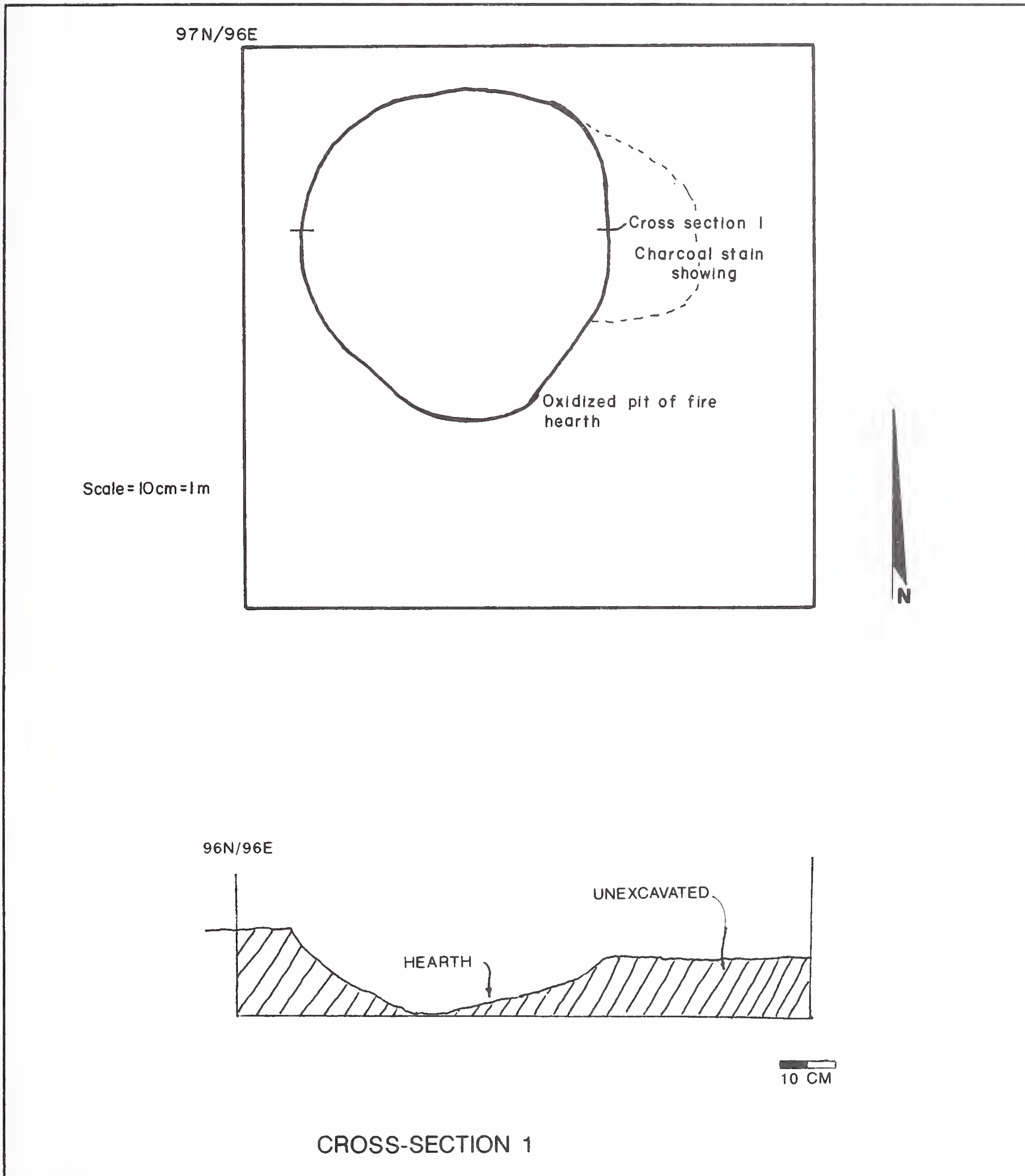


Figure 5-10. Site FA 2-8, Feature 4.

FA 2-9

Site FA 2-9 is a sparsely distributed lithic scatter having an unusual number of large tools. It was assigned the Laboratory of Anthropology number LA 33737.

Location

This site is situated on a northwesterly slope of Hood Mesa overlooking the lower narrows of Farmington Glade, at an elevation of 5,660 ft. (1,725 m.), in Township 30N, Range 13W, Section 27. Sites FA 5-1, FA 5-2, and FA 5-3 are situated just upslope to the south and southeast. Within a kilometer to the east, high buttes on the Hood Mesa crest overlook most of the lower Animas, La Plata, Glade, and San Juan valleys. The site is partially vegetated by mixed juniper/Mormon tea and shrub/grass stands, the latter growing in hummocks and clumps with eroded soil exposed between clumps. Bedrock outcrops protrude extensively all around the site and in small patches within the site area (Map 5-10).

Survey Description

On survey, the site was characterized as a 600 sq. m. lithic scatter eroding downslope. It was judged to have little research potential.

Testing Procedures

The site was tested on April 16, 1982. Testing consisted of installing a single datum, inspecting the site at close transect intervals while flagging artifacts, mapping the site using paced measurements and compass directions, collecting all flagged artifacts within 60 m. of the datum, and installing 11 shovel tests.

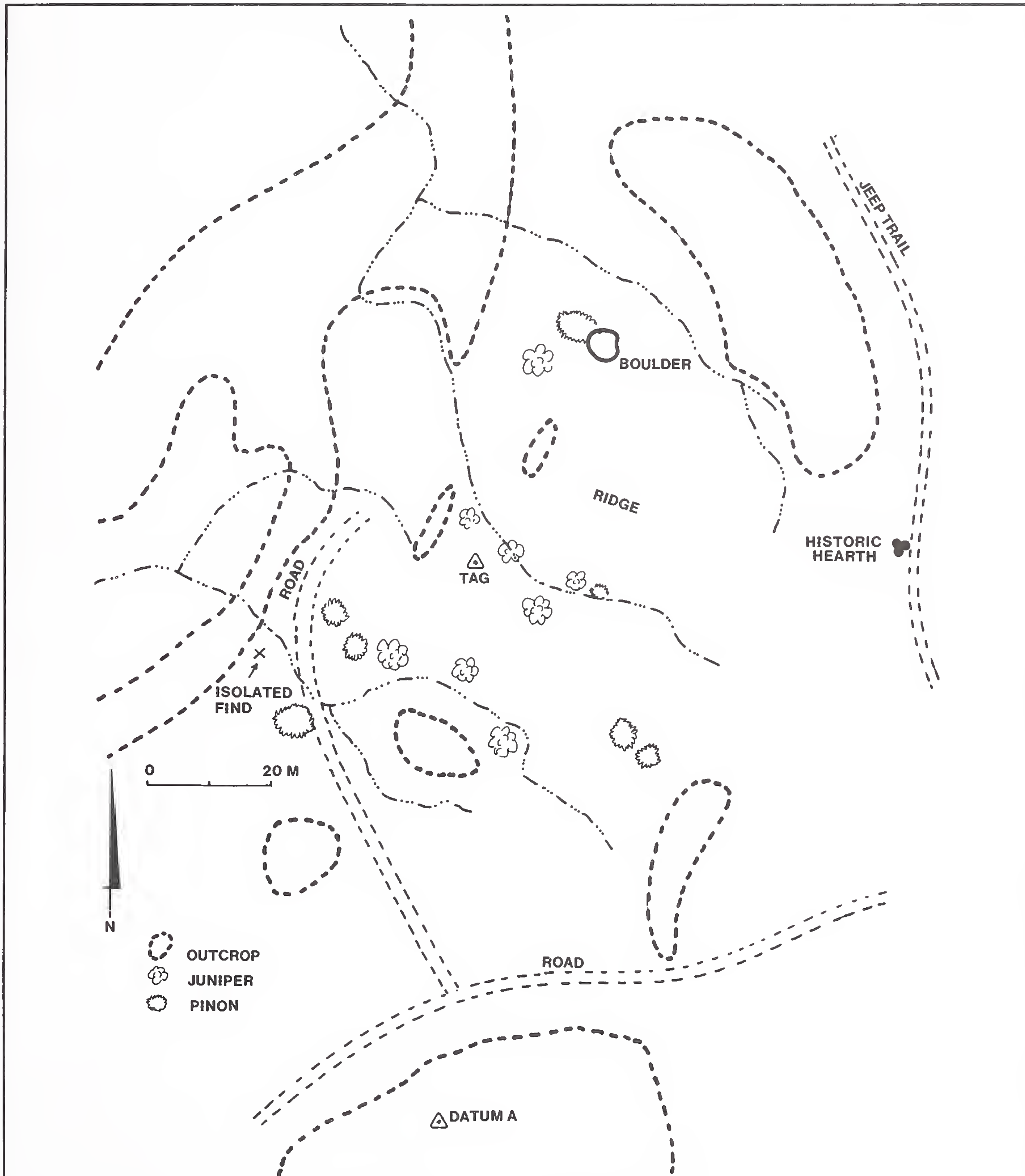
Surface Description

On surface inspection, the site was found to be a dispersed scatter of lithics, densest (1 item/sq. m.) near the datum and becoming very sparse (0.001 item/sq. m.) at a distance of 30 m. in any direction. Artifacts at a distance beyond 50 m. from datum were generally not recorded. The concentration area, treated here as a 25-m.-diameter circle centered at datum, contained roughly 50 debitage items, 4 cores, 2 cores with ground stone use, 8 cores with tool use, 1 core with both ground stone and other tool use, 3 tools, and 1 ground stone piece with tool use. An undiagnostic grayware sherd was also collected. To the north, items lying beyond 25 m. from datum included seven flakes, two cores, and a hearth 55 m. to the northeast. To the east, five flakes and a core were encountered beyond 25 m. from datum. To the south, eight flakes were recovered. To the west, only two flakes were noted, but a possible hearth was noted at 47 m. from datum. The main datum for Site FA 5-2 was only 90 m. south of the FA 2-9 datum, suggesting that the distinction between the two sites may be a function of exposure, erosion, and disturbance. The sites have been disturbed by a road that cuts along the west side of FA 2-9 and that intersects a second east-west road running between the two sites.

Table 5-7. FA 2-9, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	47	295	27	C	Yes
2	1	22	328	15	-	Yes
3	1	5	180	23	-	Yes
4	1	6	225	14	-	Yes
5	1	15	175	0-10	-	Yes
6	1	17	143	15	-	Yes
7	1	18	73	20	-	Yes
8	1	53	29	14	C?	Yes
9	1	35	85	25	-	Yes
10	1	40	100	16	P	Yes
11	1	30	152	20	-	Yes

Key: C-Charcoal, P-Pollen



Map 5-10. Site FA 2-9.

Subsurface Testing

Subsurface testing was limited to 11 shovel tests (Table 5-7), none of which yielded artifacts. Two shovel tests in the two possible hearths (Tests 1 and 8) encountered charcoal specks in a sand matrix. Test 1 reached sterile sand at 7 cm. and bedrock at 27 cm. below surface. Test 8 was ended at a large cobble lag or decomposed conglomerate deposit at 14 cm. below surface. The other 9 tests encountered either intact or decomposed sandstone bedrock at 10-25 cm. below surface. A pollen sample was collected from Test 10 at 10 cm. below surface, but it was not analyzed. Burned tree stumps were noted near both possible hearths, suggesting that the apparent hearths may actually have been the result of recent burns.

Comments

It appears likely that Site FA 2-9 should be considered a collection of small occupations rather than a single occupation with any internal spatial patterning. Evidence for this interpretation includes the obvious redeposition at both Site FA 2-9 and Site FA 5-2, probably a continuation of the same scatter. The rather common evidence from this site both of recycling of cores, tools, and ground stone for new functions and also of complex tool use jointly suggest the same interpretation. This is that Site FA 2-9 is a special-purpose locus with multiple, low-intensity occupations relating to the production and on-site use of large rough chopping, scraping, and grinding tools. Temporal assessment of the primary period(s) of occupation can be made through material, technological, spatial, and functional analyses of the lithic assemblage.

FA 2-10

Site FA 2-10 is a lithic scatter with modern disturbance. It was assigned the Laboratory of Anthropology number LA 33738.

Location

The site is located at the southern end of Hood Mesa at the head of an unnamed arroyo draining south to the San Juan-Animas confluence, in Township 30N, Range 13W, Section 26. The site lies on a southerly slope below and just south of the high buttes marking the south end of Hood Mesa at an elevation of 5,750 ft. (1,753 m.). It overlooks the valley slopes and lower mesa buttes on which the northern portion of the city of Farmington has been built. Vegetation is open pinyon-juniper woodland, with a sparse understory of Mormon tea and other shrubs and bunch grasses on largely unvegetated and eroding sand and cobble soils.

Survey Description

On survey, the site was characterized as an eroded lithic scatter (with a single sherd) extending over an area of 900 sq. m. and displaying little potential for deposition.

Testing Procedures

The site was tested on February 1 and 2, 1982. Procedures included establishing a single datum point, inspecting the site and flagging artifacts within 100 m. of datum at 5-10 m. intervals, compass-and-pace mapping and collecting all flagged artifacts, and installing five shovel tests. Fill from the shovel tests was screened.

Surface Description

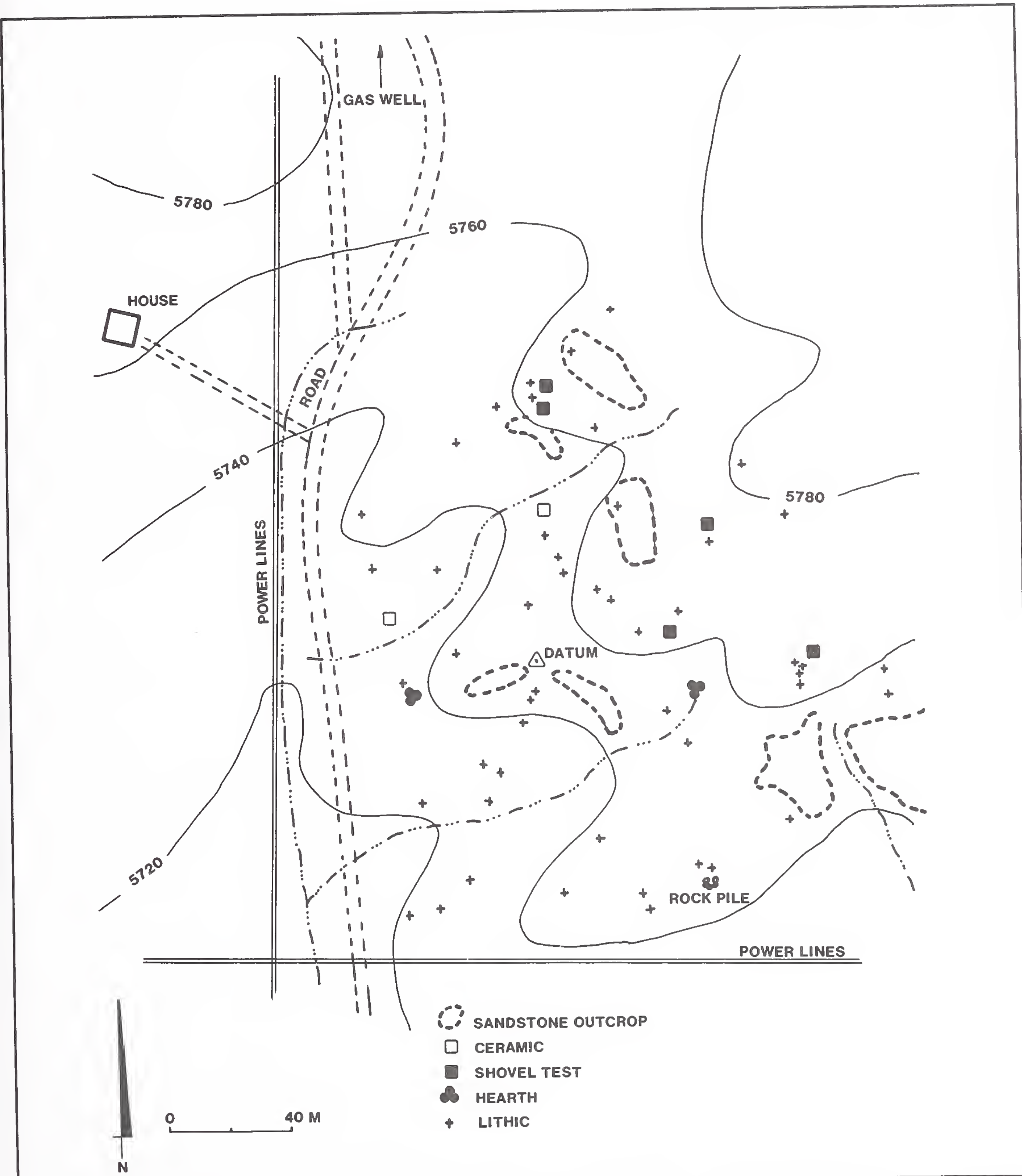
Surface examination of the site (Map 5-11) revealed two modern hearths located 45 m. west and 50 m. east of the datum, a U-shaped pile of tabular stones located 90 m. southeast of the datum, two notched axes or hoes located 45 m. and 84 m. south of the datum, and a rather uniform scatter of lithic artifacts extending roughly 100 m. north, east, and south, and 60 m. west of datum. Artifacts not already listed, which were found in this scatter, included roughly 60 flakes, 3 sherds, 5 cores, 1 ground stone piece, and 2 bottle fragments.

Subsurface Testing

Shovel tests were located north and east of the datum (Table 5-8). Two of these either encountered subsurface artifacts, or were placed adjacent to surface artifacts (a core and flakes). It is thought that the latter interpretation of the field notes is more likely, in which case all five shovel tests were sterile. Bedrock north of the datum was encountered at 19-23 cm. below surface. Bedrock east of the datum seems to have been reached at 14-17 cm., where it underlay a mixed sand and gravel matrix.

Comments

The only chronometric indications from Site FA 2-10 are an undifferentiated plainware and two undifferentiated whiteware sherds, indicating site use sometime after BMIII times and presumably prior to PIV, or roughly A.D. 700-1350. The U-shaped alignment (dimensions unknown) was unfortunately not associated with artifacts or other diagnostic resources. It could represent a windbreak or an Anasazi shrine. No interpretation is offered for the site, although it is consistent in setting and assemblage with use as a quarry, a hunting overlook, a wood or plant-gathering camp, or a shrine station. Comparative lithic analysis of the debitage and of the two axes/hoes might clarify interpretation.



Map 5-11. Site FA 2-10.

Table 5-8. FA 2-10, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	88	88	17	-	?
2	1	44	77	17	-	?
3	1	70	52	14	-	Yes
4	1	87	2	19	*	Yes
5	1	82	1	23.5	*	Yes

* Notes indicate only five tests; Field Specimen log indicates seven tests, but two (FS 5 & 6) appear to be surface next to Shovel Tests 4 & 5.

FA 2-11

Site FA 2-11 is an extensive and only partially recorded lithic scatter having a PII-PIII component, and possibly other components as well. It was assigned the Laboratory of Anthropology number LA 33739.

Location

The site is located 1 km. northeast of Site FA 2-10 in the Animas drainage at the head of Porter Arroyo. It is situated on a southeasterly slope, roughly 100 m. downslope from the crest of Hood Mesa, at an elevation of 5,790 ft. (1,765 m.), overlooking the lowermost Animas valley. The slope is sandy, partially dominated by weathered sandstone hoodoos and outcrops, and vegetated by sparse pinyon, juniper, and Mormon tea. Grasses are rare and the soil is mostly unstabilized. Several rills are eroding the unstabilized soils.

Survey Description

The site was described on survey as consisting of one large and three small charcoal stains associated with a lithic scatter of quartzite and basalt flakes, cores, and tools, a few chert flakes, and a Mancos B/w sherd. Structures were suspected at the stains, so further work was recommended and the potential of the site was evaluated as high.

Testing Procedures

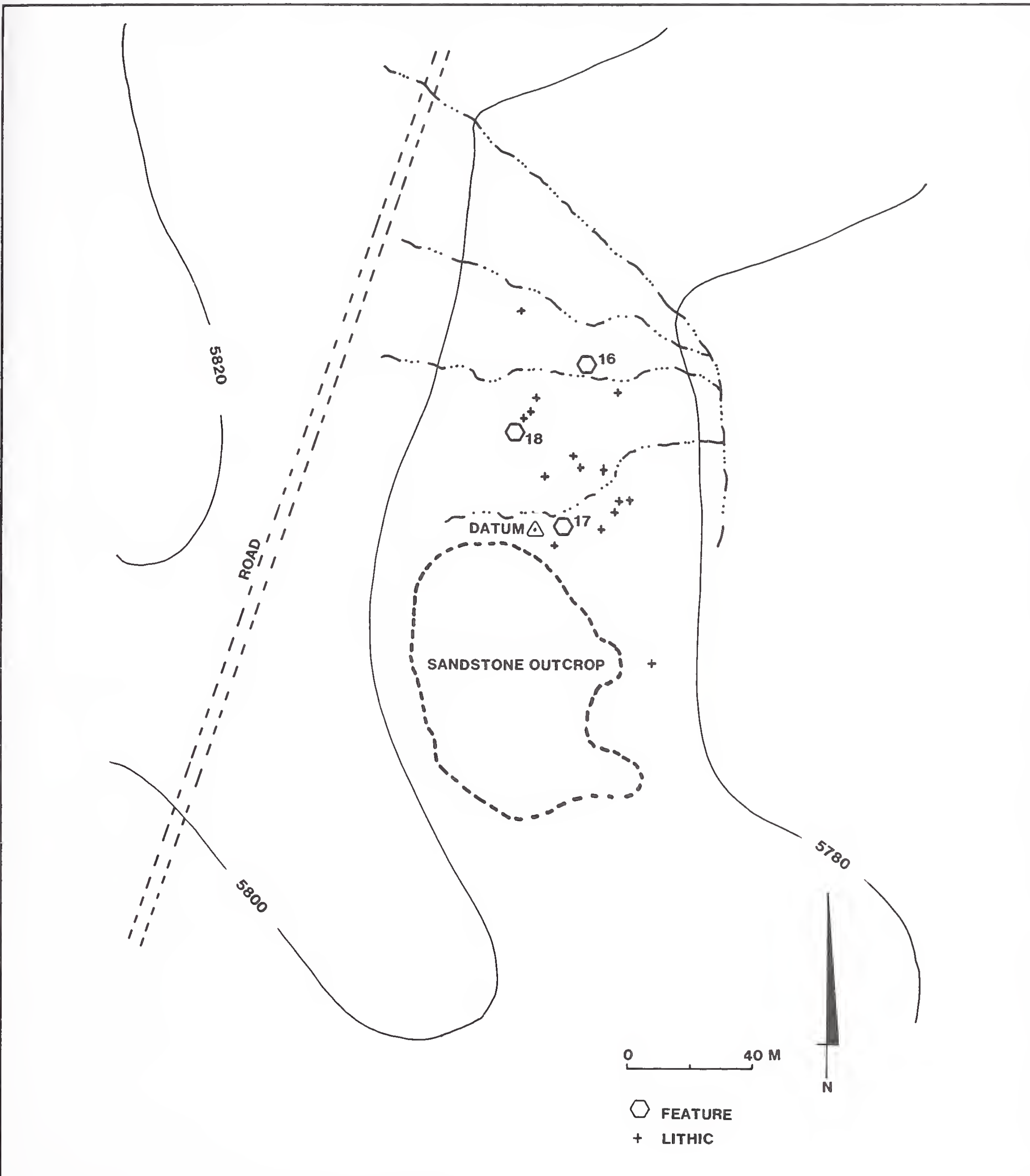
The site was tested on February 2 and 3, 1982. In the course of testing, it was determined that the site lay outside the study area; as a result, further testing was curtailed. Consequently, this description constitutes a discussion only of the mapping and surface-collection phases of the site assessment.

Testing procedures included installing a datum, close-interval transect pinflagging of all visible artifacts and features, compass-and-pace mapping, collecting of sparser areas and features in the northern site area (which constituted the total site as reported on survey), installation of a 1 by 1 m. grid over a dense concentration, and collecting the artifacts. The southern site area was never mapped or collected (Map 5-12).

Surface Description

On inspection, the site was found to consist of rather dense northern and southern scatters of artifacts. These were separated by a slickrock sandstone outcrop upslope; they seemed to be connected by a sparse continuous scatter downslope to the east. The stains reported on survey were all judged to be natural, but at least one hearth and associated lithic concentration were reported for the southern scatter, and one large and one to three small hearths with associated concentrations were noted in the northern site area. The larger hearth area was collected in meter grid units. The one well-described small hearth in the northern area was never mapped or collected. It lay at 348 degrees and 30 m. from the datum. It was reported to be associated with a scatter of basalt artifacts (C. Muceus field notes).

The general collection of the northern area produced some 20 items of debitage, 2 cores, and 1 Mancos Corrugated sherd. The grid collections over the Feature 1 stain and concentration produced 49 flakes, 1 ground stone fragment, 2 cores, and 1 small, tri-notched chert point similar to that recovered at Site FA 2-8 (Feature 3-3, Level 2). This last item was dated by radiocarbon to the eighth century A.D. (see site description for FA 2-8, above). A second point, collected 56 m. southeast of the datum, was an obsidian contracting stem (Gypsum-



Map 5-12. Site FA 2-11 is an extensive and only partially recorded lithic scatter having a PII-PIII component, and possibly other components as well.

style) triangular dartpoint with 9-10 mm. haft width; similar specimens have recently been shown to date from 1000 B.C. to A.D. 1100 (Bertram 1987).

Comments

Available data suggest that substantial features may be associated with the PII/PIII occupation. This occupation could have resulted in the deposition of the dart and arrow points. If so, the site may represent short-term reuse of a multifunctional field base camp within the upland exploitation of the Hood Mesa area; otherwise, it may include a wide temporal range of nonintensive occupations.

FA 2-12

Site FA 2-12 is a small, aceramic, lithic and burned stone scatter, which was assigned the Laboratory of Anthropology number LA 33740.

Location

The site is located in Township 30N, Range 13W, Section 33, on the eastern margin of the floor of Farmington Glade, 100 m. southwest of Site FA 2-13 (See excavation report for that site) and below the southwestern escarpment of Hood Mesa, at an elevation of 5,500 ft. (1,676 m.). The site is set on the foot of a low ridge and on the adjacent floodplain, on a generally westerly slope. The site is situated on semi-stable sands with scattered small junipers, sage, Mormon tea, and bunch grasses as the only vegetation.

Survey Description

The site was characterized on survey as an aceramic lithic scatter dominated by chert debitage and cores, with quartzite and basalt debitage and cobble manos also present. A thin biface of silicified wood, displaying stepped abrasion, was collected. The site was judged to be relatively intact in spite of disturbance by off-road vehicle trails, pipelines, and roads. Potential for subsurface deposits was judged to be good.

Testing Procedures

The site was tested on April 14, 1982. Testing consisted of installing a datum point, inspecting the site and flagging the artifacts, compass-reading and pace-measure mapping, collecting all flagged artifacts, and installing 18 shovel tests, each with an auger test placed into the exposed substrate at its bottom.

Surface Description

Surface examination revealed a lithic scatter roughly 50 m. north-south by 30 m. east-west; a small burned rock scatter lay 12 m. northwest of datum (Map 5-13). Overall density of items ranged from 1 item/2 sq. m. at the datum to 1 item/10,000 sq. m. at the periphery of the site. Collected artifacts included approximately 15 debitage pieces, 1 core, 1 hammerstone, and 2 ground stone items, in addition to the biface collected on survey.

Subsurface Testing

Testing consisted of installing a shovel/auger test at datum; four more shovel/auger tests at 5 m., 10 m., 15 m., and 20 m. from datum in each of the cardinal directions; and an eighteenth shovel/auger test at 10 m. west and 8 m. north of datum in a possible burned-rock hearth area. All shovel tests were sterile. As no comments on stratigraphy are recorded, it is assumed that only undifferentiated sand was encountered.

Comments

Current data suggest that Site FA 2-12 is related to the much richer and rather similar site, FA 2-13, just to its northeast (Schutt, this volume).

FA 2-15

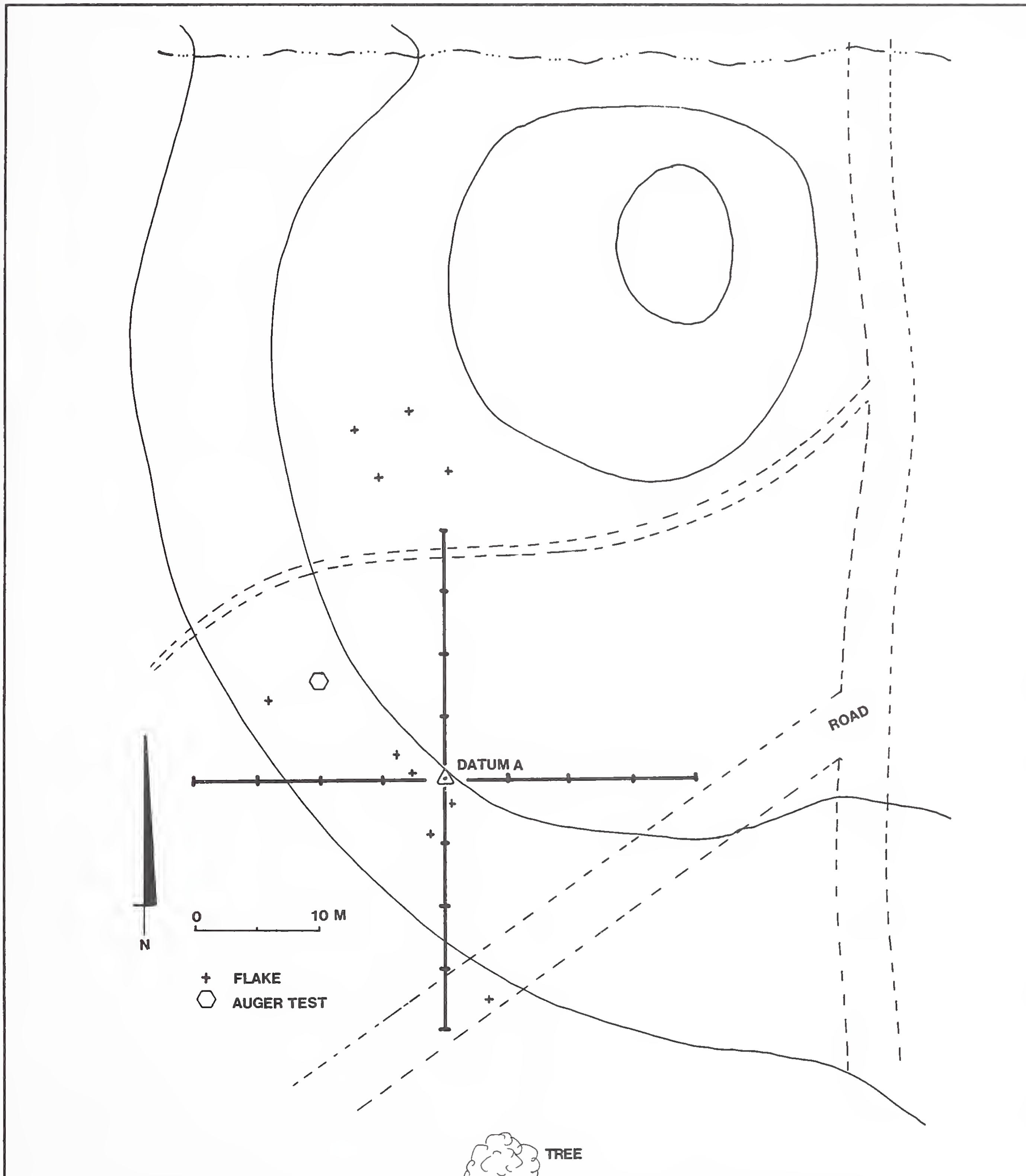
Site FA 2-15 is a lithic scatter with an associated ground stone cache. It was assigned the Laboratory of Anthropology number LA 33743.

Location

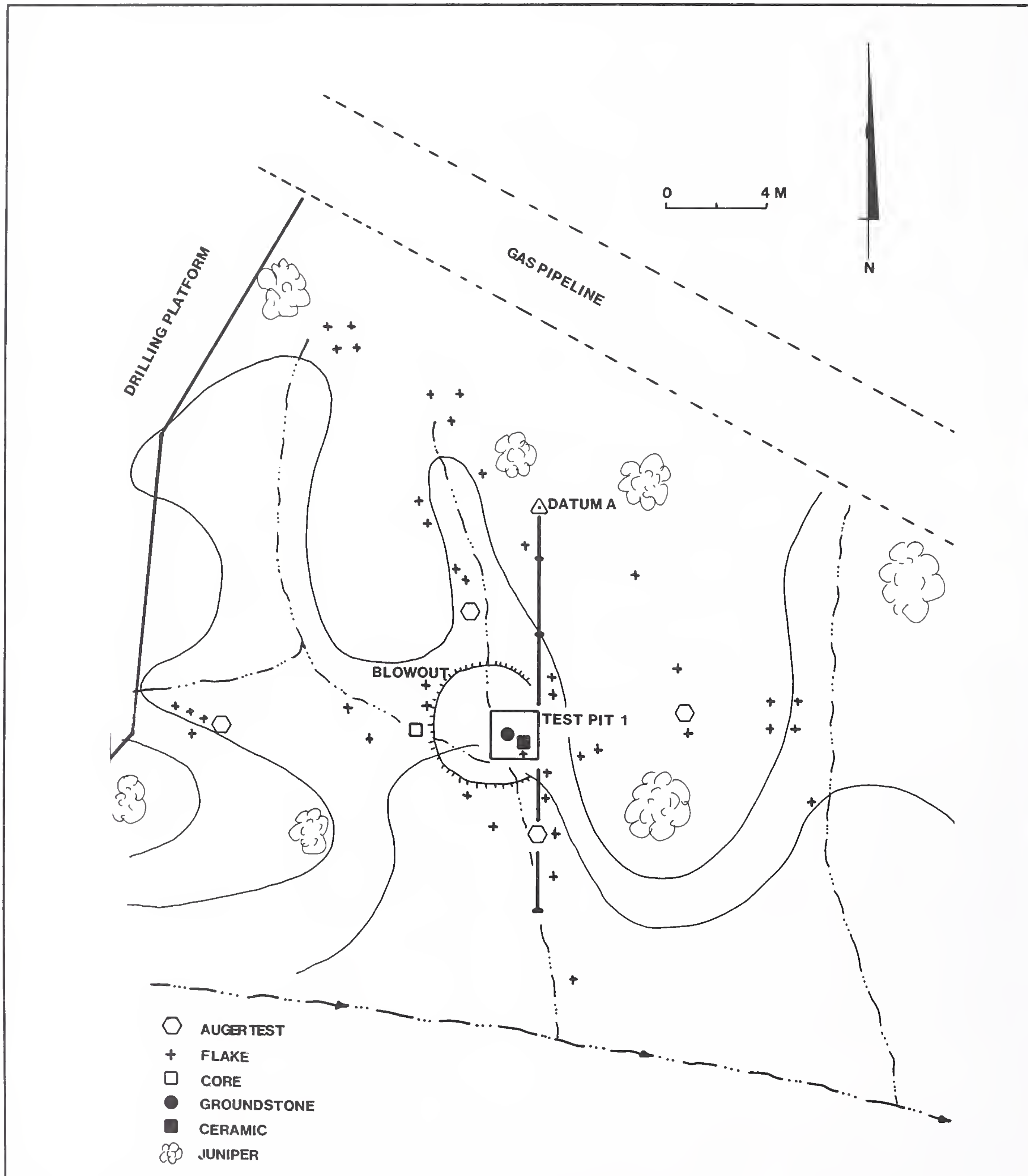
The site is located on the mesa headland separating the Animas and San Juan valleys, in the southern edge of a saddle across the drainage divide between the two rivers, in Township 29N, Range 12W, Section 18, at an elevation of 5,600 ft. (1,707 m.). The site is situated such that, within 100 m., commanding overviews of both valleys are accessible. Sites FA 2-17, FA 2-19, and FA3-6 lie roughly 800 m. away across the canyon to the southeast. The site is exposed in arroyo heads and recent disturbances cutting into the sandy soil of the saddle, which is otherwise vegetated by pinyon and juniper trees and sparse bunch grasses.

Survey Description

The site was characterized on survey as a small concentration of cobble manos and fire-cracked rock, surrounded by a scatter of debitage and utilized flakes,



Map 5-13. Site FA 2-12 is a small, aceramic, lithic and burned stone scatter.



Map 5-14. Site FA 2-15 is a lithic scatter with an associated ground stone cache.

predominantly of chert and chalcedony. Disturbances to the site, thought to lie on a stabilized dune, included headward cutting by an arroyo, construction and maintenance for a pipeline right-of-way crossing the northern site perimeter, and construction of a well-pad lying on the western site perimeter. In spite of these disturbances, the site was judged to be largely intact and to have good subsurface potential. Ths assessment was based on the abundance of surface manos and on the depth of soft soil.

Testing Procedures

The site was tested on March 24 and 25, 1982. Testing consisted of installing a datum point, inspecting the site and flagging artifacts, compass-reading and pace-measure mapping, collecting all mapped surface artifacts, collecting artifacts within a 2 by 2 m. grid of the concentration, performimg four auger tests in the site area, and excavating a single 2 by 2 m. test pit centered over the concentration. Four additional auger tests were placed in the test pit floor. Fill was screened through 1/8-in. mesh.

Surface Description

On inspection, the site was found (Map 5-14) to correspond well with the survey description, except that additional small flake clusters were discovered at 10 m. east, 12 m. west, and 10-15 m. northwest of the concentration, which was composed of approximately 15 manos and mano fragments, 8 pieces of debitage, 1 core, and 2 choppers, one of which had been used as ground stone. Outside the concentration were approximately 50 flakes and 5 additional manos or other ground stone items. No clearly diagnostic items were found.

Subsurface Testing

Auger testing was directed at locating subsurface cultural deposition. Auger tests were placed at 6 m. east, 4 m. north, 4 m. south, and 10 m. west of the concentration, but no cultural evidence was encountered.

A 4 sq. m. test pit was dug in the area of the concentration after artifacts in the concentration were piece-plotted and collected. Control for the piece-plot and excavation were based on a 2 by 2 m. square set with its northeast corner at 8 m. south and 0 m. east of the datum, with the grid oriented and measured relative to magnetic north. Approximately 20 flakes and 1 possible hammerstone were found in the loose, dry surface sand, but no artifacts were encountered in the wet, compact sand that underlay it. The test pit was excavated to a depth of 40 cm. below surface. Four additional auger tests were placed in the pit floor. None encountered cultural materials. Bedrock was reached in these auger tests at 60 cm. depth below surface. No pollen, floatation, or other nonartifactual samples were collected.

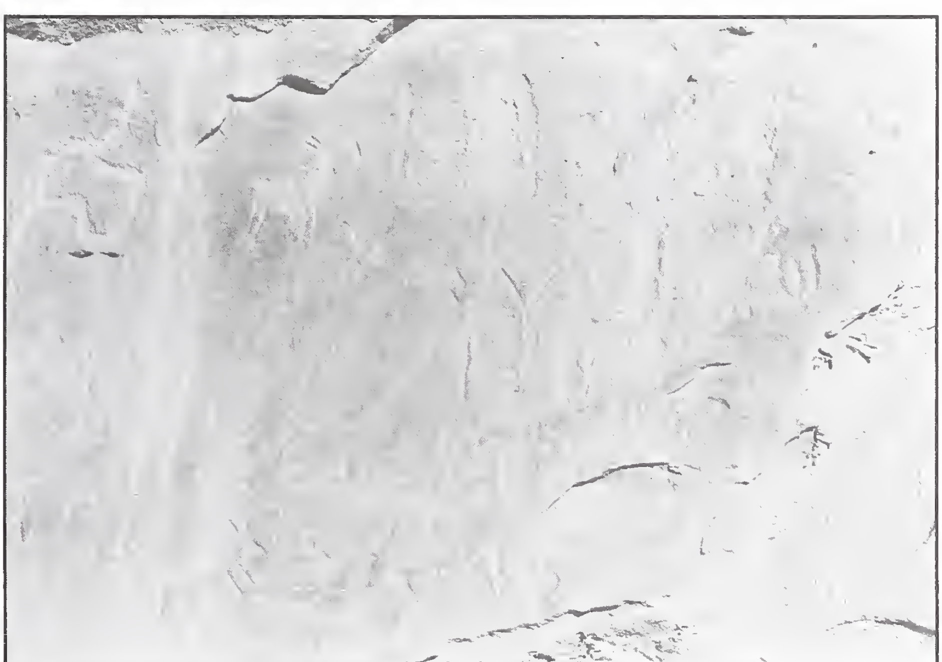


Figure 5-11. Site FA 2-16 Petroglyphs.

Comments

This site appears to have been a cache of grinding implements located within a generalized lithic scatter on unstratified sand deposits. As cobble deposits are reported in the knolls on either side of the saddle in which the site is placed, it may be that Site FA 2-15 represents a mano production and use area. The absence of metates or stone outcrops suitable for use as grinding surfaces is puzzling.

FA 2-16

Site FA 2-16 is a complex of three petroglyph panels with associated scatters and a rockshelter, all probably of Anasazi affiliation. It was assigned the Laboratory of Anthropology number LA 33744.

Location

The site is located in Township 29N, Range 12W, Section 17. It lies in the San Juan drainage, on a southern slope of the complex of deeply dissected mesas and canyons characteristic of the lowermost Rio Animas/Rio San Juan divide. Site elevation is 5,550 ft. (1,692 m.). The site's overview is limited to the talus and bluffs of an isolated mesa immediately to the south, to the intervening wash, and to a saddle or pass between small mesas 600 m. to the southeast. The saddle may have served as a game route. Vegetation is dominated by juniper and sage. Soils are sandy and generally thinly spread over sandstone slickrock, which outcrops in isolated hoodoos, benches, andbluffs surrounding the site.

Figure 5-12. Site FA 2-16 Petroglyphs.

Survey Description

On survey, the site was reported as a complex of three petroglyph groups associated with a rockshelter. The only artifacts noted were modern discards associated with the shelter, which was probably occupied in the 1960s. Petroglyphs included prehistoric masks, handprints, footprints, and animals, as well as twentieth century inscriptions (Figs. 5-11 through 5-16). Most of these occurred in the easternmost petroglyph panel, 200 m. south-southeast of the historic cave, but a few were reported from the cave area and from a small panel lying midway between the cave and the major panel.

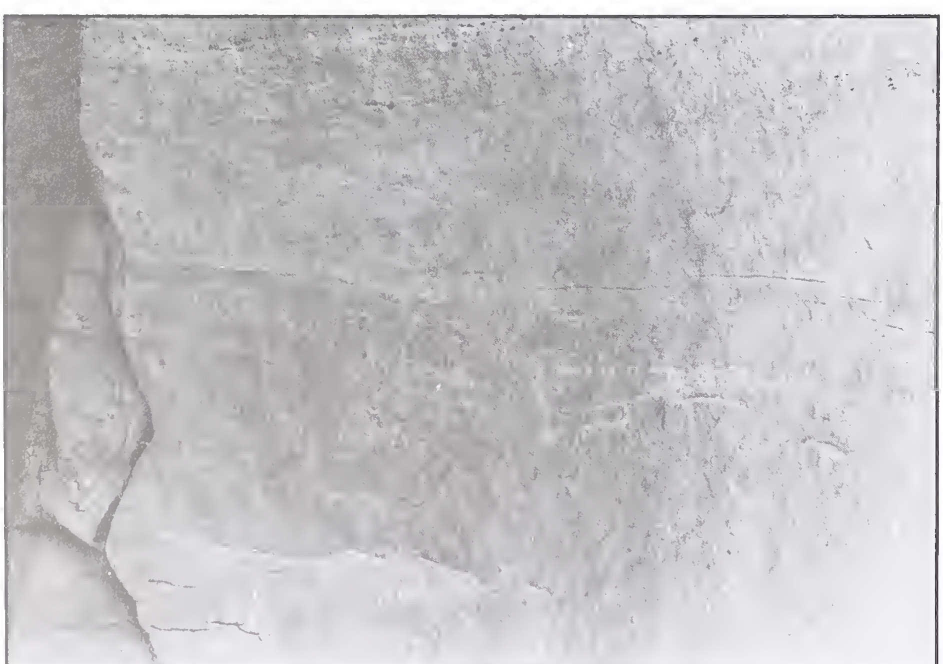


Figure 5-13. Site FA 2-16 Petroglyphs.

Testing Procedures

The site was tested on April 15, April 27, April 29, May 5, and May 6, 1982. Testing included inspecting the site at close intervals and artifact flagging, with three datum points being installed. As prehistoric artifacts were found, a pace-and-compass map was drawn and surface artifacts were collected. Six shovel tests were dug in the vicinity of the rockshelter. Two test pits were excavated. These were placed in an area of ash staining and within the shelter.

Surface Description

Surface study of the site revealed the petroglyph panels already reported. Artifact scatters were discovered in the vicinity of the rockshelter and in an area midway between the shelter and the central petroglyph panel. The eastern artifact scatter was associated with an ash stain (Map 5-15). It contained over 15 sherds, 3 flakes, bone, shell, and a chopper, associated with a scatter of burned rock fragments. The area in front of the shelter contained a probable modern hearth, a cobble outcrop or pavement, 3 sherds, 2 choppers, a utilized flake, perhaps 5 cores, and some 20 items of debitage. A hearth, a core, three sherds, and a flake were noted near the central petroglyph panel. No artifacts were observed in the eastern petroglyph area. Modern and fossil packrat middens were noted on the site.

Subsurface Testing

Shovel testing was carried out near Datum 1. Six tests were dug (Table 5-9). None encountered artifacts, but the three tests closest to the shelter contained charcoal, suspected to be recent. Sandstone bedrock was encountered near the rockshelter at around 10 cm. depth. To the east, sand in excess of 50 cm. depth was found. To the northeast, a cobble deposit like that at the shelter mouth was found at 12 cm. depth. A pollen sample was collected from this test. To the southeast, sand overlay bedrock at 30 cm. depth, while bedrock was not found at 40 cm. depth in the sandy southern test.

A formal test pit was dug in the center of the 15 sq. m. ash stain near Datum 2. A second pit was placed in the rockshelter floor, to determine if earlier deposits underlay the recent disturbance. All fill was screened.

Test Pit 1, a 1 by 1 m. unit, was placed with its southwest corner at 97N/99E, relative to Datum 2 (defined as 100N/100E). The unit was roughly centered in a deposit of ash and charcoal, 10-15 sq. m. in extent, associated with burned rock and the Datum 2 artifact concentration (Feature 1). Two corrugated sherds and several burned and unburned cobbles were present on the unit's surface. One cobble may have been used as a mano.

Loose surface soil was stripped; two sherds, burned rock, a chopper, and bone were recovered. Compact ashy soil down to 10 cm. was then removed as Level 1. About 25 sherds, some exhibiting burning, were found, along with bone, burned rock, and large quantities of charcoal. A floatation sample and a pollen sample were collected. A ground stone artifact with adhering pigment was collected at the Level 1-2 contact.

Level 2, dug to 20 cm. depth, produced burned and unburned bone, shell, and sherds. As completion of Level 2 had apparently penetrated past the bottom of the hearth stain (Stratum 1) at 12 cm. below surface, excavation was abandoned in the yellow sand substrate (Stratum 2) at 20 cm. depth. Only root or rodent disturbance seemed to have carried sporadic stained soil below that depth (Fig. 5-17).

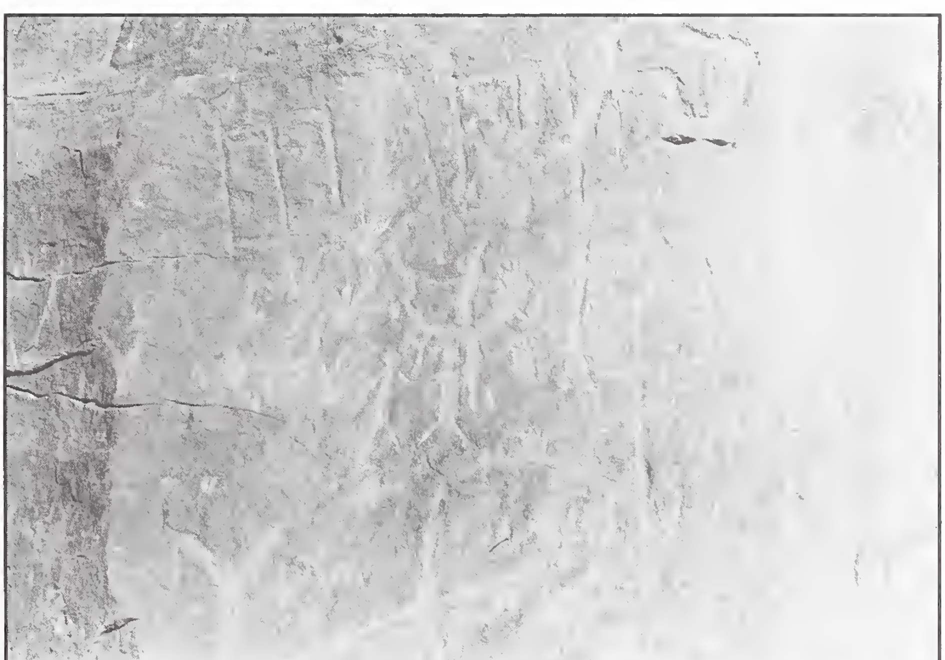


Figure 5-14. Site FA 2-16 Petroglyphs.

Test Pit 2 was placed in the shelter (Feature 2), with its southwest corner at 104N/96E, relative to Datum 1 (defined as 100N/100E). Only the north half of the unit was dug. This was done to test the shelter fill without excessively disturbing either the fill or the cobble pavement extending from the south half of the unit out of the shelter to the south and east. A flake was found in the unit in the loose surface fill.

Underlying the surface duff, a very compact 2 to 5 cm. thick layer of woodrat dung was encountered and removed as Level 1. A second flake was found in this level, which overlay a soft sand with substantial rodent disturbance, including open burrows. A mummified woodrat was found just below the dung level.

This loose, tan sandy fill was removed down to 20 cm. depth as Level 2. As excavation proceeded

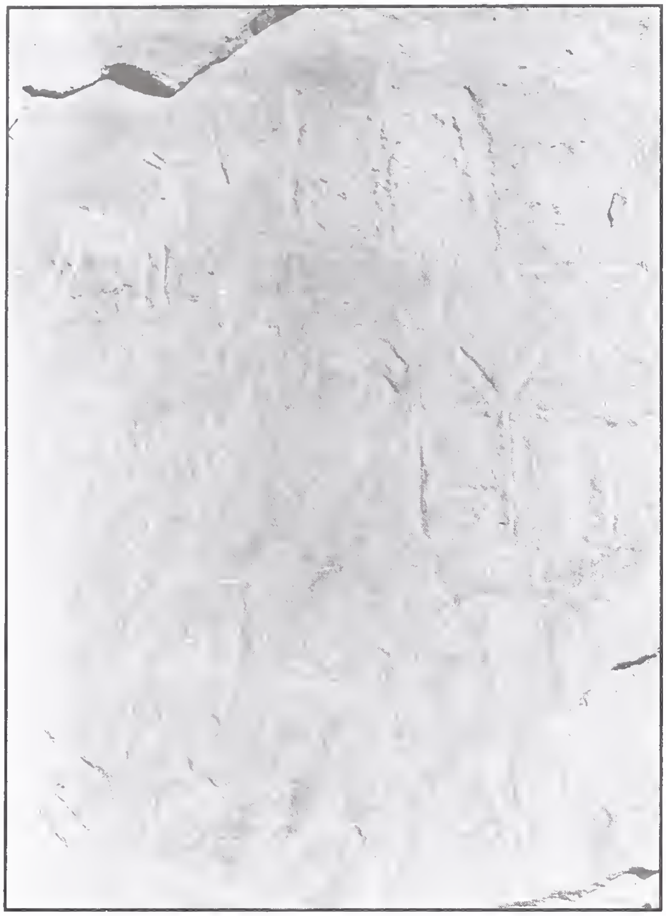


Figure 5-15. Site FA 2-16 Petroglyphs.

downward, the fill became more compact, with charcoal and tiny flakes noted. Difficulty in maintaining depth control was experienced as a result of the looseness of the pit walls, and contamination caused by slumping was suspected. The excavation was closed.

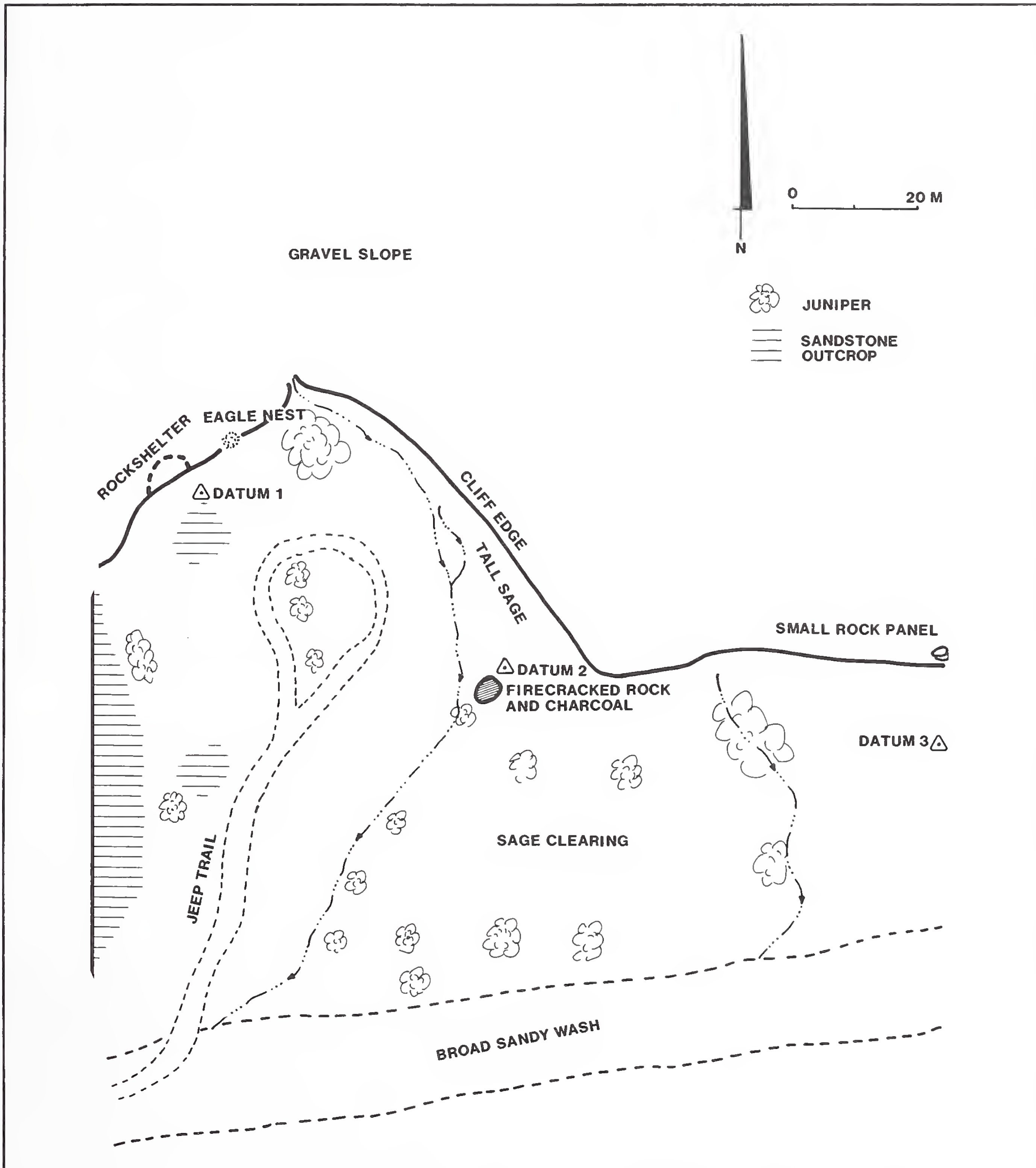
When the unit was reopened a week later, minor vandalism and new rodent disturbance were noted. After cleanup, a surface pollen sample was collected, and Levels 3 (20-30 cm. depth) and 4 (30-40 cm. depth) were excavated. They contained mixed rat midden, a variety of vegetable matter, feces, and charcoal; samples of all of these were collected. A piece of pecked stone was collected at 30 cm., and a possible artifact was found in Level 4. At the bottom of Level 4, sandstone bedrock was encountered in the southwest corner of the unit. Both pollen and floatation samples were collected at 20 and 35 cm. depth.

Level 5 (40-50 cm. below surface) seemed relatively undisturbed by rodent activity. It was characterized by gray clay content increasing with depth. By the end of the level, only the northwest quarter of the 1 by 0.5 m. unit still contained soil; the remainder had reached bedrock. Two sherds, a flake, a possible ground stone item, and a charcoal sample were recovered. Pollen was collected at 45 cm. depth.

Level 6 (50-68 cm. below surface) contained charcoal, which was collected, but no artifacts. Pollen samples were collected at 50 and 60 cm. depth. A floatation sample was taken at the Level 5-6 contact, apparently from an ash lens lying mostly in Level 6. Bedrock was reached across the entire unit by 68 cm. depth.

Stratigraphically, it appears that the surface soil (Stratum 1) overlay the Level 1 compact dung layer (Stratum 2) conformably (Fig. 5-18). The dung layer seems to have intruded in places into Level 2 (Stratum 3) as a much less compact fill in burrows. Stratum 3 was a light-colored, laminated fill that extended through Level 3 and extended down into Level 4 only a little. Level 4 (Stratum 4) was a darker, laminated fill, which met the Stratum 5 gray clay just at or below the Level 4-5 contact. All the deepest fill (lower Level 5 and Level 6) seems to have

Figure 5-16. Site FA 2-16 Rockshelter.



Map 5-15. Site FA 2-16 is a complex of three petroglyph panels with associated scatters and a rockshelter, all probably of Anasazi affiliation.

pertained to Stratum 5 or to an ash lens (Stratum 5A) within that stratum. All strata were disturbed by rodents, but the intensity of that disturbance seems to have declined rapidly with depth.

Analyzed Samples

Samples analyzed from Site FA 2-16 included 4 floatation samples, 7 pollen samples, 141 bone and shell pieces, a woodrat mummy, 56 sherds, and 2 radiocarbon samples. With the exception of the sherds and bone, these came predominantly from the shelter test and surrounding surface collections.

Feature 1, dated by radiocarbon at 730 ± 70 B.P. (TX-4925, A.D. 1220 to A.D. 1336 with midpoint at A.D. 1278 according to the Klein et al. [1982] 95% confidence tables), produced undiagnostic plain smoothed grayware sherds, possibly from the bottoms of several Mancos Gray vessels, six sherds of Mancos Corrugated (A.D. 900-1200), and two sherds of Mancos Gray (A.D. 875-950). Some of these pieces were burned. A Mancos Corrugated sherd refired yellow-red (Raish, this volume).

A floatation sample from Feature 1 yielded charred goosefoot seeds, along with a variety of unburned weed seeds (Donaldson, this volume). A large faunal collection from Feature 1 included ornament fragments, probably of abalone shell, together with Ord's kangaroo rat bones, cottontail rabbit bones, and deer fragments. Large mammal humeral, vertebral, rib, and long bone fragments were recognized, most of them roasted. These probably pertain to the deer definitely recognized, but mountain sheep or antelope could also be present. The smaller forms, unburned, may be intrusive, although a cottontail piece seems to bear cut marks.

A variety of samples was analyzed from Feature 2, which dated on charcoal from the ash lens within Stratum 5 at 1490 ± 90 B.P. (TX-4926, A.D. 345 to A.D. 645 with midpoint at A.D. 495 according to the Klein et al. [1982] 95% confidence tables). Sherds (Raish, this volume) from the bottom of Stratum 4 or from Stratum 5 were Mesa Verde B/w (A.D.1150-1300 or later). Bone material included only a mummified, immature woodrat (Bertram, this volume). Pollen and floatation analyses were more productive.

Pollen analyses (Scott Cummings, this volume) for Feature 2 were carried out on samples from the surface, both within and outside of the shelter, and from subsurface contexts within Strata 3, 4, 5, and 5A. A sample from the bottom of Stratum 5 was too sparse to analyze. Surface pollens within and outside of the shelter were dominated by juniper singles and aggregates and contained low frequencies of cheno-ams, sage, and low-spine composites. Pinyon aggregates and Opuntia were present only in the external sample. The Stratum 3 sample was similar to the surface shelter sample, but it contained a few grains of beeweed.

The pollen from Strata 4 and 5 document a major change in pollen rain. The Stratum 4 sample was dominated by pine (probably pinyon), with less juniper, more low-spine composites and more cheno-ams than the reference samples. Cheno-ams occurred as aggregates. Both varieties of Mormon tea were also present. Stratum 5 contrasted in that more juniper was present, low-spine composite singles and aggregates were common, and cheno-ams remained abundant. A trace of Opuntia was present.

The Stratum 5A sample contained little arboreal pollen. Quantities of sage and of low-spine composite pollen were seen, with both occurring as singles and as aggregates. Mormon tea and corn pollen were present.

Macrobotanical analysis for Feature 2 (Donaldson, this volume) indicated a wide range of unburned weed and

Table 5-9. FA 2-16, Shovel Test Results (tests with detailed descriptions only).

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	0.7	311	10	C	Yes
2	1	4	311	10	C	Yes
3	1	28	94	50	C	No
4	1	21	67	12	P	?
5	1	22	145	30	-	Yes
6	1	20	190	40	-	No

Key: C-Charcoal P-Pollen

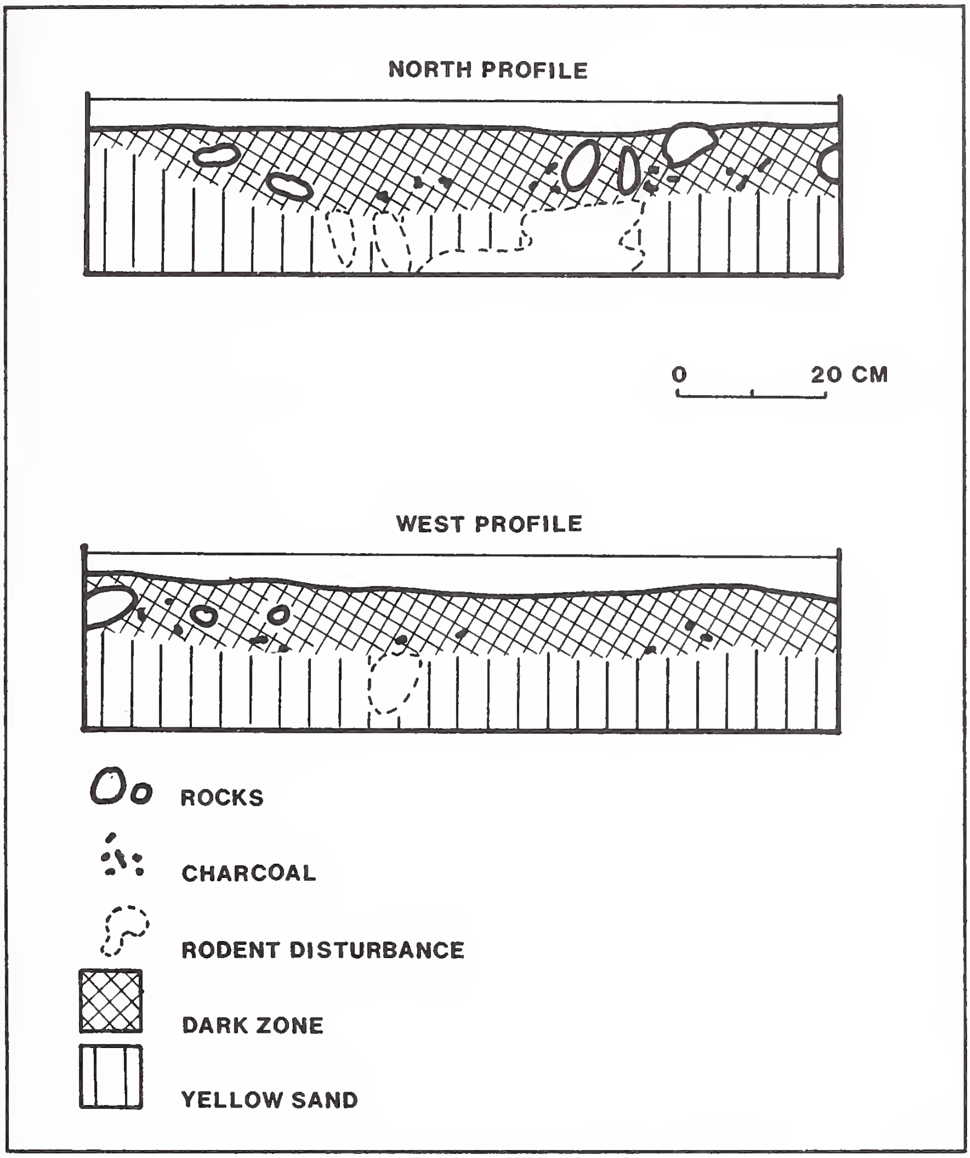


Figure 5-17. Site FA 2-16, test pit 1, north and west profiles.

grass seeds distributed through the stratigraphic column. Burned items included goosefoot (Chenopodium) seeds from Stratum 4 and juniper twigs from Stratum 3. Also found were a burned corn cupule, juniper charcoal, and cottonwood/willow charcoal from Stratum 5A.

Comments

Interpretation of the data recovered from this site points strongly to a multicomponent occupation of the Feature 1 area and also to use of the Feature 2 shelter over a long period.

Feature 1 seems to be a hunting and processing location where deer and perhaps other animals were processed, focusing primarily on the roasting for consumption of cuts that neither transport nor dry well. Marrow consumption and goosefoot seed processing may have been contemporary, secondary activities. Meat was probably boned, jerked, and exported. Unburned or unroasted bones may have been lost to weathering. Stews may have been prepared.

The Feature 1 carbon date accords only marginally with the Feature 1 ceramics, but quite well with the Feature 2 Mesa Verde B/w sherds, suggesting that the two features may be related in part. Use of the hearth or hearths, which contributed to the reworked Feature 1 ash lens, thus seems to have, at minimum, an early PII component and a PIII component. Possibly an earlier use during Basketmaker times may be suggested by the early date from Feature 2.

The Feature 2 stratigraphy seems to reflect occupation from Basketmaker to PIII times, with food processing or storage occurring mainly during the earlier period. The curious association of cottonwood-willow and corn must indicate either import of fuelwoods, a local spring, or much more mesic conditions at this upland site at around A.D. 460. The discordance of the ceramic and radiocarbon dates for Stratum 5 and 5A may indicate that the Stratum 5 upper fill accreted very slowly, that rodent disturbance was more severe than was thought, or that the radiocarbon date is in error. The charred goosefoot seeds found in Feature 1 and also in Feature 2, Stratum 4, may indicate broad contemporaneity of these deposits, but goosefoot occurs in sites of every time period in this area (Donaldson, this volume).

The ceramic variability from this site; the evidence of major vegetational changes reflected by the shifting dominance of pine, juniper, and annuals; and the pres-

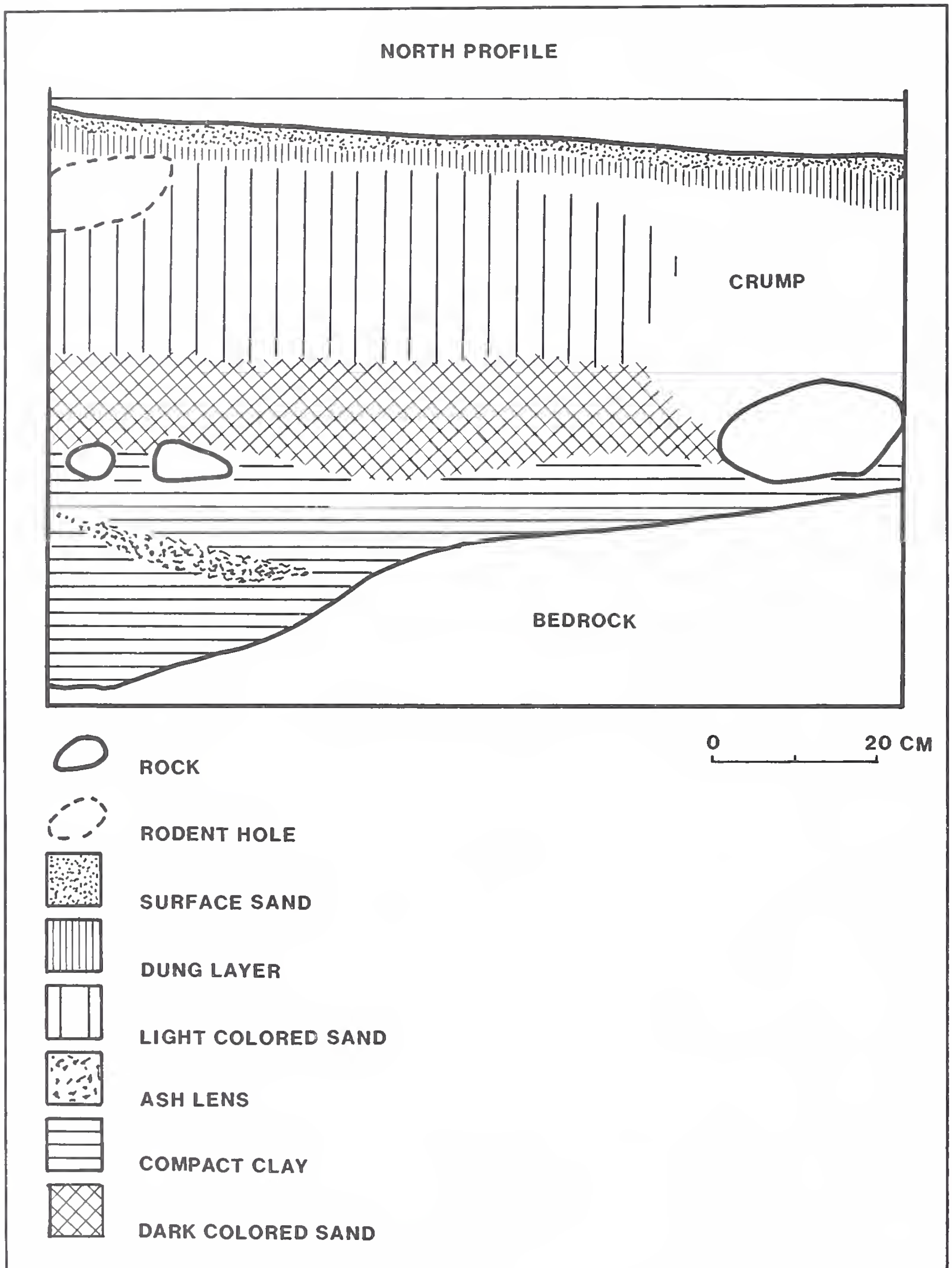


Figure 5-18. Site FA 2-16, test pit 2, north profile.

ence of mesic fuelwoods all strongly suggest that Site FA 2-16 served as a multiple-function camp during several biotically or climatically different periods. Raish (this volume) also makes this point, further speculating that an undetected field house may have been present on the site. If so, the dominance in lower cultural strata of weedy species and other indicators of soil disturbance would be explained. A field house constructed at the Feature 2 shelter mouth could be indicated both by the cobble concentration immediately south of the Feature 2 test pit and also by the presence of clay (wall-melt?) deposits within the shelter's lower levels.

If a future project should permit further work at this site, effort should focus on the area of Feature 2, with the goals of (a) determining the architectural character of the fill and of the exterior deposits at the shelter; (b) determining the ties, if any, between use of the two feature areas; (c) acquiring more biotic and chronometric data on the apparent and possibly short-term shifts in vegetation suggested by the pollen sequence and macrobotanical data reviewed here; and (d) resolving the dating conflicts noted in both features. Collection and analysis of the packrat middens reported by the survey team would be a valuable adjunct to any such study, as would additional study of the petroglyph panels.

FA 2-17

Site FA 2-17 is an aceramic lithic scatter with associated Anasazi- and Archaic-style projectile points and an ash stain. It was assigned the Laboratory of Anthropology number LA 33745.

Location

The site is located on the eastern side of an unnamed canyon formed by the first important northern tributary entrant to the San Juan River upstream from its confluence with the Rio Animas, in Township 29N, Range 12W, Section 17. Site FA 2-15 lies across the canyon to the northwest, and sites FA 3-6 and FA 2-19 lie upslope and up the canyon to the northeast. The site, which lacks any substantial overlook, is situated at the lower end of a gentle ridge that drops more steeply west of the site into the canyon bottom 80 m. away and 12 m. below. It lies at an elevation of 5,525 ft. (1,684 m.) in blowouts on dunal sands vegetated by pinyon, juniper, Mormon tea, and sparse bunch grasses.

Survey Description

On survey, the site was characterized as an aceramic lithic scatter, consisting mostly of debitage located in blowouts, and having a core area of 450 sq. m. and a total extent of 3000 sq. m. No features or stains were noted. A retouched flake or point preform of red chert, a broken point or preform of pale silicified wood, and a chert, Archaic side-notched point base of the generalized Chiricahua/Arroyo Hondo/"Navajo" type (Thoms 1977; Chapman 1977:100) were collected. The site was judged to be relatively undisturbed by slopewash. Potential for subsurface deposits was judged to be high.

Testing Procedures

The site was tested on March 25 and on March 30-April 1, 1982. Testing consisted of inspecting the site and flagging the artifacts, and installing three datum points. Mapping was carried out from these datum points, using a metric grid system with units named by their northeast corners. Collection proceeded by grid, piece-plotting, and collecting selected artifacts from sparse areas, but tape-gridding and collecting most grid units in areas of greater artifact densities. The total site was not collected. Subsurface testing included placing of approximately ten shovel tests in one locus and excavating shallow 1 by 10 m. test trenches in the other two loci.

Surface Description

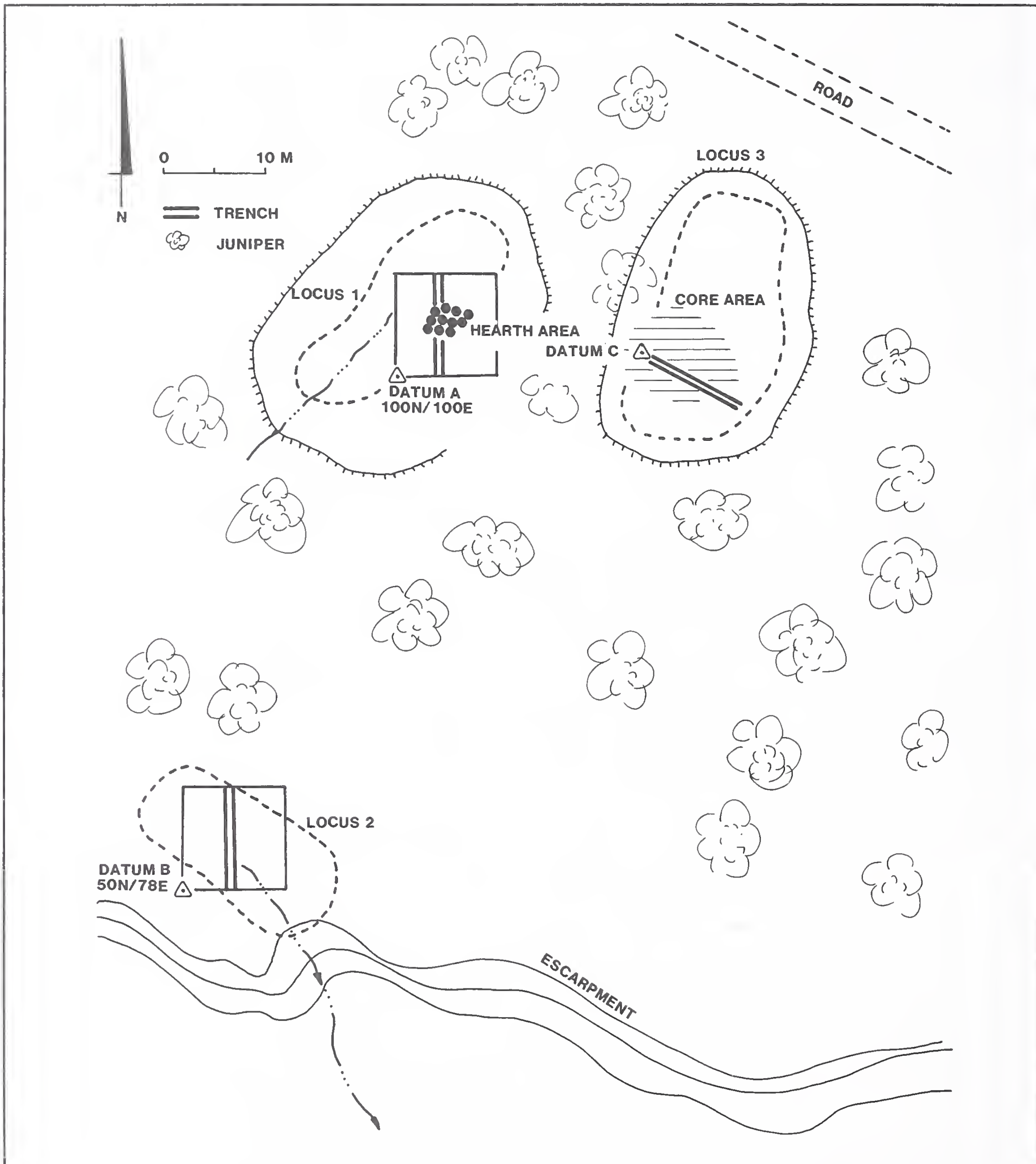
Surface examination revealed a discontinuous scatter of artifacts lying in three adjacent blowouts within a 50 by 100 m. area (Map 5-16). The northwestern blowout contained a lithic concentration associated with a 4 by 4 m. ash stain. This concentration area was named Locus 1. Datum A was established just southwest of the stain and was assigned the coordinates 100N/100E. A second concentration (Locus 2) lay 60 m. south-southwest, the second datum was established, at 50N/78E relative to Datum 1, just to the southwest of Locus 2. A third concentration (Locus 3) lay 20 m. east of Locus 1, and a third datum was established on the northern edge of Locus 3 at approximately 102N/125E, relative to Datum 1. Datum 3 was assigned coordinates 0N/0E in a separate grid system.

Artifacts were collected from Locus 1, a scatter estimated to cover 150 sq. m., only within the grids 96-110N/101-103E, 98- 99N/104E, and 101-110N/104-107E. Within this area, burned rock was noted in six grid units near or in the ash-stained area. A hammerstone, a mano, and two cores were collected in the ash area, and bone was collected from three grid units. The collected area produced approximately 120 flakes. Of the 87 contiguous 1 by 1 m. units collected, 23 had no debitage, 10 had only one flake, and 54 had 2 or more flakes per unit. Field notes suggest that the concentration became very sparse east of the collected area, but that an uncollected dense scatter extended for some meters in all other directions beyond the collected units.

Artifacts were collected from the Locus 2 scatter, estimated to cover 200 sq. m., only from the 10 by 10 m. grid bounded by the lines 79E, 89E, 50N, and 60N. Collection was provenienced by square meter units. Within this area, burned rock was noted in one unit, bone was found in one unit, and a point, a chopper, and a core were collected. Altogether, approximately 120 flakes were collected. No flakes were found in 35 units, 1 flake was found in each of 20 units, and the remaining 45 units had 2 or more flakes each. Two subconcentrations appear to be represented, lying respectively in the west-central and far eastern portions of the collected grid. The eastern subconcentration appears to have extended some distance beyond the grid boundary.

Artifacts were collected in Locus 3 from a scatter of an estimated 300 sq. m. Collection was carried out only over an area extending from Datum 3 south for 10 m., west for 8 m., and east for 10 m. About 55 flakes were found, but no other artifacts were noted or collected from an area of approximately 100 sq. m. to the south of Datum 3. The density and extent of the scatter to the north of datum are not reported, but it appears to have extended for some distance.

Two projectile point fragments were collected from outside the loci. A tip was collected 27 m. east of Datum 3



Map 5-16. Site FA 2-17 is an aceramic lithic scatter with associated Anasazi- and Archaic-style projectile points and an ash stain.

and a base from an arrowpoint was collected from between Loci 2 and 3. A single Mancos Corrugated sherd was collected outside the site area from an access road cut north of the site boundary.

No artifacts were recovered outside the three loci, nor does the site map indicate a site boundary.

Subsurface Testing

Excavation in Locus 1 consisted of shovel scraping and screening of a 1 by 1 m. trench containing the units 101-110N/105E. Units 108-110N were excavated to 20 cm. depth, but the southern seven units were terminated at 5 cm. depth because a dark stain appeared. Notes indicate that a darker stain, perhaps a hearth, was present near the center of the stained area. The area was trowel scraped, and pollen and floatation samples were collected. Photographs indicate the darker area of the potential hearth lay in the west side of Unit 105N/106E.

Artifacts recovered from this excavation included a side-notched arrow point from Unit 109N, bone from Units 103N, 105N, and 106N, and multiple flakes from all units except 101N and 102N, which contained one flake each. Additional flakes were recovered in trowel scraping, most of them from the stained area.

Excavation in Locus 2 proceeded in a similar fashion. The 1 by 1 m. test trench was laid out to include the units 51-60N/83E. All units were dug to 10 cm. depth. No stains were encountered, and artifacts seem to have been confined to the upper 5 cm. of loose fill.

Only flakes seem to have been recovered, although field notes mention the finding of a side-notched arrow point. Flake density was highest in the southern units, and only one flake was recovered in each of Units 58-60N.

Excavation in Locus 3 consisted of shovel testing at 1 m. intervals along a baseline originating at Datum 3 and proceeding to the southeast or south (notes are inconsistent on this point) for a distance of 10 m. Tests were shovel-cut to 30 cm. depth.

Multiple flakes were found in tests at Datum 3 and at 1, 3, 4, 6, and 9 m. from Datum 3. A single flake was found in tests at 7 and 8 m. from Datum 3. The tests at 2, 5, and 10 m. were sterile. No ash, charcoal, or stratigraphy seem to have been encountered in any of the tests.

Analyzed Samples

Samples analyzed from the site all came from Locus 1, including 15 surface and subsurface bones, a single pollen sample, and one floatation sample. Bone specimens (Bertram, this volume) included probable cottontail rabbit (3 pieces), rabbit or hare (5 pieces), small mammal (1 piece), and large mammal (6 pieces). All pieces were roasted or burned. Subsurface pieces, interestingly, were generally more leached and weathered than surface items. This suggests the presence of rather permanent high moisture levels in the subsurface sand and indicates that much unburned bone may have been lost through total leaching. Pollen (Scott Cummings, this volume) included juniper, low-spine composites, and high frequencies of cheno-am singles and aggregates. Scott Cummings suggests that the cheno-ams may reflect cultural activity and notes that the composites indicate vegetational disturbance near the site. Macrobotanical remains (Donaldson, this volume) from floatation included a juniper seed, juniper twigs, and one (apparently unburned) legume seed.

Comments

The cultural resources collected from this site were almost entirely lithic debitage. It is intriguing that most of the points appear, based on field identification, to be late Anasazi types, yet the site would be judged as preceramic based on the absence of clearly associated ceramics. The one sherd from the site vicinity, a Mancos Corrugated piece, had temper suggesting La Plata Valley manufacture (Raish, this volume).

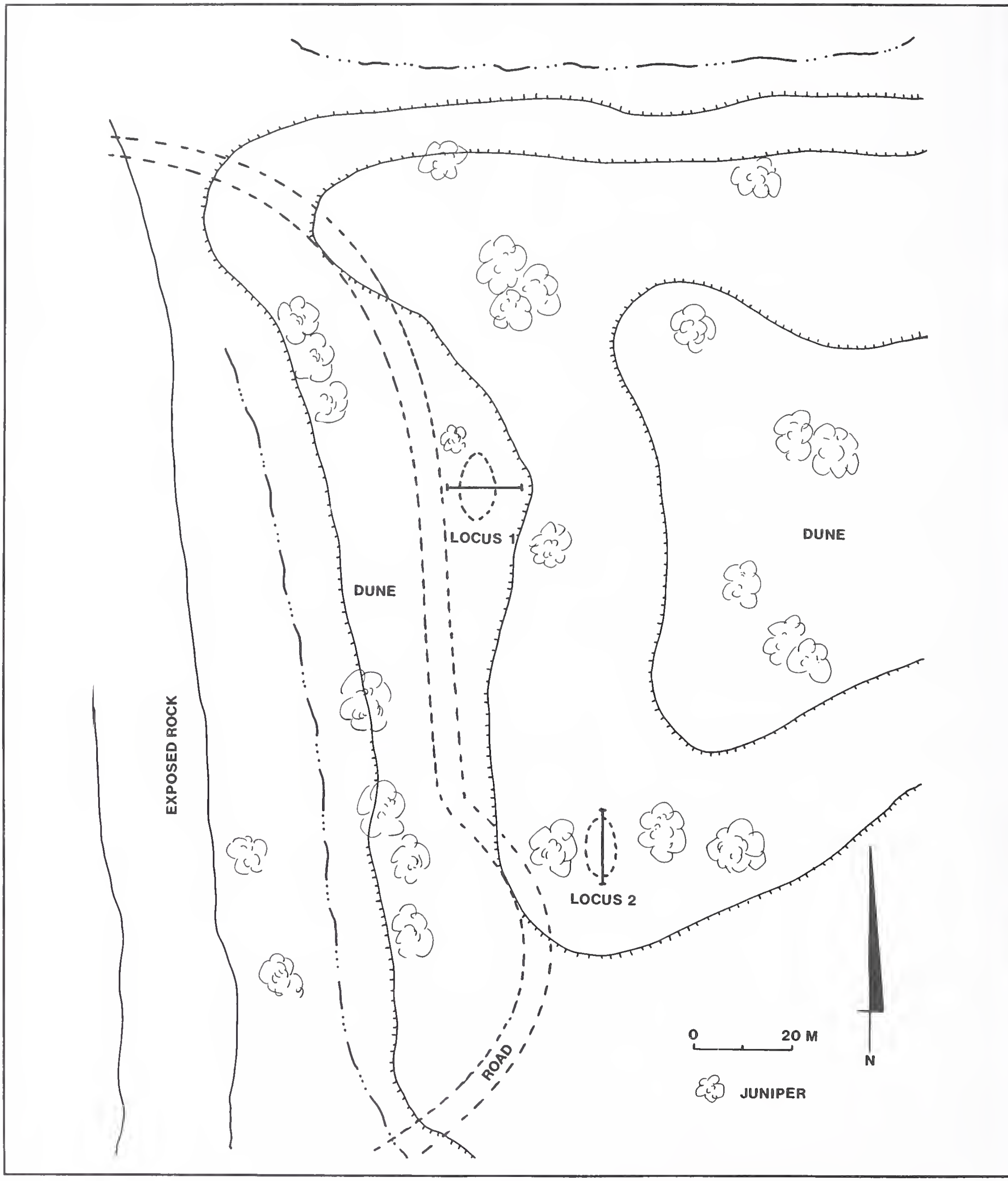
Procedures used in field testing at this site did not include excavation of features to their full depth. Consequently, no clear indications of the character of the feature or of the substrate were obtained. This site probably still retains significant data recovery potential.

FA 2-18

Site FA 2-18 is composed of one or more aceramic lithic scatters exposed on a large coppice dune. It was assigned the Laboratory of Anthropology number LA 33746.

Location

The site is located 350 m. southwest of Site FA 1-9, in Township 29N, Range 12W, Section 17. The site is set on a large, elevated, and isolated coppice dune, atop a cobble ridge, at an elevation of 5,705 ft. (1,739 m.). The site overlooks the northern head of an unnamed canyon to the east and commands a restricted overview of the canyon slopes and floor to the south. Vegetation includes sparse trees, some shrubs, and rather dense bunchgrass clumps.



Map 5-17. Site FA 2-18 is composed of one or more aceramic lithic scatters exposed on a large coppice dune.

Survey Description

The site was characterized on survey as an aceramic lithic scatter dominated by cherts, with cobble manos and quartzite metates. A gas well access road formed the western site boundary. One concentration of artifacts was reported. A stemmed dart point of red chert was collected. The site was judged to have exceptional depositional potential based on the evident depth and extent of the dune deposits. Its chert-dominated assemblage and numerous metates suggested that it might contain informative assemblages relating to a limited range of activities.

Testing Procedures

The site was tested on April 6 and 7, 1982. Testing consisted of installing two datum points at artifact concentrations, mapping with taped grids and collecting artifacts from the two concentrations, pace mapping of the site area, and installing 15 shovel tests in each of the two concentrations. Shovel tests were dug to 30 cm. below surface. Auger cuts were made in shovel test floors to a depth of 70 cm. below surface.

Surface Description

On inspection, the site was found to consist of two dense lithic scatters located on the south and west slopes of the dune (Map 5-17). The western scatter, named Locus 1, encompassed roughly 200 sq. m. Datum 1 was established on the east side of Locus 1, and a 15 m. long baseline was laid out westward from the datum to allow artifact plotting across the locus. The locus was found to contain 51 flakes, a small burned rock scatter, and a projectile point tip. Two subconcentrations can be discerned from debitage plots, centering respectively about 0N/11W and 2N/3W, relative to Datum 1. The southern scatter, named Locus 2, encompassed roughly 160 sq. m. Datum 2 was established on the north side of the locus, and a 15 m. long baseline was laid out to the south from the datum for plotting. The locus was found to contain 50 flakes but no features, stains, or other artifacts. Only one scatter pattern could be discerned, running roughly along the slope of the dune.

Field notes and maps do not indicate that any recording or testing took place outside the two loci described. No mention is made of the ground stone artifacts reported on survey or of any artifacts other than those collected.

Subsurface Testing

Subsurface testing was limited to the installing of shovel cut transects at 1 m. intervals along the 15-m.-long baselines crossing the two loci. At Locus 1, one flake was found in each of three shovel cuts, lying at 3, 10, and 12 m. west of Datum 1. All other cuts were sterile. No ash or charcoal were reported from any Locus 1 test, and no artifacts were reported from any auger tests. It is not known whether bedrock or soil changes were encountered.

At Locus 2, the only completely unproductive tests were those at 1, 9, 10, 14, and 15 m. south of Datum 2. One flake was found in each of the shovel tests dug at 5, 6, 7, 8, 11, and 13 m. south of datum, two flakes were found in each of the shovel tests dug at 4 and 12 m. south of datum, and a flake was found in each of the auger tests dug at 2 and 3 m. south of datum. No ash or charcoal was noted in any subsurface test. It is not known whether bedrock or soil changes were encountered in subsurface tests.

Analyzed Samples

No chronometric or biological samples were collected from this site, other than an undiagnostic Middle Archaic to Anasazi projectile point.

Comments

Spatial data suggest that two to three distinct and homogeneous debitage deposits may be represented in recent erosional exposures. Chronometrically, the site seems preceramic, but the apparently similar aceramic assemblage from Site FA 2-17 seems to contain dominantly PII and PIII lithic diagnostic items. Consequently, no temporal interpretation is advanced.

FA 2-19

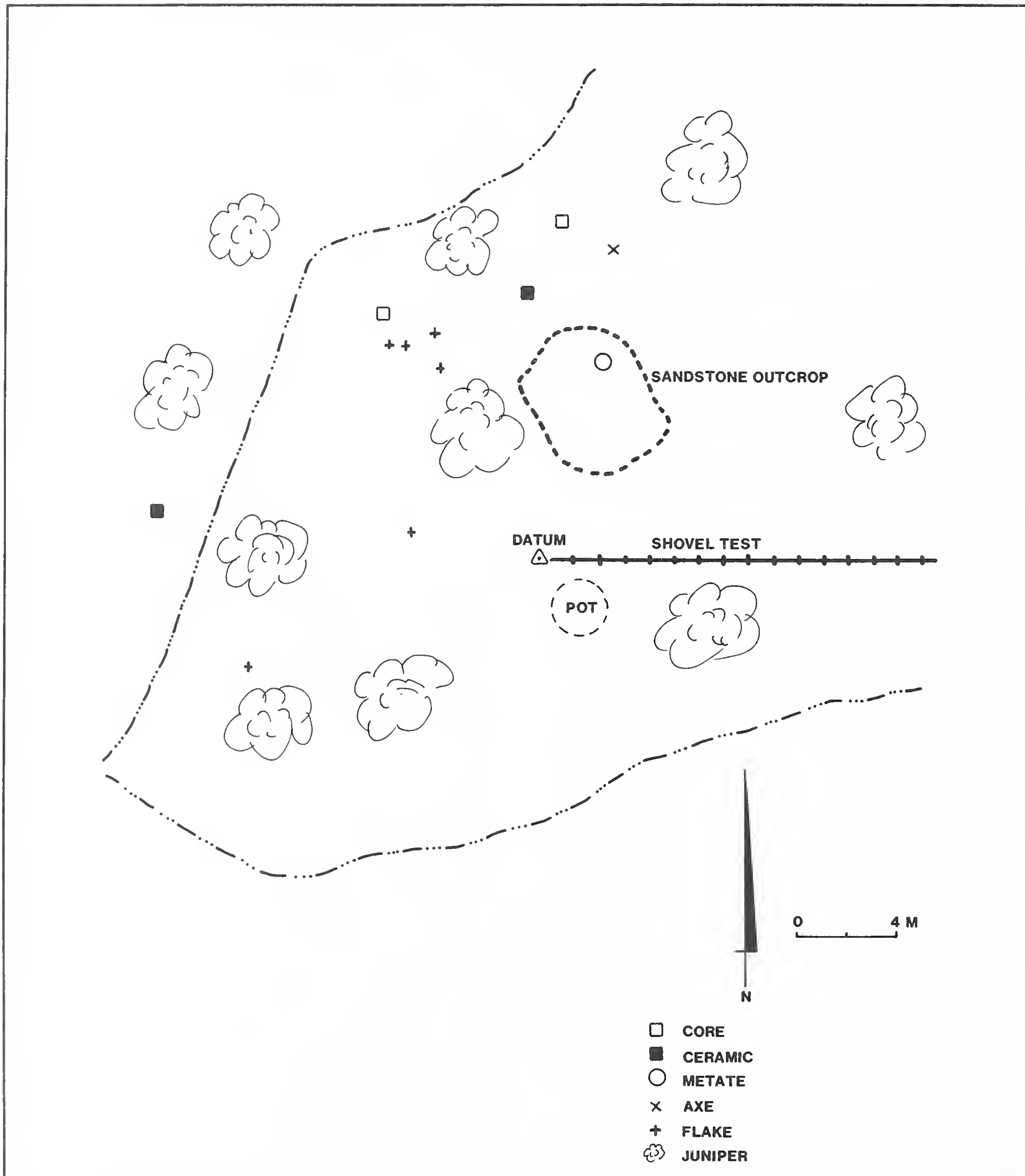
Site FA 2-19 is a small lithic and ceramic scatter. It was assigned the Laboratory of Anthropology number LA 33747.

Location

The site lies 400 m. northeast of Site FA 2-17 and 200 m. west of the high ridge upon which Site FA 2-18 is set. The site is located in Township 29N, Range 12W, Section 17, at an elevation of 5,560 ft. (1,695 m.). The site is on a gradual west slope in a sheet-washed area of sandstone outcrops. The site area supports dense juniper scrub with a Mormon tea and sage shrub understory. Soils are sandy and bunchgrasses are sparsely distributed.

Survey Description

The site was characterized on survey as a sherd scatter, possibly from one B/w vessel, associated with a few



Map 5-18. Site FA 2-19 is a small lithic and ceramic scatter.

quartzite flakes and core fragments and a trough metate fragment. Several sherds were collected. The site was judged to retain little research potential.

Testing Procedures

The site was tested on March 18, 1982. Procedures included installing a datum, inspecting the site and flagging the artifacts, mapping with compass directions and pace measurements, totally collecting all artifacts, and excavation of a 15 m.-long shovel scrape test about 30 cm. wide.

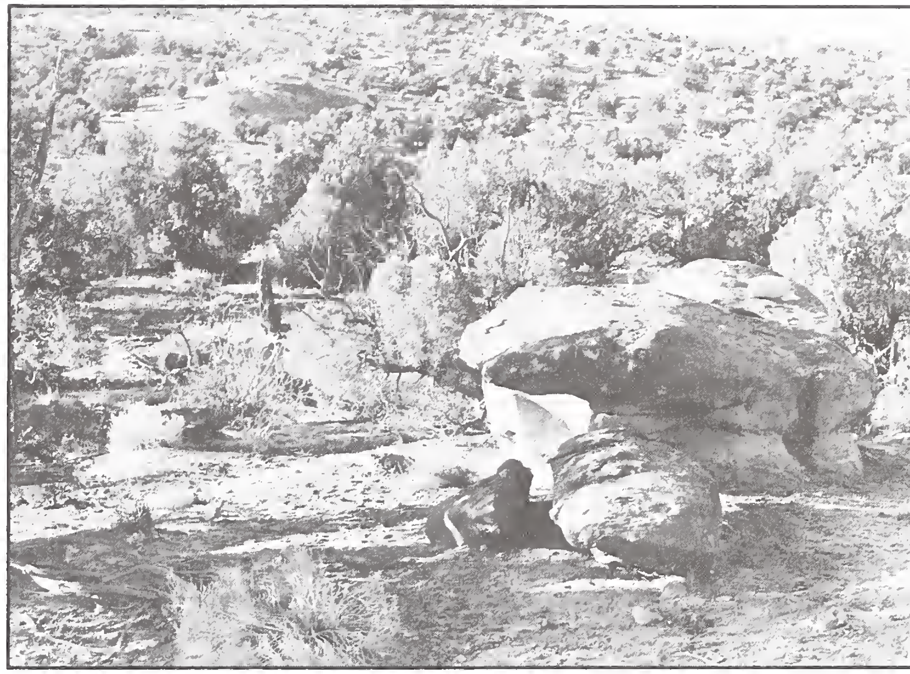


Figure 5-19. Site FA 2-19.

Surface Description

On inspection, the site was found to consist of a sherd cluster at datum and a downslope scatter of two sherds, six flakes, two cores, and a possible axe fragment. The sherd cluster lay 5 m. south of an outcrop that may have served as a small shelter (Map 5-18; Fig. 5-19), on which rested the metate fragment reported on survey. The scatter, 22 m. by 12 m. in size, extended downslope from the outcrop and sherd cluster. The ax was found 4 m. north of the outcrop.

Subsurface Testing

Subsurface testing consisted of excavation of a 30 cm. wide shovel cut, originating from datum and running 15 m. upslope. The cut was excavated to bedrock, which was encountered 10-15 cm. below surface. No artifacts were recovered in this excavation.

Analyzed Samples

Analysis of the 21 sherds collected from this site indicate the presence of four or more Mancos B/w bowls (A.D. 950-1150 or later), a sherd of which was experimentally refired to a yellow-red-buff color (Raish, this volume), possibly indicating La Plata Valley manufacture.

Comments

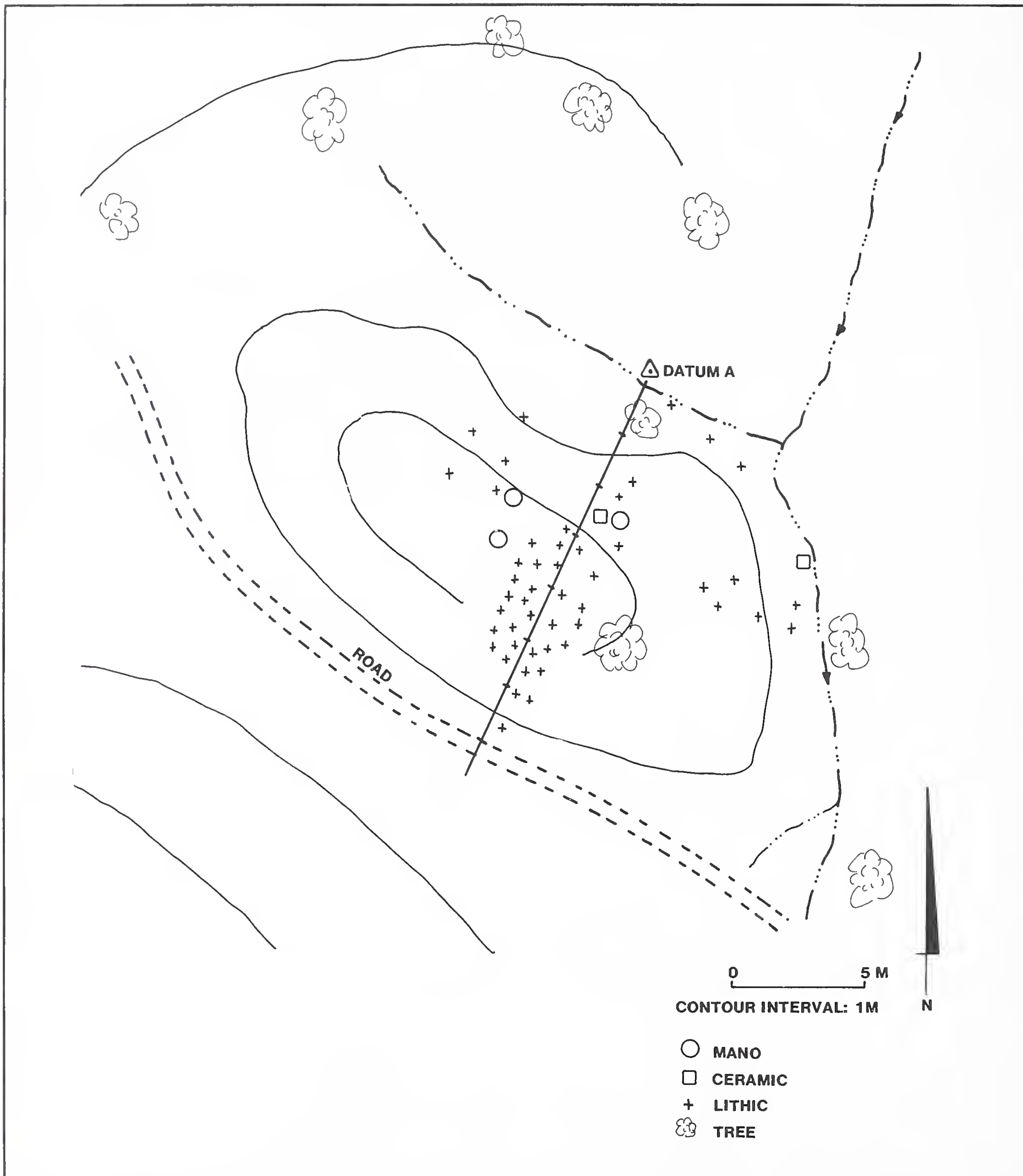
The site appears to represent a location at which a range of activities was repeatedly carried out during PII or early PIII times, but at which no intensive processing or fuel use occurred. It may have been simply a suitable place to rest while traveling or during breaks from fieldwork, hunting, or collecting. Such locations could be the occasional scene of casual tool repair and food consumption. The presence of multiple vessels in what was interpreted by both survey and testing crews as a pot drop may further indicate routine, non-intensive use. Children might also have accumulated the vessel fragments and other expended tools, using Site FA 2-19 as a play area. Alternatively, a stack of vessels may have been broken here. The presence of a probably curated metate fragment atop the outcrop boulder may indicate reuse of a stone (broken elsewhere) as a convenient but expendable small vessel or grinding tool left at a field location as site furniture.

FA 5-1

Site FA 5-1 is a lithic scatter with associated ground stone and a mano concentration near a possible hearth. The site was assigned the Laboratory of Anthropology number LA 33762.

Location

The site is situated on the southwestern slopes of Hood Mesa, 425 m. southeast of Site FA 2-9. Sites FA 5-2 and FA 5-3 are immediately adjacent to the north and northwest. The site sits on a knoll on the drainage divide between Farmington Glade and the Rio Animas at an elevation of 5,705 ft. (1,739 m.), and it commands an overview of the lower reaches of both drainages. Soils are



Map 5-19. Site FA 5-1 is a lithic scatter with associated ground stone and a mano concentration near a possible hearth.

colluvial sands containing numerous clasts produced by sandstone weathering breakdown. They support sparse junipers and bunch grasses.

Survey Description

On survey, the site was reported to consist of a lithic scatter composed of a variety of materials. Better materials were represented by secondary and tertiary biface flakes, but basalt decortication flakes were also noted. A concentration of manos was reported on the northwest site boundary, and a sandstone-lined hearth was noted. The site was reported to be deflated and eroded, with some damage from off-road vehicles.

Testing Procedures

Testing was carried out on April 8, 1982. Testing consisted of mapping all artifacts within a 225 sq. m. area using crossed tape gridding along a 15 m. long baseline oriented from datum at 205 degrees east of north. A map of the terrain surrounding the collected area was made. Eight shovel tests were dug at 2 m. intervals along the baseline. No mention of the hearth or mano concentration is made in testing field notes.

Surface Description

The area tested was bounded on the south by a vehicle track and on the east and north by small arroyos (Map 5-19). On inspection, the tested area was found to contain a 40 sq. m. concentration of perhaps 50 debitage pieces centered at 10 m. south-southwest of datum and a sparser 20 sq. m. concentration of perhaps 10 debitage pieces centered at 8 m. southeast of datum. An additional ten debitage pieces were collected in the area north of the two concentrations. Four manos and a biface were also collected in this northern area. One sherd was collected from the small arroyo just east of the grid collection area.

Subsurface Testing

Subsurface testing consisted of installing eight shovel tests located at datum and at 2 m. intervals south-southwest of datum along the baseline. Shovel tests were dug to bedrock, which was generally encountered at about 20 cm. depth. The test at 2 m. from datum encountered a piece of debitage. No other cultural materials were found in any test.

Analyzed Samples

The only sample analyzed from this site was a Hovenweep Corrugated sherd (Raish, this volume), which dates to A.D.1250-1300. Raish expresses reservations about the type designation, which is based on the style of corrugation, but which may not be consistent with the temper.

Comments

In the absence of lithic analysis, discussion of this site must lean heavily on survey description. From that view, Site FA 5-1 seems to have an unusually high mano frequency and to be unusually variable in lithic material, reduction technique, and reduction stage. Preliminary data from all three sites suggest that this site may reflect activities similar to those suggested for Sites FA 2-9 and FA 5-2 to the northwest, in that complex reduction is present as at Site FA 2-9 and in that substantial secondary and tertiary biface reduction seems to have occurred, as at Site FA 5-2.

FA 5-2

Site FA 5-2 is a deflated slickrock outcrop with solution basins, eleven of which contained large amounts of debitage. It was assigned the Laboratory of Anthropology number LA 33763.

Location

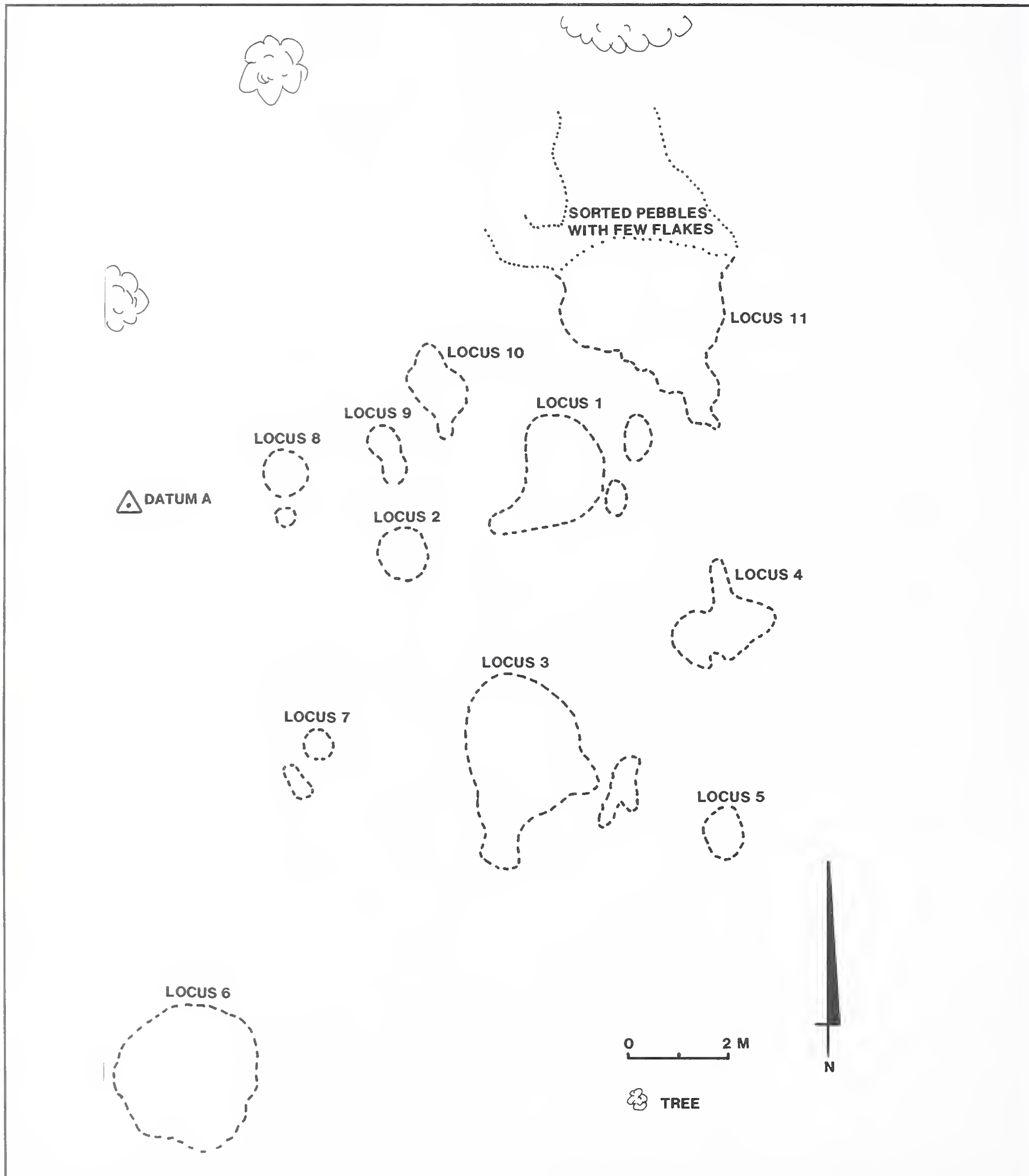
The site is located in Township 30N, Range 13W, Section 34, at an elevation of 5,680 ft. (1,731 m.). The site lies on the south slope of the ridge whose north slope is occupied by Site FA 2-9 and is situated only 90 m. south of that site. The site occupies an almost soil-free slickrock outcrop, with artifacts concentrated in wash holes and solution basins within the rock outcrop.

Survey Description

On survey, the site was described as a scatter of silicified wood and other debitage, including many tertiary flakes, lying in solution pockets on a sandstone outcrop. A road passed immediately to the north of the outcrop. Collected items included secondary and tertiary flakes: six of silicified wood and one of chalcedony. The site was considered to have potential research value in that a total chipping assemblage was probably present on the surface.

Testing Procedures/Surface Description

The site was tested on April 13, 1982. Testing consisted of mapping of 11 solution basins, each named as a locus (Map 5-20). A total surface collection of the contents of all 11 loci was made. In addition, four basins were scraped, and all soil and other contents were bagged for later screening. A total of 3,899 items of possible debitage were recovered; most were of material referable to vari-



Map 5-20. Site FA 5-2 is a deflated slickrock outcrop with solution basins, eleven of which contained large amounts of debitage.

ous silicified woods or local gravel sources. Of these items, most (2,190 items) came from Basin Locus 1; the bulk of the remaining items (823 items) came from Basin Locus 3 (James Snyder, personal communication 1987). The site was found to conform to survey descriptions, except that substantial modern use of the area, evidenced by broken beer bottles, was reported. Tens to hundreds of flakes were found in each basin. Cores were found in Locus 1.

Subsurface Testing

Subsurface testing consisted only of scraping and bagging the soil and artifacts contained in Loci 1, 2, 3, and 7. An ash stain was noted in Locus 3; excavators suggested it probably was recent. No further information is available.

Comments

The nature of this site makes it likely that numerous reduction events involving high-quality materials are represented. The preference of prehistoric occupants of the area at all time periods for fine, silicified wood as a raw material for projectile points and other intensively worked formal tools (James Rancier, personal communication 1987) suggests that considerable time depth could be present. The site could represent a hunting stand or overlook, a formal tool manufacturing station, a lounging area with casual knapping activities, or all three. Eventual development of complete settlement maps by time period for the Hood Mesa and Farmington Glade areas may permit assessment of the role of locations such as Site FA 5-2 in the occupational and activity system of the area. Material and technological comparisons between the assemblages from Sites FA 5-2, FA 5-1, FA 5-3, and FA 2-9 could prove helpful for further interpretation of the roles of these neighboring sites and of interactions among the people who used them.

FA 5-3

Site FA 5-3 is a sherd and lithic artifact scatter with several concentrations dating to the PII period, and also having possible PI and PIII components. It was assigned the Laboratory of Anthropology number LA 33764.

Location

The site is located in Township 30N, Range 13W, Section 34, at an elevation of 5,710 ft. (1,740 m.). The site lies on the crest of a knoll atop a ridge running off the southwest end of Hood Mesa, a short distance west of the Rio Animas-Farmington Glade divide. It is east of Site FA 5-2 and north of Site FA 5-1, at a distance of about 250 m. from each of those sites. Roads bound the site to the north and east. The site vegetation is composed of scattered juniper, shrubs, and grasses.

Survey Description

On survey, the site was described as a ceramic and lithic scatter deflating out of a ridgetop. The concentrated portion of the scatter was estimated to extend over a 400 sq. m. area, with an overall site area of 2400 sq. m. Research potential was suggested to lie primarily in comparison between this site and the potentially earlier sites nearby.

Testing Procedures

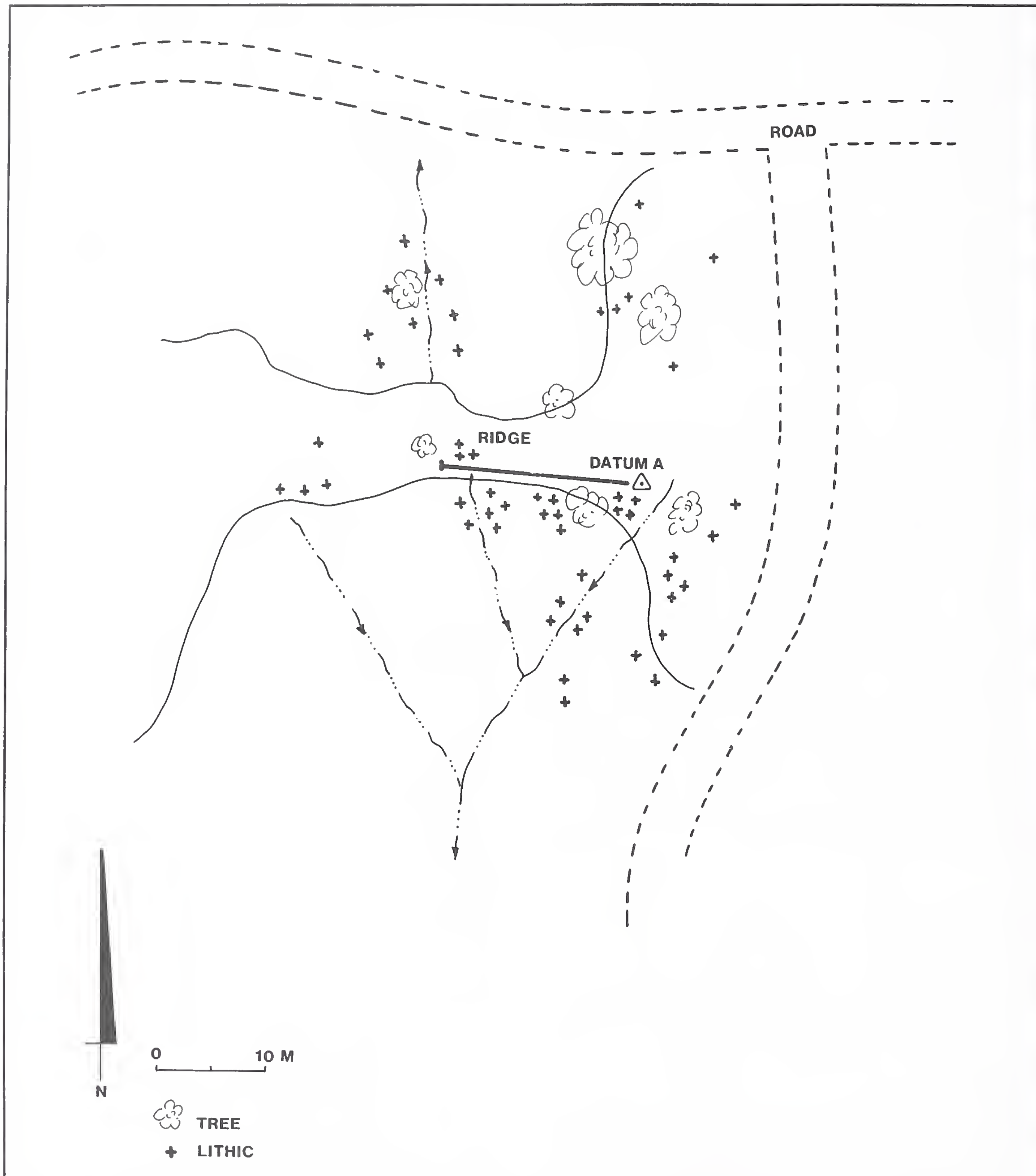
The site was tested on April 8, 1982. Testing consisted of inspecting the site, flagging, mapping and collecting artifact concentrations, and installing eight shovel tests. Datum was established just to the northeast of the main concentration of artifacts (Locus 1). A 15 m. long baseline was laid out west from datum. Collections were carried out within a 15 by 30 m. area centered on the baseline, with items point-provenienced using crossed tapes. Additionally, smaller outlying concentrations were collected. The smaller concentration centers were located relative to datum by tapes and compass directions. Collections were then made within a square area centered on the concentration (Map 5-21). Such collections included: Locus 2, 5 m. southeast of datum (4 sq. m.); Locus 3, 15 m. south of datum (9 sq. m.); and Locus 4, 18 m. west-northwest of datum (1 sq. m.).

Surface Description

Surface inspection revealed that Locus 1 was composed of a northern aceramic subconcentration (9 flakes), a western subconcentration (8 flakes and 6 sherds), a central subconcentration (12 flakes and 12 sherds), and a less-dense southern subconcentration (7 sherds and 4 flakes), which graded south into the Locus 3 concentration (9 sherds and 2 flakes). Locus 2 (4 sherds and 3 flakes) was similar to the adjacent central subconcentration at Locus 1. The northwestern Locus 3 had two sherds and four flakes. Additional uncollected scatters of lower density lying farther west, northwest, northeast, and southeast of datum were schematically indicated on the field map. It is estimated that an additional 50 artifacts are present in these uncollected scatters.

Subsurface Testing

Subsurface testing was limited to a series of eight shovel tests placed westward along the baseline, starting at



Map 5-21. Site FA 5-3 is a sherd and lithic artifact scatter with several concentrations dating to the PII period, and also having possible PI and PIII components.

datum and placed at each even meter interval thereafter. All were barren of ash, charcoal, and artifacts. Bedrock was encountered at varying depths in these tests.

Analyzed Samples

Ceramics (Raish, this volume) collected from this site during survey and testing included (a) whitewares: Mancos B/w (15 sherds), mineral whiteware (1 sherd), and undifferentiated whiteware (14 sherds); (b) redware: polished slipped (1 sherd); and (c) grayware: Mancos Corrugated (8 sherds) and Moccasin Gray (3 sherds). Site FA 5-3 was the only tested site in the Farmington sector to yield the PI diagnostic Moccasin Gray, which dates to A.D. 775-900. The pieces collected exhibited 13 mm. neck band width (early PI) and refired to yellow-red. The refiring sample of Mancos B/w (A.D. 950-1150) also refired to yellow-red. Raish (this volume) suggests that refiring color indicated local manufacture of both pieces.

Temporally, Mancos Corrugated (A.D. 900-1200) is coterminous with Moccasin Gray and subsumes the temporal range of Mancos B/w. This double overlap suggests either that multiple components over the PI to early PIII period are present or else that a single occupation very early in PII times could be hypothesized.

Over all types, a total of at least 24 vessels were present in the collection, of which half were decorated jars, 20.8% were plain or utility jars, and 29.1% were decorated bowls. Raish considers that these frequencies may indicate that the site was reused as a day-use gathering area.

Comments

A possibly significant trend was noted in distributions of lithics versus ceramics. It appears that lithic items are more common in the northern site area, while ceramics increase in frequency from the central site ridge to the south. This difference in distributions may reflect either multicomponency or differences in activity areas. Raish's suggestion that the site is a reused gathering site seems appropriate.

FA 6-1

Site FA 6-1 is a large scatter of tested cobbles and quarrying debris apparently relating to large tool manufacture. PII and PIII ceramics and stone ax fragments indicate an Anasazi component is present. The site was assigned the Laboratory of Anthropology number LA 33758.

Location

The site is located in the northwest corner of Township 30N, Range 12 W, Section 19, atop the Hood Mesa drainage divide. The site is set on a southeasterly slope at the head of the Hood Arroyo drainage, at an elevation of 5,925 ft. (1,806 m.). As no overview photographs or vegetation notes have been located, the vegetation of the site area cannot be characterized, but probably resembles that of Site FA 2-7, which lies in a similar setting a mile to the southwest.

Survey Description

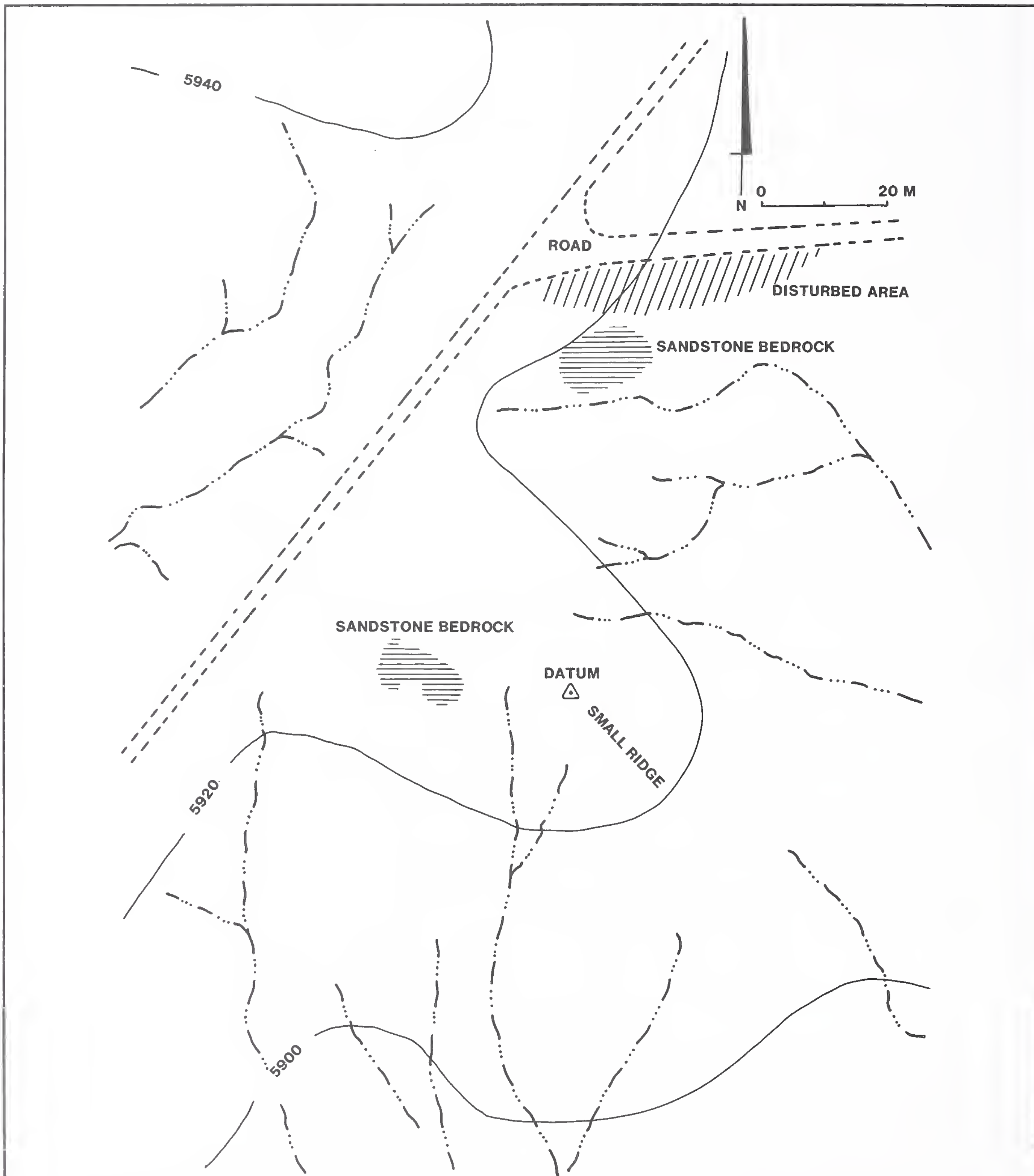
The site was characterized on survey as a large (13,000 sq. m.), sparse, aceramic scatter of flakes, cores, axes, and tested cobbles. The dominant lithic material was reported to be basalt. Most artifacts were reported to be concentrated in a ridge-top core area of 5,400 sq. m., surrounded by dispersed slope-washed scatters on adjacent slopes. The site was reported to be eroded and heavily impacted by dumping and by the construction of a bladed road. The assemblage on the site was thought to present an opportunity to study Archaic quarrying and reduction assemblages. A basalt core, a ground ax bit fragment of micaceous quartzite, a hammerstone/chopper of syenitic igneous rock, and at least six other artifacts were collected.

Testing Procedures

The site was tested on March 1, 3, 4, and 5, 1982. Testing consisted of walking close transects of the entire site with flagging of artifacts in the denser core area, installing three datum points, mapping of site topography and of flagged artifacts by compass reading and pace measurements, collecting core area artifacts, and excavating eight shovel tests in frozen soil. Shovel test fill was screened.

Surface Description

On inspection, the site was found (Map 5-22) to correspond well with the survey description, except that a few PIII ceramics were found. The primary scatter extended over a distance of approximately 90 m. north-south and 80 m. east-west, with the densest concentrations being found between Datum 1 (the survey tag) on the southeast and the road on the northwest. Localized concentrations in excess of 1 item/10 sq. m. were found at Datum 1 and just to the south of Datum 3. Only a few items were mapped at distances in excess of 40 m. from the nearest datum point, but field notes indicate that a very sparse scatter, having densities on the order of 1 item/1,000 sq. m., was present out from the datum points for perhaps 100 m. in all directions. It is esti-



Map 5-22. Site FA 6-1 is a large scatter of tested cobbles and quarrying debris apparently relating to large tool manufacture. PII and PIII ceramics and stone ax fragments indicate an Anasazi component.

mated that perhaps 100 outlying artifacts were not collected. These are reported to have been similar to the items collected from the denser areas. A cobble outcrop is present just north of the site, which may have provided the source for much of the igneous cobble materials worked on the site.

The surface assemblage collected was composed of 215 debitage pieces; 29 cores, one of which was recorded as chert; a pebble core; 2 core tools; 2 flake tools; a tool of an unspecified type; 2 cobbles; 1 maul; 1 hammerstone; and 1 stone exhibiting pecking. Also collected were six clustered sherds from a Mancos Corrugated jar drop and two seperated sherds of Mesa Verde B/w.

Subsurface Testing

Subsurface testing consisted of excavating eight shovel tests (Table 5-10). A flake was recovered in the upper 20 cm. of Test 5, 16 m. northwest of Datum 2. Pollen samples were collected from the surface and subsurface in Tests 2 and 3, respectively 5 m. east and 20 m. north of Datum 1. Neither ash nor charcoal was encountered in any test. Bedrock was difficult to identify because of the complex sand and clay stratigraphy of most tests and also because the soils were frozen, but it appears that bedrock generally consisted of shales and variably-colored sandstones lying at depths of 20-30 cm.

Comments

It appears clear that quarrying and working of the predominantly igneous cobble deposits outcropping near the site was a primary activity. Cores and finished tools were probably removed from the site.

A substantial fraction of the isolates found in the foothills section of the Farmington survey area seem to have been axes, adzes, mauls, and other expedient or formal, hafted, cutting or breaking tools. At least one worn and broken ax bit was found and collected in the survey of Site FA 6-1. The foothills section was probably a primary source of fuelwood and small timber. Site FA 6-1 may have been an important location at which igneous cobbles were shaped into these tools, and at which older broken tools were discarded.

It is reasonable to assume that this activity was carried out over a long span of time and was not restricted to the period of A.D. 900-1300 or later suggested by the rare ceramics found on the site. Equally, the site cannot be viewed as the purely Archaic manifestation suggested by the survey crew.

FA 6-5

Site FA 6-5 is a rockshelter and associated lithic scatter. It has not been assigned a Laboratory of Anthropology number.

Location

This site is thought to be located southeast of Site FA 6-1, in Section 19 or the western portion of Section 20. Precise locational data are unavailable.

Table 5-10. FA 6-1, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	5	0	25	-	?
2	1	5	90	30	2P	No
3	1	20	0	10+	2P	?
4	2	0	0	30	-	Yes
5	2	16	339	20	1F*	Yes
6	3	11	65	22	-	Yes
7	3	10	290	35	-	?
8	3	0	0	?	-	?

Key: F-Flake, P-Pollen sample

*upper 20cm.

Survey Description

The site was described on survey as a recent fire hearth associated with charcoal stains, a core, two flakes, and numerous bones. These artifacts were scattered across the slope in front of and in the entrance of a small rockshelter containing a recent woodrat midden (Fig. 5-20). Some of the bones were reported to be burned, and charcoal was present in the shelter mouth. The site was reported to be undisturbed or slightly disturbed by pot hunting. A Mesa Verde Corrugated sherd was reported near the shelter mouth and appears to have been collected, as were an unknown number of bone and lithic items.

Testing Procedures

The site was tested on April 16 and 28, 1982. Testing consisted of installing two datum points, flagging of artifacts, mapping with pace measurements and compass readings, collecting of all artifacts encountered, installing five shovel tests, and excavating a 0.5 by 0.5 m. test pit in the shelter fill. All fill excavated was screened.

Surface Description

On inspection, the site was found to consist of an artifact scatter extending 30 m. south, 35 m. west, and 60 m. north of a west-facing rockshelter with one large and several small openings. The north site area was crossed by a powerline slash, paralleled on the north by a two-track trail (Map 5-23). Several erosional rills cut the site, draining to the west.

The shelter was about 5 m. deep from front to back and was filled by sediments to within less than 1 m. of the roof. The roof of the shelter appeared burned and smudged. Northwest of the shelter, an artifact scatter was recorded and collected. The scatter consisted almost entirely of flakes and overlapped a second scatter near the shelter. The scatter near the shelter contained relatively few flakes but numerous cores and core tools. In all, 23 flakes, 7 cores, 4 core tools, and 1 piece of ground stone were collected from the surface. No ceramics were noted.

Subsurface Testing

Five shovel tests were dug outside the shelter (Table 5-11). These were unproductive except for Test 3, which produced a burned rabbit bone. Charcoal was reported in the area of Shovel Tests 1, 2, and 3. Test 4, 8 m. west of the shelter mouth, encountered sandstone bedrock at 20 cm. depth. Test 5, 4 m. to the north, went to 40 cm. and was abandoned when a large cobble was encountered.

A single test pit measuring 0.5 by 0.5 m. was excavated inside the shelter overhang. It was located with its northwest corner at 2 m. north and 3.5 m. east of the datum. Twelve bones and a possible ground stone piece were collected from loose surface fill in the test pit. The first compact level, Level 1 (0-20 cm.) was composed of woodrat feces (Stratum 1), burned and unburned bone, loose charcoal, and modern trash (apparently uncollected). It extended from the surface to 12-15 cm. depth and graded into a loose gray fill (Stratum 2), also excavated as part of Level 1. Over 30 bones and several flakes were collected from Level 1.

Level 2 (20-30 cm.) fill was 1-2 cm. of the gray fill overlying loose yellow sand (Stratum 3), which terminated in bedrock at 22-30 cm. depth everywhere but at the northern edge of the unit (Fig. 5-21), where bedrock disappeared. Three bones and a possible flake were collected from the deep crack or bedrock ledge fill along the north edge in Level 2. A floatation sample was collected from the upper part of Level 2 and a pollen sample was taken at the Level 1-2 contact. The deep crack or ledge fill was apparently excavated to 50 cm. depth, but no artifacts are reported for the deeper levels. These lower level excavations were apparently only a few centimeters wide.

Analyzed Samples

No analysis of ceramics is reported for this site, and neither pollen nor floatation samples were submitted. Bone from the shelter test, 55 pieces in all, was analyzed by Bertram (this volume) who found an archaeofauna consistent with and diagnostic of human occupation, mixed with carnivore- and woodrat-introduced pieces. Present in the pooled samples were prairie dog, woodrat, cottontail, jackrabbit, porcupine, and deer. Of these forms, only the prairie dogs (three individuals: one adolescent, one adult with scraps of flesh adhering, and one immature form) and the porcupine (flesh adhering) did not exhibit evidence of human processing. Roasting was observed on bones from the following species: woodrat (one individual), jackrabbit (two immature and one mature individuals), cottontail (two or three individuals, including at least one very young juvenile), and deer (two individuals: a mature buck and a mature doe).

Canid gnawing was present on the aged porcupine mandible, and other pieces display fecal polish from carnivore or human digestion. Definite human gnawing was present on cottontail and jackrabbit meat parts; the gnawed cottontail ilium had been disposed of in a fire after the meat was gnawed away. Canid gnawing may have been produced either by dogs or coyotes.

The rabbit and hare bones are consistent in size and fusion characteristics. This leaves little doubt that these

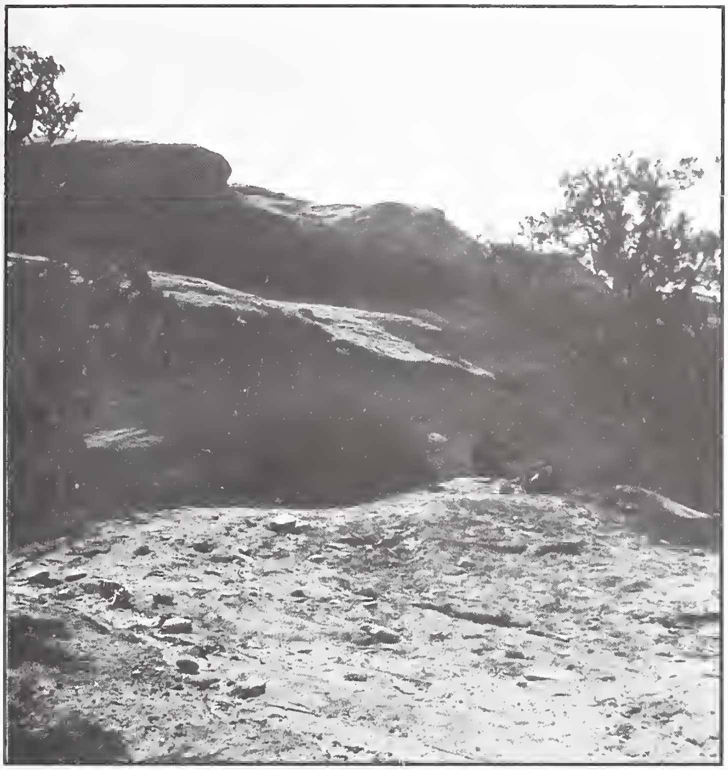


Figure 5-20. Site FA 6-5.

samples include apparently unburned, roasted, and both cooking- and disposal-burned pieces from the same individuals. Such bones would most likely be found in a campsite midden. With the exception of the prairie dog and porcupine materials, the assemblage is certainly cultural. The possibly noncultural pieces may simply be lightly stewed or roasted pieces or items discarded before cooking. Mild cooking, of course, is undetectable on bone. Natural fires in a woodrat midden alone cannot account for the observations reported.

Comments

The rockshelter at Site FA 6-5 appears to have been insufficiently tested. The clearly cultural archaeofauna, the undetermined depth of bedrock at the north end of the test pit, and the associated artifacts indicate that mixed but otherwise undisturbed cultural deposits are present within and perhaps in front of the shelter.

Conclusions

This report has summarized observations made in testing of 22 prehistoric sites, carried out as part of the Elena Gallegos Land Exchange Project. The data base for preparation of this summary included survey and testing phase observations and results and also the final results of laboratory and specialist analyses of ceramics, faunal and macrofloral remains, pollen collections, and radiocarbon dating. Summary data for chipped and ground stone assemblages presented here, by contrast, reflect field observations and preliminary laboratory results only; except insofar as lithic analysis results may modify or enhance preliminary interpretations, the site summaries may be viewed as complete.

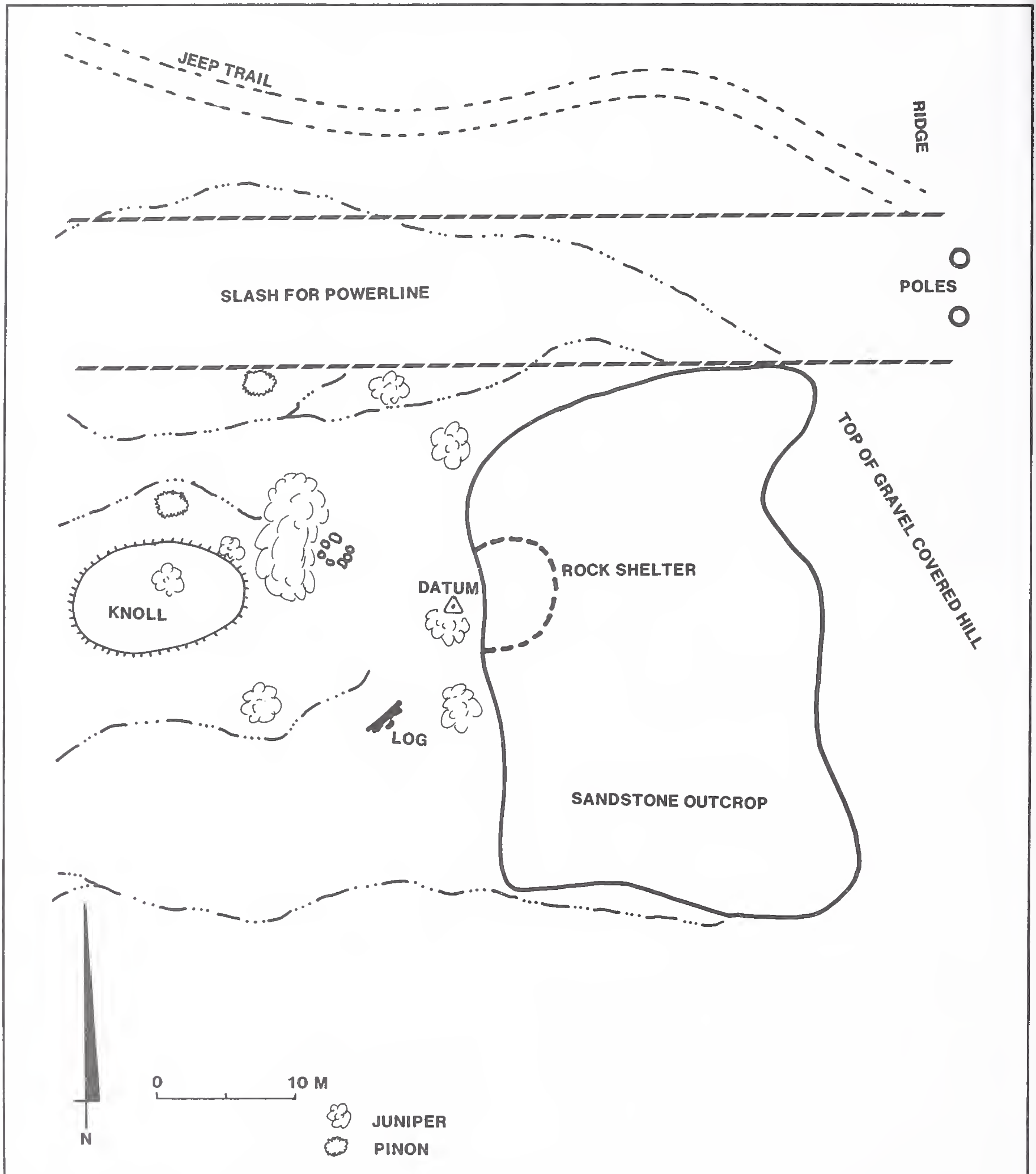
Chronology

The sites tested in the 1982 program produced data suggesting that a range of occupational complexity is represented (Table 5-12). This range extends from small and rather easily interpreted occupations, such as at Site FA 2-19, to probable multicomponent occupations extending over a large area, such as at Site FA 2-8. The occupations recorded appear to be classifiable mainly as specialized activity sites of a range of types, but more intensive, long-term occupations may also be present. Temporal components range from Middle Archaic to PIII and possibly later.

Dates inferred from ceramics and projectile point styles did not, in general, prove to be consistent with dates determined from radiocarbon samples. Inconsistency between dates based on projectile point styles and other dating methods is unsurprising, as I have recently argued (Bertram 1987). Most larger projectile point styles seem to pertain to a much wider and generally later temporal range than has been commonly supposed. Association between most points and other chronological indicators is weak at best on the sites tested in the Farmington sector; the seemingly inconsistent point-style dates may indicate multicomponency.

Inconsistent dating evidence from ceramics and radiocarbon may also indicate multicomponent occupations. This even seems to be the case within a single feature (FA 2-8, Feature 3), where complex stratigraphy suggested that three or four superimposed hearths might be present; associated radicarbon dates indicated both Late Archaic-BMII and BMIII-PI use. There also seems to be little reason to doubt the validity of the two very different dates from Site FA 2-16, one of which accorded well with the PII and PIII ceramic dates.

Of course, the study area must have been heavily used during the PII-PIII occupation of the Farmington area. Insofar as the Anasazi sought upland wild resources in



Map 5-23. Site FA 6-5 is a rockshelter and associated lithic scatter.

Table 5-11. FA 6-5, Shovel Test Results (tests with detailed descriptions only)

Shovel Test No.	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
1	1	4*	165*	?	C	?
2	1	0*	0*	?	C	?
3	1	4*	10*	?	C,B	?
4	1	6	270	20	-	Yes
5	1	7	305	40	-	No

Key: B-Bone, C-Charcoal

* Approximated from field sketch

ways similar to their Archaic predecessors, it is to be expected that most Archaic sites would have been reoccupied by Anasazi hunting and gathering task groups. In fact, at least 12 of the 22 sites described here have relatively definite ceramic associations but only perhaps seven sites are unambiguously aceramic. It should not be assumed that aceramic sites are not Anasazi sites. Of the 14 radiocarbon dates obtained, only one or two are unquestionably referable to the PII-PII peak occupation period of the area, perhaps five are marginally referable but rather early, and seven cannot be referred to the post-Basketmaker period at all.

Subsistence

If we elect to accept the radiocarbon dates as valid ages for associated paleobotanical materials, then the corn at FA 1-2, dated at 2255 B.C. (TX-4916), represents one of the earliest dates for corn usage in the Southwest. The other two occurrences of corn at the tested sites are less remarkable: FA 2-8 Feature 4, dating to BMII times, and FA 2-16, Feature 2, which dates BMII-BMIII times with possible PIII intrusion.

Other paleobotanical associations were unsurprising, given the upland setting of the study area and its inferred past function as a wild-resource gathering area and hinterland of the nearby river valley occupation zone. Evidence for processing of a variety of locally available wild plants commonly co-ocurred, as at FA 1-2; FA 2-8, Feature 3; and FA 2-16, Feature 2. The last site mentioned produced the only probable non-local plant remains; these were cottonwood or willow charcoal, which may indicate fuel transport from the nearby riverine woodlands.

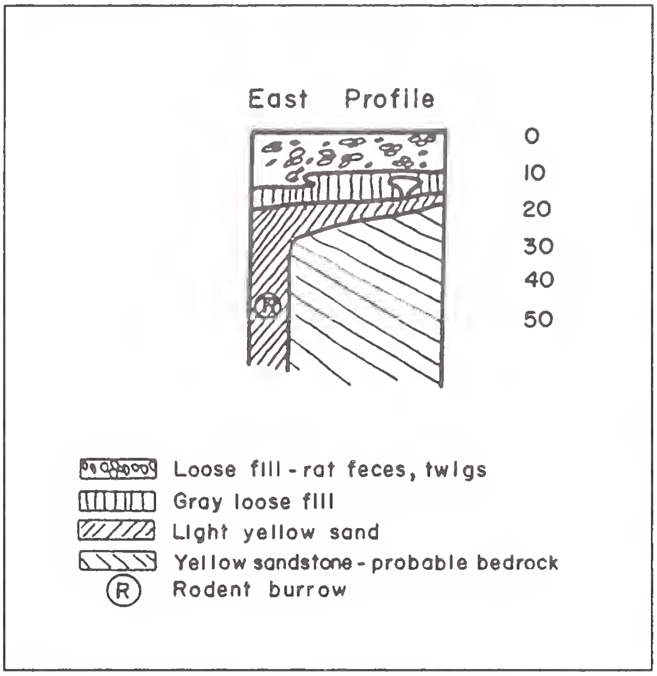


Figure 5-21. Site FA 6-5, east profile of test pit.

In every case where preservation was acceptable and where collections were reasonably large, archaeofaunal materials indicated the consumption only of locally available large and small forms. All or most of the larger animals taken seem to have been deer; smaller processed forms included the usual rabbits, hares, and woodrats.

Table 5-12. Site Summary Characteristics

Site Number	Elevation (m)	Setting	Burned Rock Scatters	Hearths	Age Inferred	Vessels by Group
1-1	1774	Ridge	4	1	M.Ar, PIII	UJ:4-5
1-2	1768	Ridge	6+	1	M.Ar	-
1-5	1743	Ridge	1	1?	M.Ar	-
1-9	1765	Ridge	6	-	?	-
1-10	1760	Ridge	3	-	?	-
2-6A	1790	Slope	-	-	?	-
2-6B	1780	Slope	1	1	BMII, PII	UJ:1
2-7	1800	Ridge	-	1-2	PI- PIII	DB:1+ DJ:1+ D?:3-
2-8	1777	Slope	-	4+	BMIII- PII	UJ:4
2-9	1725	Slope	1?	1?	?	UJ:1?
2-10	1753	Slope	-	-	?	UJ:1? D?:1
2-11	1765	Slope	1+	4+	?	UJ:1 D?:1
2-12	1676	Bottom	1	-	?	-
2-15	1707	Ridge	1	1?	?	-
2-16	1692	Slope	1	1?	BMII, PII- PIII	UJ:4+ D?:1
2-17	1684	Slope	4	1	?	-
2-18	1739	Ridge	1	-	?	-
2-19	1695	Slope	-	-	PII	DB:4
5-1	1739	Ridge	-	1	?	UJ:1?
5-2	1731	Slope	-	-	?	-
5-3	1740	Ridge	-	-	PI- PIII	UJ:5 DJ:12 DB:7
6-1	1806	Slope	-	-	PII- PIII	UJ:1 D?:1
6-5	?	Slope	1?	1	?	UJ:1

Key: UJ-Utility Jar, DB-Decorated Bowl, DJ-Decorated Jar, D?-Decorated, unknown vessel type, M.Ar-Middle Archaic
?-Age uncertain

Table 5-12. Site Summary Characteristics (continued)

Site Number	Mano (no.)	Metate (no.)	Ground Stone (no.)	Ax/ Maul (no.)	Chopper (no.)	Cobble Tool (no.)
1-1	1	-	2	-	1	1
1-2	3	1+	18	-	3	-
1-5	-	-	-	-	-	1
1-9	2	-	1	-	-	-
1-10	1	-	-	-	-	-
2-6A	-	-	-	-	-	-
2-6B	-	-	-	-	2	1
2-7	4+	-	2	1	-	4?
2-8	-	-	4	2	2	-
2-9	-	-	4	-	-	-
2-10	-	-	1	2	-	-
2-11	-	-	1	-	-	-
2-12	-	-	2	-	-	-
2-15	20	-	several	-	2	-
2-16	1?	-	1+	-	3	-
2-17	1	-	-	-	1	-
2-18	several	several	-	-	-	-
2-19	-	1	-	1	-	-
5-1	many	-	-	-	-	-
5-2	-	-	-	-	-	-
5-3	-	-	-	-	-	-
6-1	-	-	-	2	1	-
6-5	-	-	1	-	-	-

Table 5-12. Site Summary Characteristics (continued)

Site Number	Debitage Density (relative)	Core (no.)	Core Tool (no.)	Plant Foods Processed	Animal Foods Processed
1-1	moderate	2	3	-	L,A
1-2	moderate	2	4	C,W	-
1-5	moderate	4	-	-	-
1-9	low	-	-	-	-
1-10	low	-	-	-	-
2-6A	moderate	1-3	-	-	-
2-6B	low	1	-	-	-
2-7	moderate	20	-	-	-
2-8	moderate	3	-	C,W	L,A,R
2-9	low	17	several	-	-
2-10	moderate	6	-	-	-
2-11	moderate	5	-	-	-
2-12	high	3	-	-	-
2-15	low	1	-	-	-
2-16	low	6	-	C,W	L,A,R
2-17	moderate	3	-	W?	L,A
2-18	high	-	-	-	-
2-19	low	2	-	-	-
5-1	moderate	-	-	-	-
5-2	very high	many	-	-	-
5-3	moderate	-	-	-	-
6-1	moderate	29	2	-	-
6-5	moderate	7	4	-	L,A,R

Key: A-Artiodactyl, C-Corn, L-Lagomorpha (rabbits and hares), R-Rodent, W-Wild plants

Technology

Assemblage variability in the Farmington tested sites is considerable. Tested sites were ceramically dominated by utility wares (FA 1-1, FA 2-8, and FA 2-16) or by decorated wares (FA 2-7, FA 2-19, and FA 5-3), but no sites with relatively equal quantities of decorated and utility vessels occur. Most decorated vessels were bowls; FA 5-3, however, had as many decorated jars (12) as decorated bowls (7) and utility vessels (5) combined.

Most sites were reported to possess a wide range of ground and large chipped stone items, but FA 5-2 seemed to contain mostly or entirely small debitage. A tendency for sites with axes to have few other lithic artifacts besides cores and unmodified debitage is probably not significant; these sites (FA 2-7, FA 2-8, FA 2-10, FA 2-19, and FA 6-1) tend to lie at higher elevations near or on outcropping cobble deposits which may have provided the quarry sources for both simple core reduction and ax manufacture. Curiously, axes seem to be negatively associated with manos and other ground stone tools, yet possible mano quarries or caches (FA 2-15 and FA 5-1) occur in settings similar to the possible axe and core quarry sites.

A trend was recognized in the setting of sites having large quantities of ground stone. Of the 10 ridge-top sites described, 8 have 3 or more ground stone items, but of the 13 non-ridge-top sites (counting FA 2-6A and FA 2-6B separately), 11 have 2 or fewer definite ground stone items reported. This trend is clearly significant in the statistical sense, but archaeologically it might most appropriately be taken to signify only that ridgetops are more likely to be eroded and to retain manos in their surface assemblages than are slopes or bottomland settings.

Summary

It seems evident that the primary activities carried out at the sites in this study were related to upland special-purpose exploitative forays from residential sites located in the adjacent river valleys. Resources accessed at these sites seem to have included fuelwood, timber, shelter, cobbles of igneous and other durable stone, wild game, and wild plants. In some periods, the Farmington uplands may also have been important as farming localities, resulting in fieldhouse occupations. No evident temporal trends in the use of resources could be confidently inferred from the tested site data, due to the probable multicomponency present in many of the tested sites. This multicomponency appears to reflect occupations beginning in the Middle Archaic and including more intensive use during the BMII through PIII periods.

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Chapter 6 • Excavated Sites FA 3-6, FA 1-6, FA 3-3

Carol Raish

Introduction

Four sites were selected for excavation from the Farmington portion of the Elena Gallegos Project. Three sites whose major components are Basketmaker III-Puebloan (FA 3-6, FA 1-6, FA 3-3) are reported in this section. Site FA 2-13, a Late Archaic-Basketmaker II open campsite, is the subject of a separate report (Schutt, this volume). Sites were selected for excavation primarily based on their potential to address the research design. The excavations reported here were directed by the author.

The sites discussed here consist of an open campsite and two pitstructures. One of the pitstructure sites (FA 3-3) also contains a variety of apparently unassociated activity loci showing evidence of repeated occupation over a considerable time span. All of the sites are multicomponent.

FA 1-6 and FA 3-3 are located north of Farmington on the southeast slope of Hood Mesa between the Animas and La Plata Rivers. Farmington Glade Arroyo cuts through the area running northeast-southwest. FA 3-6 is situated east of Farmington and the Animas River in the uplands 3.2 km. north of the San Juan River. As discussed by Toll (this volume), the three sites are located in areas encompassing both Coniferous Woodland and Great Basin Desert Shrub vegetation (Donart et al. 1978). Sparse grass and forb understories are scattered with yucca, prickly pear cacti, shrubs, and scrubby trees. The sites at higher elevations (FA 1-6 and FA 3-3) are in areas where pinyon is also present.

General Field Methods

The excavation methods used were designed specifically for each of the three sites and were conditioned, in part, by prior testing conducted on the sites. Certain procedures were carried out on all sites, however. Each of the sites was systematically surface-collected during the testing phase of the project, and re-surface-collected for remaining or recently exposed items during the excavation phase. Items were either point-plotted or collected by grid square during both testing and excavation phases. (Items observed during the survey phase were grab-sampled for diagnostic artifacts.) Artifacts were collected and grid units set in by compass and pace or tape during the testing phase. During the excavation phase, a 10 m. baseline grid oriented to magnetic north was set in with a transit on each site or site locus.

Excavation units and surface collection units were then set in with tapes off the main grid. The surface collections were made either from these grid units, or provenience-plotted with a transit and stadia rod or tape. The number and extent of surface artifacts conditioned the manner in which they were collected. Dense, concentrated scatters were collected by grid unit while lighter, more diffuse scatters were point-plotted. The latter technique was quicker for scattered items than laying out a grid over a large area. Artifacts were collected and bagged by category in the field. Site maps showing surface collections, excavation units, and features were made for each site. Contour maps of each site were produced by Joe Rivera, Forest Service Surveyor, and Steven Street.

During the excavation phase, the following forms were filled out for each site: environmental information sheet, excavation unit log, field specimen catalogue sheet, strata/level form, feature form, and photo log. In addition, separate site logs were maintained for all samples.

Radiocarbon and dendrochronological samples were taken whenever possible and appropriate. All radiocarbon dates have been calibrated to the tables published in Klein et al. (1982). Several thermoluminescence and archaeomagnetic samples were also taken. A set of pollen, floatation, and soil samples was taken from every feature. When features could be separated into distinct strata, pollen and floatation samples were taken from each stratum. In the case of structures, all intra-mural features were sampled, as well as a portion of the postholes. Samples were taken from several locations within the roof fall/wall fall and floor levels. Pollen samples were taken from near the center of the floor and from corner areas along the wall. Pollen samples were taken with a clean trowel as soon as an area was uncovered. Additionally, a surface-pinch pollen sample was taken on each site to check on the modern pollen rain.

Opening and closing photographs were taken of each excavation unit and each feature. Any pertinent cultural remains were also photographed. In general, excavation was conducted with shovel and trowel. Features, floors, and special test areas were troweled, while structure overburden was removed with a shovel. All material was screened through 1/8 inch mesh. Features such as hearths and roasting pits were normally excavated as follows: First, a quarter section was removed to determine feature stratigraphy. Then, the adjacent quarter section was removed by the levels defined in the first quarter cut. This allowed both N-S and E-W profiles to be made. The remainder of the feature was removed by level after the profiles had been drawn. Excavation techniques for larger areas and for structures varied according to the site, and are discussed under the special sections for each site.

On all sites each of the features or structures with surface indications was completely excavated, with the exception of one activity locus on Site FA 3-3. Due to time constraints this locus was only tested. All observed stain areas and heavy artifact concentrations were also tested. Testing for subsurface features with no surface indications was conducted on both FA 1-6 and FA 3-3. This sort of testing was not undertaken on FA 3-6 due to time limitations.

The above information is a basic summary of methods and techniques used during the excavation phase of research in the Farmington study areas. General procedures used during the testing phase are presented in the section of this volume dealing with the testing program and the tested sites. Testing that was conducted on the sites that were eventually selected for more complete excavations (FA 1-6, FA 3-3, FA 3-6) is discussed in the individual site descriptions that follow. These descriptions follow the format used in Hogan and Winter (1983).

Lithic and groundstone artifacts from these sites are described and analyzed by Schutt (this volume).

FA 3-6 (LA 33753)

Setting

Site FA 3-6 is a scatter of lithics, ceramics, groundstone, and fire-cracked rock, with a diffuse surface ash stain. A second lithic scatter was located approximately 50 m. southwest. The site is located on a well-drained mesa slope 3.2 km. north of the San Juan River and ca. 350 m. east of a broad, sandy wash. Sandstone outcrops appear in small erosion channels on the site and in the general vicinity. There is ongoing wind and water erosion. The artifact scatter is located on a stabilized sand dune sloping to the west (Fig. 6-1).

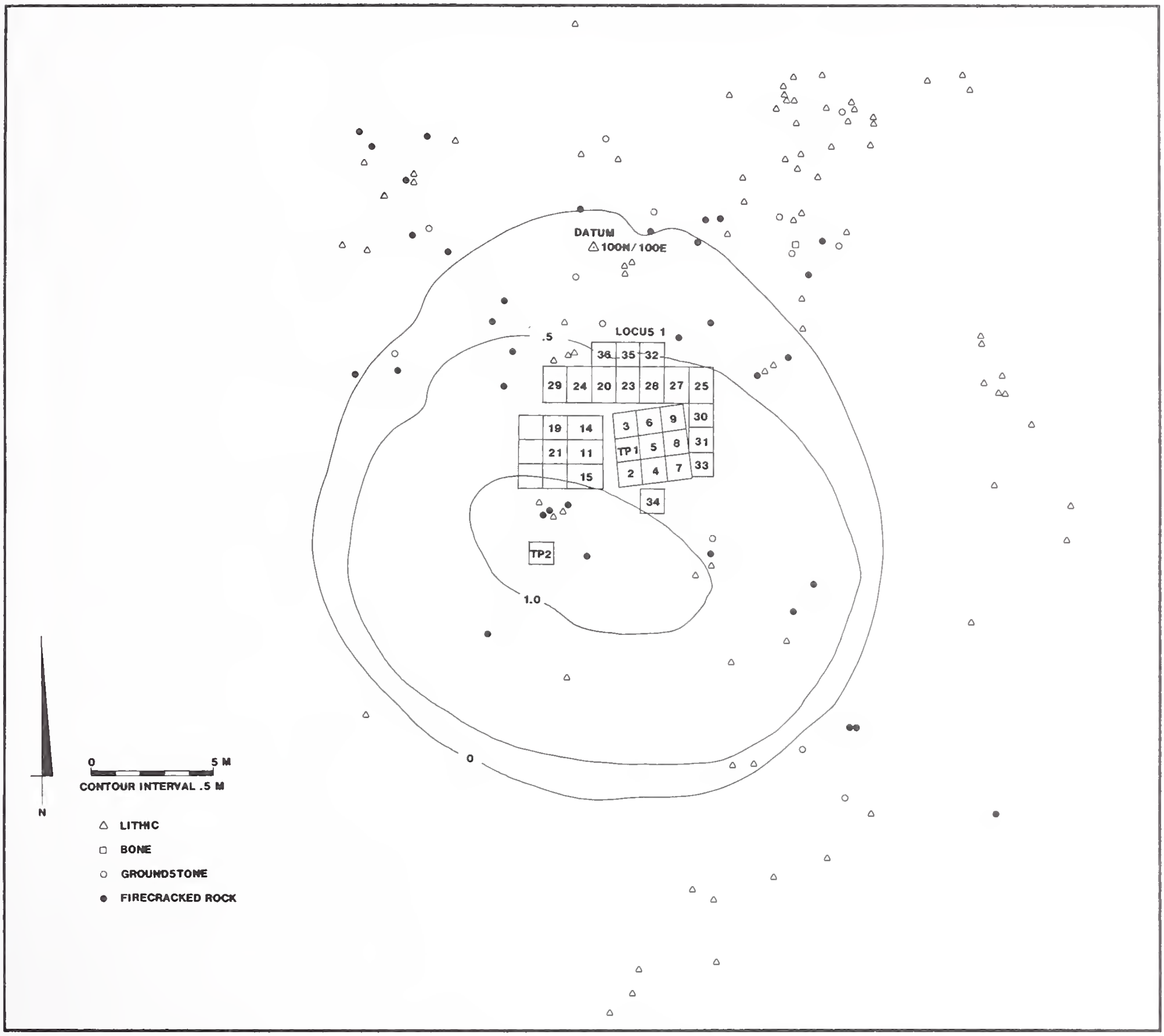
Vegetation in the immediate vicinity of the site consists of juniper [most are Juniperus osteosperma, but some are Juniperus monosperma (Toll, this volume)], Mormon tea, rabbitbrush, snakeweed, bitterbrush, sage, yucca, prickly pear, and various sparse grasses and forbs.

Testing and Excavation Methods

Site FA 3-6 was reported from survey as a lithic scatter consisting of both chipped and ground stone. During the testing phase, the main lithic, fire-cracked rock, and ash stain area (Locus 1) was tested. A cobble cluster on a small knoll, also in Locus 1, was also tested for a possible structure. Testing was accomplished in the following manner. Locus 1 was mapped, photographed, and surface-collected. A 3 m. by 3 m. area over the densest stain and artifact concentration was collected as a unit, while the remainder of artifacts were point-plotted using compass and tape. Shovel tests were put in along a 15 m. baseline running N-S along the western edge of the stain, and extending for 7 m. north and 5 m. south of the stain. The 3 m. by 3 m. unit was then shovel-skimmed down to 10 cm. below ground surface in the eastern half of the unit and ca. 20 cm. in the western half, to define the stain area more completely. The majority of the ash stain was confined to the western half of the unit. All material was screened through 1/8 inch mesh and approximately 150 lithic artifacts were recovered. No source of the stain was discovered. At this point, the larger 3 m. by 3 m. unit was broken down into 1 m. by 1 m. units, one of which was excavated 20 cm. further in two 10 cm. levels as Test Pit No. 1. At this level, compacted sand with no evidence of the stain was reached and excavation ceased. Auger tests were conducted to 30 cm. below this level, with negative results. Materials from TP No. 1 and the auger tests were also screened through 1/8 inch mesh.

Test Pit No. 2 was also a 1 m. by 1 m. unit which was excavated in the area of the cobble concentration. This pit was taken down 50 cm. in one 20 cm. level and three 10 cm. levels. A small charcoal stain was noted in a corner of the pit at ca. 20 cm. below surface. The stain

Figure 6-1. Site FA 3-6 looking south.



Map 6-1. Site FA 3-6, Locus 1.

disappeared within 10 cm. Continued excavation revealed no further cultural remains. Excavation was discontinued at 50 cm. below surface. Four test holes that went down another 30 cm. were placed in the unit, but only sterile soil was found. All materials from TP No. 2 were also passed through 1/8 inch mesh. At this point, testing was discontinued and the site was scheduled for more complete excavation.

The objectives of the excavation phase were to continue examination of the stain area to determine the source of the stain, and to complete excavation of the cobble concentration to determine if a structure was present. In addition, the excavation crew noted a second small lithic scatter 50 m. southwest of the ash stain area. This lithic scatter and its surounding area were also excavated as Locus 2. Map 6-1 shows the excavation units of Locus 1.

Before excavation began on the site, surface materials on Locus 1 were again collected. Fire-cracked rock was plotted but not collected. The location of fire-cracked rock and remaining artifacts, combined with the information obtained from the surface collection made during testing, confirmed the opinion that there is one major artifact and fire-cracked rock scatter in Locus 1. This is also the area of the ash stain. This area was excavated by completing the original nine 1 m. by 1 m. units set in during testing. Nine additional 1 m. by 1 m. units and 10 1 m. by 1.5 m. units were added to define fully the cultural layers and determine the source of the stain. The units were also designed to uncover any artifacts and activity areas in association with a possible hearth. These units were excavated to a depth of 20-30 cm. below ground surface, or ca. 10 cm. into sterile soil below the stain layer. One unit was excavated 1 m. below ground surface into hard, compacted sand/silt with heavy caliche deposits and gravel, to test for further possible cultural remains. Two other units were excavated to 50 cm. below surface for the same reason. No further cultural remains were found below the level of the stain. Features considered to be the source of the staining are discussed in the following section.

A 1 m. by 2 m. unit, excavated as separate 1 m. by 1 m. units, was placed over the small cobble concentration area, also in Locus 1. This unit, in combination with the 1 m. by 1 m. unit in the same vicinity from testing, was designed to test for subsurface structural remains, the possibility of which arose from the results of the testing phase. The unit was excavated 50 cm. below ground surface to the beginning of the hard, compacted sand/silt level with heavy caliche deposits and gravel. Eleven flakes and one small piece of burned bone were found in the upper levels of the unit. No features or evidence of structural remains were encountered. Based on the negative evidence from both testing and excavation, it was concluded that no structure was present in the area of the small cobble scatter. No other excavations were conducted in the area, and it will not be discussed further.

The area surrounding the small lithic scatter, designated as Locus 2, was surface-collected, and then the scatter itself was excavated in six 1 m. by 1 m. units. The cultural remains, which consisted of chipped and ground stone, and scant ceramics, were found within a few centimeters of the surface. No definite staining or features besides the artifact concentration were found. Excavation in one of the units was carried down to 40 cm. below surface, with only sterile soil found. The other units were excavated to 20 cm. or 30 cm. below surface with similar results. Locus 2 is discussed further in the following section.

Site Elements

Locus 1, Feature 4*

*Feature numbers do not run consecutively; some numbers are not used.

Feature 4 was a concentration of ash-stained sand, burned sand, and fire-cracked rock within the larger 3 m. by 3 m. diffuse stain. It seems to be the most likely source of the diffuse stain in Locus 1. Excavation within this dense concentration revealed a core area containing the majority of oxidized sand, darkly stained sand, charcoal flecks, and firecracked rock (Map 6-2; Figs. 6-2 and 6-3). This core area measured 60 cm. N-S and 40 cm. E-W at its greatest extent. It was roughly kidney-shaped and 25 cm. deep.

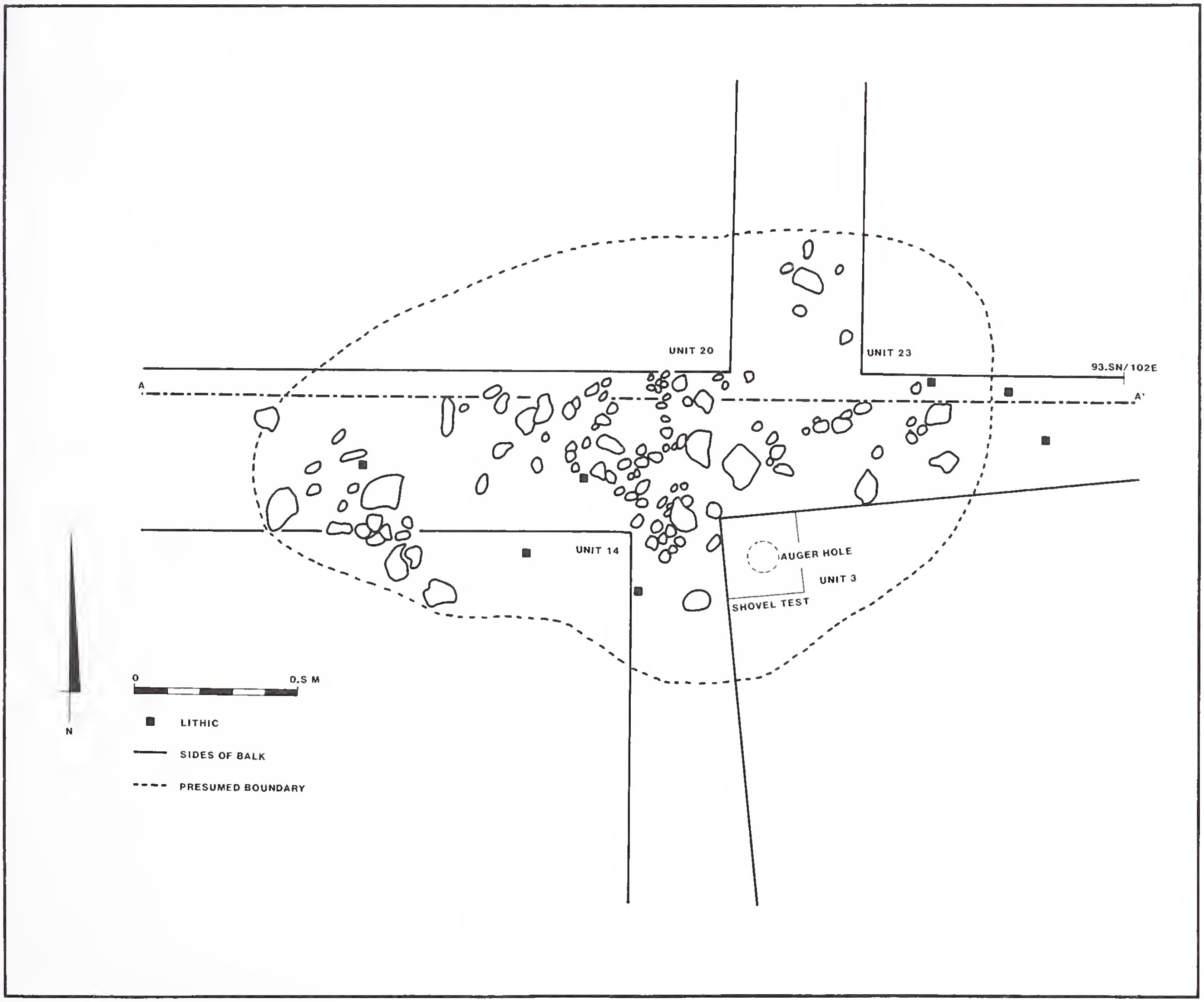
Though oxidized sand was present in the feature, it did not form a conclusive, well-defined, burned surface indicative of in situ burning. The layers of burned sand were somewhat mixed with layers of stained sand and clean sand. This pattern seems to represent a dump where material from a hearth was deposited and later diffused by erosion. Considerable root and rodent disturbance did occur in the core area, however, which could have disturbed a burned surface. Thus, Feature 4 is either a deflated hearth or a dump. A dump area seems the more likely possibility, even though no other in situ burn area was located on the site.

Sufficient scattered charcoal flecks were present to obtain a small radiocarbon sample (1.5 grams). This sample yielded a reading of 1410 + 170 (TX-4780) (Table 6-1). Calibrating this sample by the tables published by Klein et al. (1982) yields a date of A.D. 618 + 263 (95% confidence interval). Floatation samples from the feature (Toll, this volume) indicated the presence of uncharred juniper twigs and seeds, and both charred goosefoot and stickleaf. In pollen samples (Scott Cummings, this volume) juniper and Cheno-am pollen were dominant. Junipers are present on the site, and juniper twigs, largely uncharred, occurred in nearly every sample. These are probably occupational or post-occupational background debris, according to Toll (this volume). Yet carbonized juniper seeds were recovered from some samples, and almost all of the charcoal from the site is juniper. Thus, the presence of juniper in some of the samples from the site is related to cultural activity. The presence of juniper in the samples from this feature, however, appear to be related to natural processes. The charred goosefoot and stickleaf are cultural in origin. Faunal remains from Feature 4 consisted of six burned fragments of long bones from small, small-to-medium, and medium-to-large mammals. One small fragment may be a bird bone. The faunal remains were too fragmentary to be identified in greater detail (Akins, this volume).

Artifacts within the defined Feature 4 area included chipped stone, groundstone and one sherd. The ceramic piece is Mancos Corrugated (A.D. 900-1200) and is more than likely intrusive to the feature (being more recent than other site contents). Scant sherds (10 total), all of which are Mancos Corrugated, are present on the site and are probably associated with Feature 5 which is located 1 m. south of Feature 4. Root and rodent disturbances, as well as erosion, had moved the sherd into Feature 4. The lithics from the feature, as well as the botanical, pollen, and faunal remains, indicate that Feature 4 was used as a cooking and plant-processing locus.

Locus 1, Feature 5

Feature 5 was a small, circular area of very dark, ash-stained sand within the overall diffuse stain. It was roughly basin-shaped and measured 50 cm. N-S and 60 cm. E-W. It was approximately 7 to 10 cm. deep. Feature 5 was located 1 m. south of Feature 4. A few fire-cracked



Map 6-2. Site FA 3-6, Feature 4.

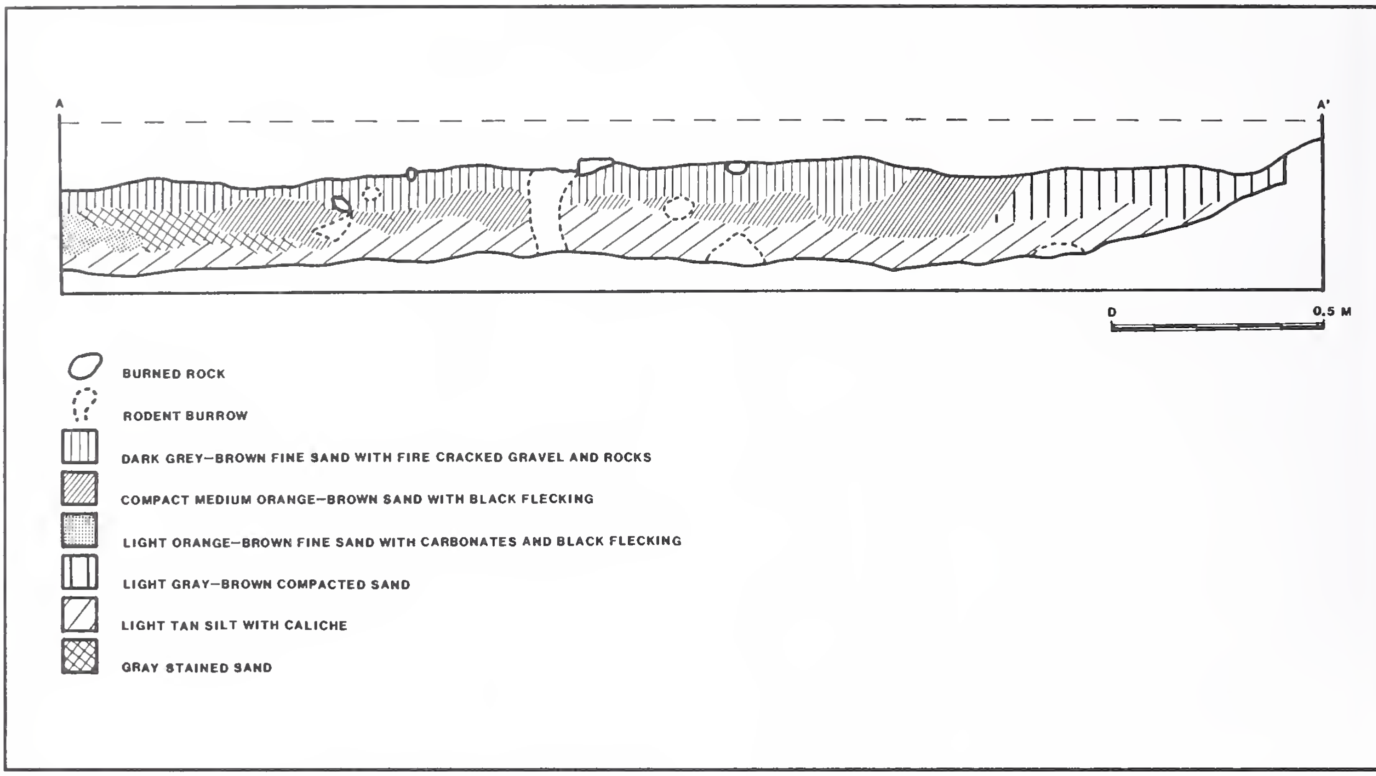


Figure 6-2. Site FA 3-6, Feature 4, east-west cross section.

rocks were present in the immediate area, but no burned soil was found within the feature. Charcoal flecks were, however, present within the dark-stained matrix of the feature (Fig. 6-4).

Feature 5 appears to have been an ash dump associated with hearth(s) found in Locus 1. (More than one burning episode is indicated in Locus 1 by the spread of carbon 14 dates from this area [Table 6-1])

It is also possible that Feature 5 might represent a pit or basin where stone-boiling occurred. A series of such pits are described by Elyea and Hogan (1983:74-77). They were small, basin-shaped pits filled with an ashy matrix, and with no oxidized areas. They were associated with fire-cracked quartzite cobbles. The small ash area on FA 3-6 conforms to this description, and was also associated with fire-cracked quartzite cobbles, which are present throughout the larger stain area of Locus 1.

Scattered charcoal from the stained feature fill yielded a small radiocarbon sample with a reading of 1030 + 230 (TX-4781) (Table 6-1), which gives a calibrated date of A.D. 950 ± 330. One floatation sample was removed from Feature 5; it contained uncharred juniper twigs and charred goosefoot seeds (Toll, this volume). In this sample, the juniper is probably non-cultural while the charred goosefoot is cultural. The pollen sample contained juniper, Cheno-am, Artemisia, and low-spine Compositae pollen. Scott Cummings feels that the Cheno-am pollen represents the use of Cheno-ams as food in Locus 1, which agrees well with the botanical information, while the Artemisia and Low-spine Compositae pollen are probably indicative of the natural vegetation in the area of the site. The juniper pollen may represent either cultural or non-cultural deposition, or both (Scott Cummings, this volume). No faunal remains were found within the feature fill, and the only artifacts present were two lithic flakes. Feature 5 seems to indicate that the site was used as a plant processing or preparation locus.

Locus 2, Feature 1

Feature 1 consisted of a lithic, cobble, and fire-cracked rock scatter, with two sherds that form one vessel of Mancos Corrugated (Fig. 6-5). The scatter rested on an old erosional ground surface that had been covered by eolian sand deposits. The surface undulated but was not deeper than 10 cm. below the present ground surface. There has been active erosion in the area, and artifacts were undoubtedly moved. Though some small flakes were found in the screen, the majority of items found on the old surface were fairly large - those that would be less

Figure 6-3. Site FA 3-6, Feature 4.

affected by erosional forces. No charcoal or ash remained in the area. The only evidences of burning that remained were the fire-cracked rocks and a very small, light gray stain in the north central portion of the ca. 3 m. by 3 m. irregularly-shaped area. A series of three soil samples from the level of the artifact scatter and from two levels below it showed a higher-than-background amount of organic phosphorus in the scatter level. This can be taken as a possible indicator of cultural activity in the area (Appendix 6-1). The two levels below the scatter have only the background amount of organic phosphorus. Feature 1 seems to represent a cultural locus which has been considerably altered by erosion.

It was not possible to obtain any type of radiocarbon sample from the Locus 2 area. Floatation samples from the locus were uninformative, as they contained only uncharred juniper seeds and twigs, with one sample also containing uncharred Mormon tea (Toll, this volume). These represent background debris since they are present in the immediate vicinity of the feature and are uncharred. Pollen samples (Scott Cummings, this volume) also indicate the presence of background vegetation. The sample from the small, light gray stain discussed previously, however, contained a small amount of pollen evidence for Cheno-ams and cattail in Locus 2, which Scott Cummings feels represents economic use. She states that these plants could have been prepared in a hearth represented now by only the small stained area (Scott Cummings, this volume). No faunal remains were identified from Locus 2 (Akins, this volume).

Artifacts present within the Feature 1 area included two potsherds, chipped stone, groundstone, and modified cobbles. The ceramics are Mancos Corrugated utility ware (A.D. 900-1200), which is generally consistent with other pottery on the site. The two sherds from Locus 2 match each other but do not match sherds from Locus 1.

In general, artifacts and pollen information indicate that Feature 1 was used as a plant preparation locale, although erosion has removed a considerable portion of the evidence for such a determination.

Table 6-1. Radiocarbon Dates from FA 3-6.

Sample Number	Radiocarbon Determination	Calibrated Date1	Feature Number/ Site Area
TX-4780	1410±170	A.D. 618 ± 263[2]	Feature 4, Locus 1
TX-4781	1030±230	A.D. 950 ± 330	Feature 5, Locus 1
TX-4782	1200±140	A.D. 820 ± 230	General Stain Area, Locus 1
TX-4783	960±340	A.D. 1005 ± 410	Test Pit in Cobble Concentration, Locus 1

[1]After Klein et al. (1982).

[2]Confidence interval 95 percent.

Artifacts

Ceramics

Ten sherds, representing three vessels of Mancos Corrugated, were found on FA 3-6. The majority of sherds were found in Locus 1 and were concentrated in the northwestern part of the generalized stain area in proximity to Features 4 and 5. There was scant pottery on the site. The ceramics can be interpreted either as representing an isolated Pueblo II occurrence(s) on an earlier plant preparation and processing site, or as representing a Pueblo II Anasazi use of the site for the same purposes as earlier groups used it. At the present time, taking the radiocarbon dates into consideration, the latter interpretation seems to be the more realistic one. Out of the four radiocarbon dates from the site (Table 6-1), two center in the early part of the time range of production of Mancos Corrugated (A.D. 900-1200). These are A.D. 950 + 330 (TX-4781) and A.D. 1005 ± 410 (960 ± 340 radiocarbon years [TX-4783]). The A.D. 950 date is from Feature 5, while the A.D. 1005 date is from an excavation unit set in during the testing phase in the area of the cobble concentration approximately six meters southwest of the ash stain area. Though these samples were small (ca. 1.5 grams), with large standard deviations, they are sufficient to indicate a probable episode of use during this later time period. The accuracy of this interpretation is heightened by the fact that there are two dates from two different areas on the site, and one of these later dates is from Feature 5, which is located near the concentration of ceramics.

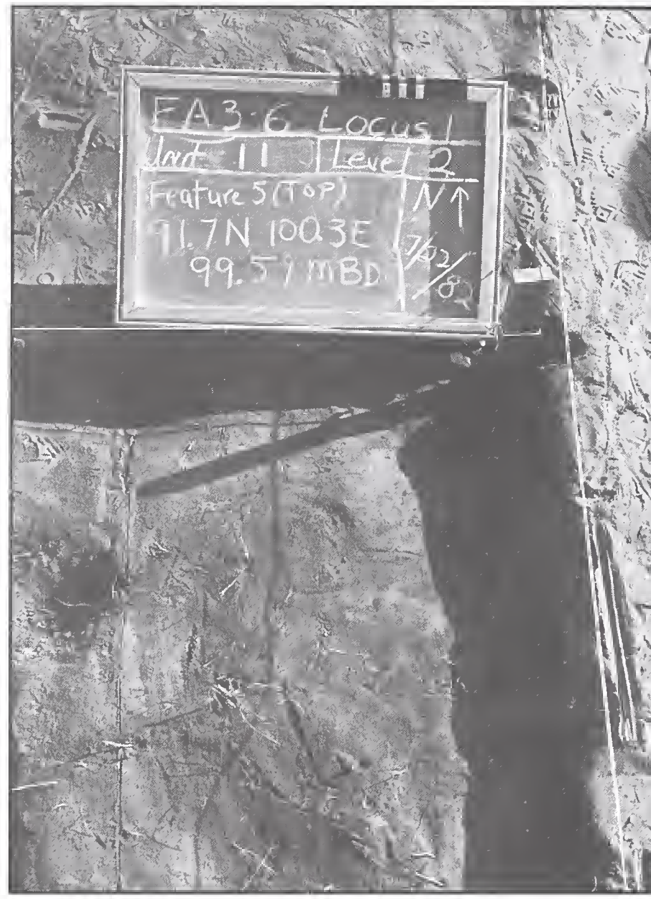


Figure 6-4. Site FA 3-6, Feature 5.

As discussed in the ceramics report (Raish, this volume), a San Juan Gray Ware, like Mancos Corrugated, fits in well with the general preponderance of San Juan wares from the sites in the Farmington project areas, and the larger pueblos of the vicinity in general. The ceramics indicate that the Puebloan group or groups which visited the site were probably from the local middle San Juan River vicinity.

Summary and Interpretation

Time Range of Occupation

Four carbon-14 dates were obtained from Locus 1 of FA 3-6 (Table 6-1). The samples were small with large standard deviations, but are adequate for use as an indicator of the occupational range of the site. Using the widest date range (at the 95 percent confidence interval), the radiocarbon dates could indicate occupations between A.D. 355 and 1415, Basketmaker II through Pueblo IV. These dates, in combination with the amount and diversity of material recovered from the site, indicate multiple occupations. The midpoints of the radiocarbon determinations, and the few ceramics from FA 3-6, however, indicate major uses of the site occurred during Basketmaker III times through early Pueblo II.

Site Function

Plant processing and preparation, as well as cooking in general, are implied by the hearth/ash dumps and groundstone from the site, as well as the floral, pollen, and faunal remains. Floatation and macrobotanical samples show utilization of economic weed species such as goosefoot (most common), and seepweed and stickleaf (less common). Unburned pinyon nutshell was found in one sample (out of 23 from the site). Cultural affiliation of the specimen is uncertain since it was not charred. No pinyon is present in the immediate vicinity of the site today. A carbonized corn cupule, recovered from the diffuse stain area, is the only record of agricultural crops at the site (Toll, this volume). The pollen information (Scott Cummings, this volume) concerning the edible, wild plant species present accords well with the botani-

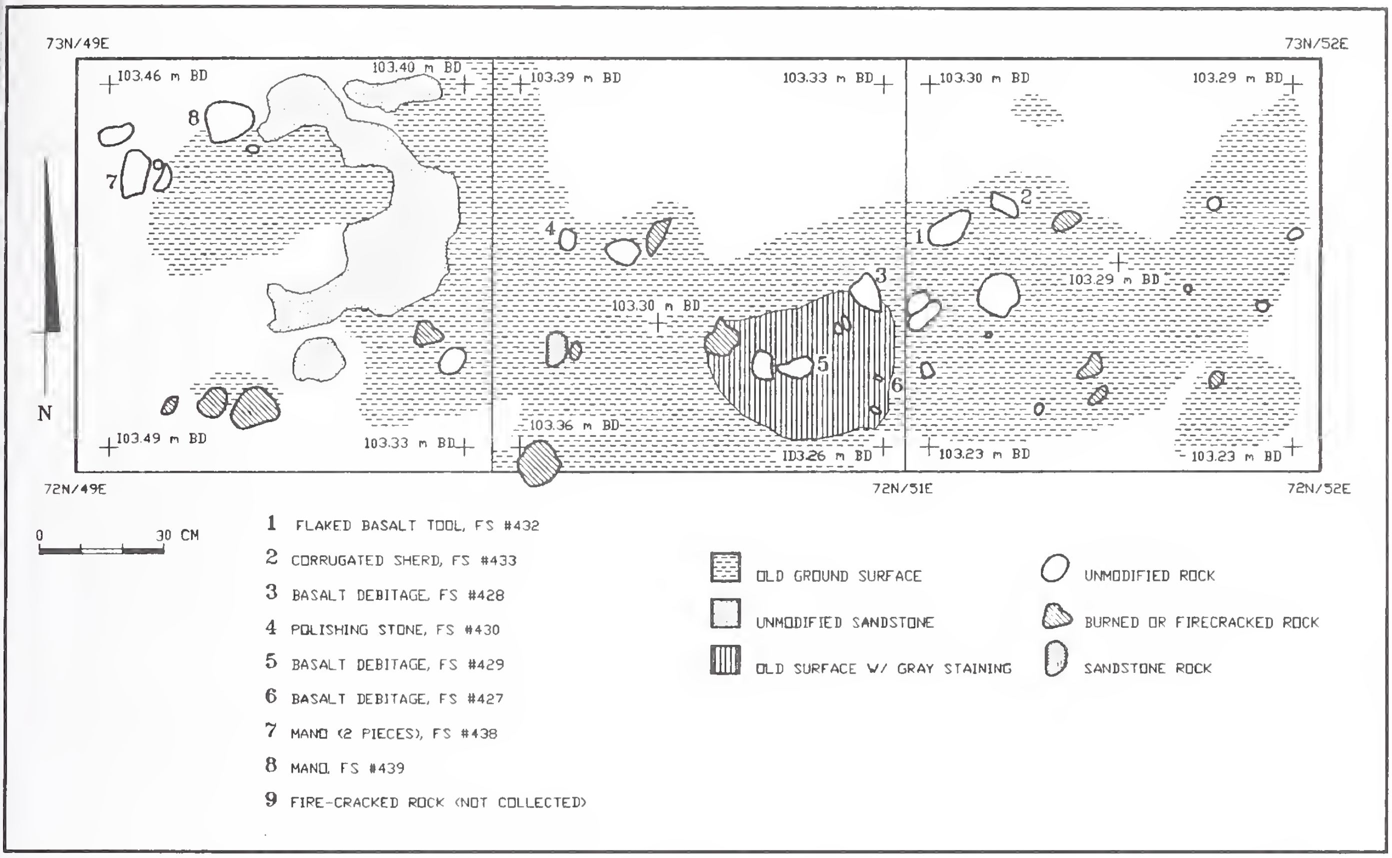


Figure 6-5. Site FA 3-6, Feature 1.

cal evidence. There is no pollen evidence for the use of cultigens, however. The evidence for plant utilization at the site is heavily weighted toward wild plants as opposed to cultivated ones. Corn could have been grown in the sandy wash areas near the site, but the slight evidence for its presence indicates it probably was not grown on the site nor heavily relied upon (discussed in Scott Cummings, this volume, in reference to several of the Farmington sites). The botanical and pollen samples indicate a site that was primarily oriented to the use of wild plant foods with major occupations in the late summer to fall. As discussed by Toll, stickleaf is a late spring crop, while all the other wild food products are obtainable in late summer to fall (Toll, this volume).

Faunal remains from FA 3-6 are small, burned fragments that seem to show the presence of both cottontail and jack rabbits, as well as at least one medium to large mammal, possibly an artiodactyl (Akins, this volume). The condition of the bones indicates that meat was being cooked on the site.

During its several periods of occupation, FA 3-6 was a seasonally-used campsite with the major function of preparing and processing wild plant foods, in addition to the procurement and consumption of meat. Though there is evidence for the presence of corn on FA 3-6, the main purpose of the site is not considered to be agricultural as would be the case with a fieldhouse or field-monitoring situation. The preponderance of wild plant remains over cultivated ones suggests this interpretation.1 This conclusion fits with the known importance of wild food resources to groups in northwestern New Mexico from Archaic through Anasazi times (Toll 1983 and this volume).

The major occupation of FA 3-6 was during Basketmaker III times. Research has shown that Basketmaker III sites in the region can occur in a wide variety of locations, one of which is an upland, mesa location (Cordell 1984; Hayes 1981; Judge 1982). Information from the Chaco Canyon survey, for example, noted the ubiquity of sites of this time period, and also noted the importance of upland, mesa locations. Of 148 Basketmaker III sites in Chaco, 41 percent were situated on elevated mesa locations. These included habitation as well as special-use sites, with no discernible difference in environmental zone associations between habitation and nonhabitation sites (Hayes 1981). The Basketmaker III occupation of FA 3-6 accords well with the occurrence of upland, Basketmaker special-use sites throughout the region.

The later, early Pueblo II use of the site also seems to represent a special-use function as a wild resource procurement locus for groups from larger habitation sites in the major drainages of the area. Thus, FA 3-6 appears to have been a special-use campsite for local groups over a long period, centering on Basketmaker III through early Pueblo II.

FA 1-6 (LA 33724)

Setting

Site FA 1-6 consisted of a slab-lined pitstructure with an associated storage area, small trash deposits, and a surface lithic and ceramic scatter (Fig. 6-6). The site is located on the well-drained, southeast slope of Hood Mesa approximately 4 km. northwest of the Animas River, 4 km. east of the La Plata River, and 2.4 km. east of Farmington Glade Arroyo. Porter Arroyo, which drains into the Animas, runs .25 km. to the east of the site. The site is cut by several small washes which drain into Porter Arroyo. There are outcrops of bedrock sandstone in several places, and a series of shale-clay deposits within the sandstone along the eastern margin of the site.

Vegetation in the vicinity of the site consists of pinyon, juniper (both Juniperus osteosperma and Juniperus monosperma as discussed by Toll [this volume]), Mormon tea, bitterbrush, sage, and various grasses and forbs.

Testing and Excavation Methods

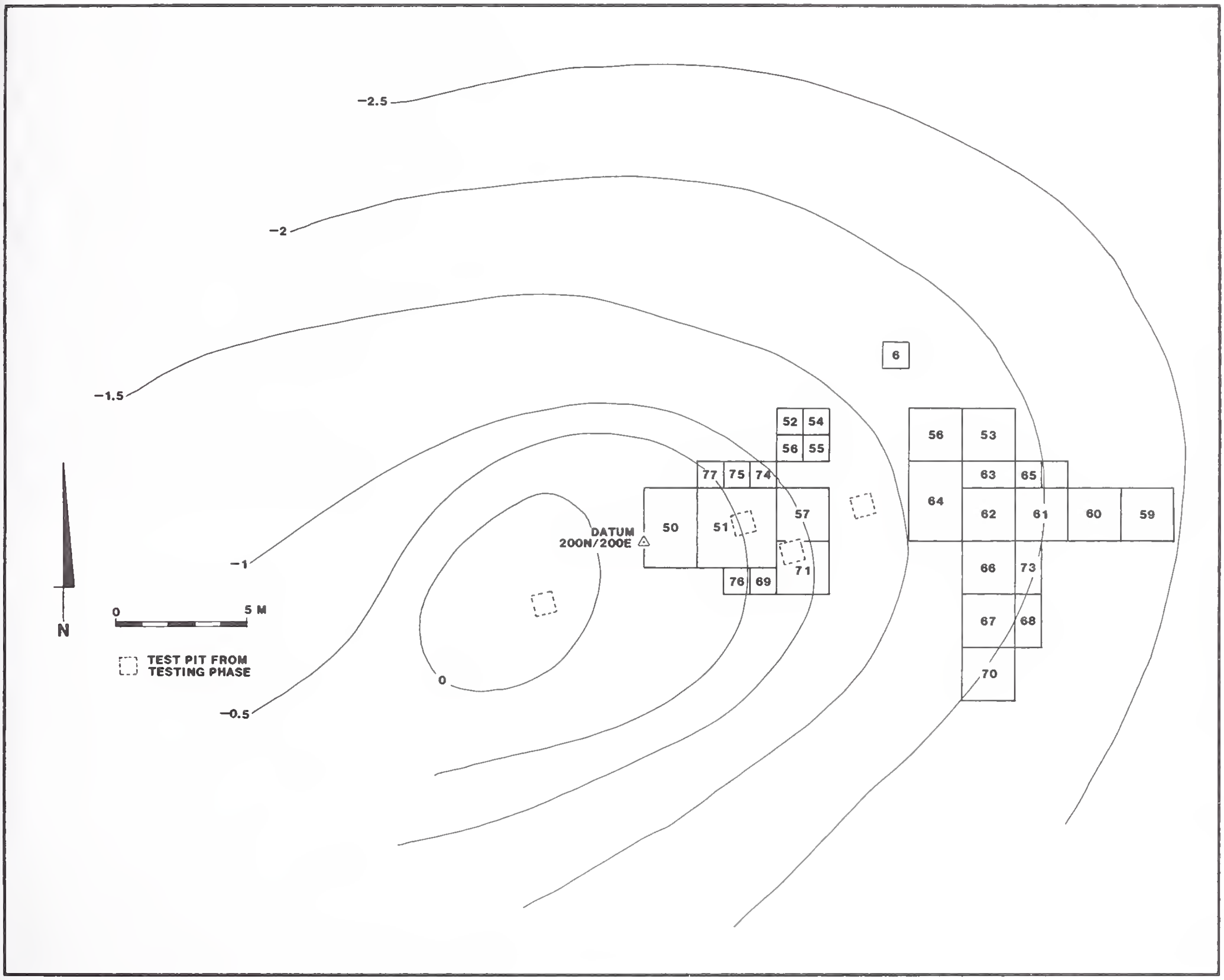
Site FA 1-6 was reported from survey as a lithic and ceramic scatter with two rows of upright slabs possibly representing a storage cist or cists. During the testing phase, three separate loci were examined as a part of site FA 1-6 (Map 6-3). The main site area (Locus 1), just described, was the one identified during survey. It was tested in the following way. Locus 1 was mapped, photographed, and surface-collected using 1 m. by 1 m. grids and provenience plots. Four 1 m. by 1 m. test pits were placed to examine the areas of artifact concentration and the possible storage facility. Completion of these test pits indicated the presence of a possible storage structure in Locus 1. On the basis of this information, the site was scheduled for more complete excavation.

Two other areas, referred to as Locus 2 and Locus 3, were also examined and a few items were surface-collected from these areas using provenience plots. Locus 2 consisted of a small cobble and sandstone concentration located 65 m. northwest of Locus 1. From surface appearance the feature seemed to be a possible hearth, so it was scheduled for excavation. Excavation revealed a modern dog burial (a cairn terrier perhaps?) complete with collar and rabies identification tag. The dog was reburied and excavation in Locus 2 was discontinued and will not be discussed further.

Locus 3, located 80 m. north of the main site area, was identified during testing as a possible structure on the basis of what appeared to be the tops of sandstone slabs just visible on the surface. This locus was also scheduled for excavation, which showed that the sandstone visible through the surface sand was part of the bedrock that outcrops throughout the site vicinity. This locus also needs no further discussion.

Excavations on site FA 1-6, then, were concentrated in Locus 1 with the goal of defining the possible structure, as well as any activity areas that might be associated with it. Tests were also conducted to determine if any other structures might be present within the site area. Before excavations began, the Locus 1 area was surface-collected, again in 2.5 m. by 2.5 m. grid units. Since the majority of surface artifacts were found eroding downslope from a small knoll on which the possible

Figure 6-6. Site FA 1-6



Map 6-3. Site FA 1-6.

structure was located, this unit size was considered appropriate.

A 3 m. by 3 m. unit was laid over the area of the possible storage structure in order to surface-strip it to define the full extent of the feature. During this operation, it was discovered that a possible pitstructure extended southeast from the storage area. Consequently, another large, surface-stripping unit (2 m. by 2 m.) was placed immediately southeast of the first unit. On definition of a pitstructure outlined by upright sandstone slabs with an attached storage bin, the larger units were broken down into 1 m. by 1 m. or 1 m. by 2 m. units for excavation of the structures. These units roughly quartered the pitstructure. The small storage area was excavated in an east and west half. Other 1 m. by 1 m. units were set in as needed to uncover areas surrounding the structure and storage bin in an effort to identify extramural areas or features. Two small trash dumps in the vicinity of the structure were excavated in 1 m. by 1 m. units. Several other 1 m. by 1 m. units were also set in to examine surface stains and artifact concentrations in various locations of Locus 1. A large area (50) to the east of the structure was surface-stripped in 2 m. by 2 m. units in a search for other features. These units were taken down 10-20 cm. to bedrock where several naturally occurring pockets of clay/clay shale were found. No other features were noted during this stripping operation.

Site Elements

Pitstructure (Feature 3)

The pitstructure on site FA 1-6 was located on top of a small knoll and had a small storage structure attached (Figs. 6-7 and 6-8). The pitstructure itself was roughly circular and measured 2 m. N-S by 2.3 m. E-W. Radiocarbon dates from the pitstructure and storage areas indicate several occupations centering in Basketmaker III times (Table 6-2). The structure was outlined by upright sandstone slabs and was built against the edge of a sandstone outcrop on its western side. It was approximately 35-40 cm. deep, measuring from the modern ground surface down to the bedrock floor.

Figure 6-7. Site FA 1-6, Pitstructure.

The pitstructure fill consisted of tan to light brown sandy soil with a moderate amount of sandstone rubble. Both root and rodent disturbances were present in the fill. Artifacts included lithics and a few scattered ceramics. The ceramics are Mancos Corrugated and Mesa Verde Corrugated, and relate to later occupations of the site for which there is evidence in both ceramics and radiocarbon dates (Table 6-2). Both floatation and pollen samples from the fill reflect the natural vegetation in the site's vicinity (Scott Cummings, this volume and Toll, this volume). The presence of Zea pollen in the fill indicates that corn was utilized during the later occupations of the site. There were no prehistoric faunal remains. One radiocarbon sample from the structure fill yielded a reading of 1950 + 220 (A.D. 15 ± 410) (TX-4772). This date is considerably earlier than any of the other date groups from the site, and should be regarded as spurious.

The floor of the structure was formed by bedrock, which was apparently made level by a covering of gray clay. This clay was especially prevalent in the eastern portion of the structure where the bedrock dips down. Mortar was present between some of the sandstone slabs; washing of this mortar may also have been responsible for some of the clay covering found on the bedrock floor.

Six samples of clay/possible mortar and two samples from naturally-occurring clay deposits on site FA 1-6 were sent to the University of Arizona for x-ray diffraction analysis. Four samples of possible mortar located within or immediately outside the structure gave identical readings and are considered to be from the same source. One sample from outside the structure in a trash

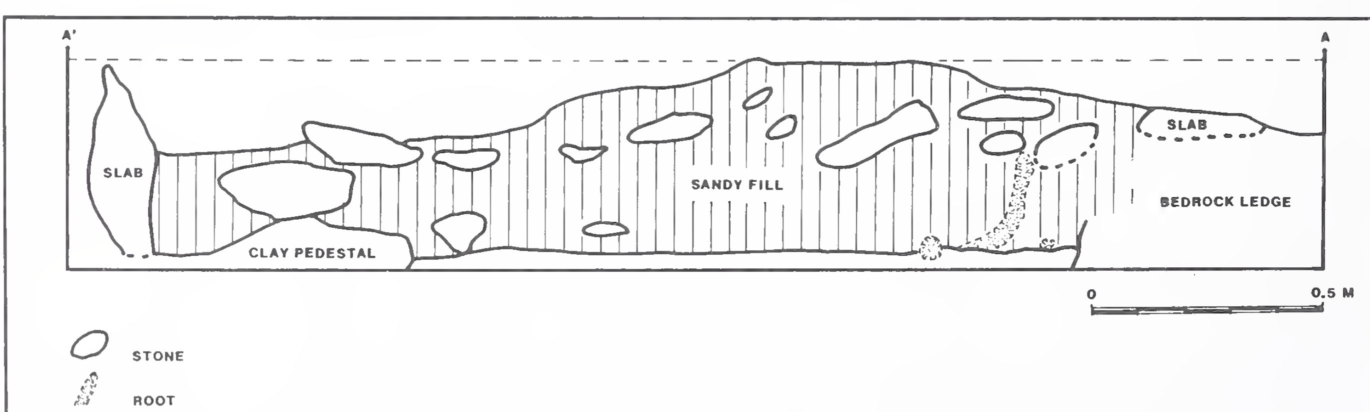


Figure 6-8. Site FA 1-6, pitstructure cross-section (see Map 6-4).

Table 6-2. Radiocarbon Dates From FA 1-6, Locus 1.

Sample Number	Radiocarbon Determination	Calibrated Date[1]	Feature Number/ Site Area
TX-4771	1410+60	A.D. 608±48[2]	Feature 3, Structure Fill (immediately above bedrock)
TX-4772	1950±220	A.D. 15±410	Feature 3, Structure Fill
TX-4773	1520±120	A.D. 440±190	Feature 5, Hearth within Structure
TX-4774	1390±350	A.D. 618±558	Feature 4, Storage Bin
TX-4775	1120±70	A.D. 903±128	Feature 6, Midden
TX-4776	1250±70	A.D. 755±135	Feature 6, Midden
TX-4777	600±240	A.D. 1350±290[3]	Feature 7, Ash Pit/Hearth
TX-4778	1310±180	A.D. 720±320	Feature 8, Hearth within Structure

[1]After Klein et al. (1982).

[2]Confidence interval 95 percent.

[3]This reading is also consistent with calibrations of A.D. 1083±23 and 1388±253.

deposit (Feature 6), and one sample from clay nodules on the floor of the structure near hearth Feature 8 are similar in composition to the other samples but not identical. The two samples from the clay deposits are unlike the other samples and indicate that the clay in use in the structure and its vicinity did not come from the tested deposits on the site (Appendix 6-1). These clay deposits are discussed in greater detail under Feature 2.

Two features are present on the floor. These will be discussed separately below. No artifacts were found in floor context. A pollen sample from immediately above the floor displays aggregates of Juniperus and Pinus pollen as well an Cheno-ams, Cleome, and Zea. Scott Cummings believes that the presence of aggregates of these pollen types within the structure most probably indicates the use or presence of these plants within the structure (Scott Cummings, this volume). A radiocarbon sample from the same area gave a reading of 1410 + 60 B.P. (A.D. 608 ± 48) (TX-4771). This date fits well with the period of use indicated by other dates from the structure.

The manner in which the roof and walls of the pitstructure were built is unknown. No postholes or roof fall/wall fall, which would indicate a jacal superstructure, were encountered. Sandstone rubble was found on the surface and in the fill of the structure. Some of the small, broken fragments come from the decomposing sandstone bedrock against which the structure is built. Other pieces, however, represent fallen upright slabs and could also have been incorporated into masonry walls, as discussed in Green and DeBloois (1978:74-75) and Sebastian (1983:111, 121). The sandstone rubble is not sufficient to have formed complete masonry walls, however. Rancier (1982) suggests that perhaps the structure was never completed, with the foundation used as a hearth area, or, more likely, that the portion above ground was of a temporary or ephemeral nature without posts sunk into the ground.

Feature 5

Feature 5 was a roughly oval hearth area located in the southeast section of the structure (Fig. 6-9). It measured

Figure 6-9. Site FA 1-6, Features 3 and 5.

35 cm. north-south by 50 cm. east-west, and consisted of 7 cm. of ash, charcoal and, fire-cracked rock fragments. The feature rested directly on the bedrock floor, which was stained black. Three small, upright, burned sandstone slabs on the edge of the stain were at first considered to be part of a hearth border. On further excavation, they were found to be leaning against an intrusive juniper root, which makes the cause of their upright position uncertain. These burned slabs, in combination with others found in the hearth, may, however, have formed part of a hearth lining or hearth border. A burned core was found just outside the hearth area; no other artifacts were found in association with the feature.

A radiocarbon sample from Feature 5 yielded a determination of 1520 + 120 (A.D. 440 $\pm$ 190) (TX-4773), which falls within the early range of dates from the site. Of the two floatation samples from the feature, one contained no macrobotanical materials, while the other contained charred corn. Charcoal from the feature was made up primarily of juniper with a small amount of cottonwood/ willow (Toll, this volume). The pollen sample from Feature 5 contained a large quantity of Cheno-am pollen as well as a large number of aggregates of this pollen. Scott Cummings considers this to indicate cooking of Cheno-ams within the structure (Scott Cummings, this volume). Juniper pollen was also present, which probably reflects the use of juniper as fuel, as in the charcoal sample. Thus, the pollen and floatation samples show the preparation of both corn and Cheno-ams in the feature. In addition, Scott Cummings (this volume) suggests that the high concentration of Cheno-am pollen within the feature indicates that Feature 5 was indeed a hearth (as opposed to an ash dump). As she states, "Pollen resulting from the spillage of food items is frequently recoverable from hearth fill, but samples that are primarily ash and have been removed from hearths have frequently been burned at a sufficiently high temperature to cause the destruction of most of the pollen types originally present in the hearth" (Scott Cummings, this volume). There were no faunal remains within the feature.

Feature 8

Feature 8 was a circular burn area, 60 cm. by 60 cm., located against the north wall of the structure (Fig. 6-10). There were four upright sandstone slabs contiguous with the burn area which were fire-reddened. Pale gray ash with charcoal flecks and small fire-cracked rock fragments filled a depression in the bedrock floor to a maximum depth of 13 cm. The bedrock was stained black beneath the feature.

This ash area was covered with the same gray clay that was found in patches on the floor of the structure. This represents either an intentional covering of the feature during a period of reuse of the structure, or washing of

Figure 6-10. Site FA 1-6, Feature 8.

Figure 6-11. Site FA 1-6, Features 3 and 4.

clay from between the upright slabs or from other floor areas over the feature after abandonment. The radiocarbon reading from a small sample from Feature 8 is 1310 + 180 (A.D. 720 ± 320) (TX-4778). This date makes Feature 8 the latest-dated use of the structure. This later date for Feature 8 makes unintentional covering of the feature seem the most likely explanation for the clay covering.

No artifacts or faunal remains were associated with the feature. Botanical samples were equally uniformative as only uncharred juniper seeds and uncharred pinyon nutshell were present (Toll, this volume). Both of these occur on the site and were probably introduced via root and rodent disturbances.

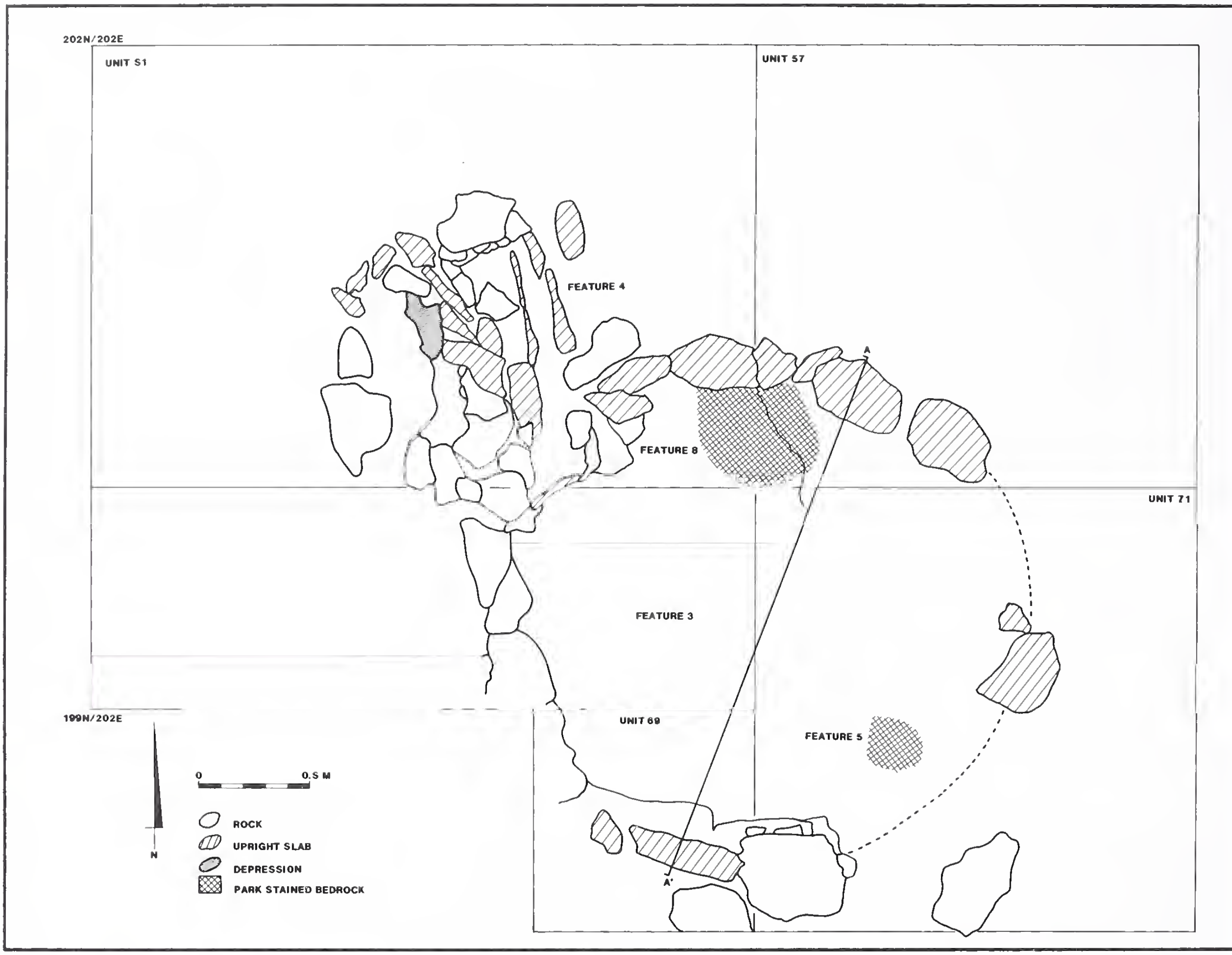
During excavation, there was some discussion whether Feature 8 represented a hearth or a burn (or partial burn) of the structure (the latter possibility raised by the oxidized, upright slabs). The fairly contained nature of the feature, in combination with the lack of general evidence on the floor, in the fill, and on the other upright slabs of a structural fire, indicates that the feature served as a hearth. The nature of the superstructure when this feature was in use, however, is unknown. Perhaps this hearth represents a period of use when no upper walls or roof were present, as mentioned previously.

Feature 4

Feature 4 was a small, upright, sandstone slab storage structure attached to the northwestern edge of the main structure and constructed in the same way (Fig. 6-11; Map 6-4). It was roughly 1.4 m. north-south and 1.6 m. east-west, and was divided down the center from north to south by sandstone slabs. Mortar was used to join the slabs, as in the main structure. This small structure was 70 cm. at its deepest point. The fill consisted of loose sand with a few flakes and groundstone fragments. Two unidentified utility ware sherds were located on the surface of Feature 4 and are undoubtedly related to later occupations of the site. Loose sandstone within the fill and in adjacent areas may have been used as a covering for Feature 4, although no evidence of an in situ covering was found. A large slab metate was found along the eastern edge of the feature and led to its initial interpretation of Feature 4 as a mealing bin (Fig. 6-12). This feature also resembles a small, masonry storage cist, and may have functioned in both capacities. Feature 4 is referred to here as a storage structure simply for ease of discussion.

A small radiocarbon sample (1 gram), collected from charcoal flecks from 5 cm. depth to bedrock in the eastern half of the structure, yielded a reading of 1390 + 350 (A.D. 618 ± 558) (TX-4774). Though the sample is small and the standard deviation is very large, this date fits well with the date from the pitstructure (Table 6-2) and is not inconsistent with the time range of occupation shown by the several dates from the pitstructure and its two hearth features.

Floatation and macrobotanical samples from the storage bin do not indicate the function of this small structure. Primarily uncharred juniper seeds, twigs, and hidden flowers were present, representing contamination by vegetation in the vicinity of the site. A small amount of charred juniper twigs was also present. Though cultural, these are not particularly informative (Toll, this volume). Pollen samples show contamination from local arboreal pollen, but also show heavy concentrations of Cheno-ams in lower levels of the fill. Scott Cummings feels these concentrations represent either Cheno-ams growing in the disturbed fill or the disposal of cultural trash in the fill by later occupants (Scott Cummings, this volume). A sample from 3-4 cm. below ground surface immediately above the metate, along the eastern edge of the bin, also contained Cheno-am and *Juniperus* pollen. Scott Cummings attributes these occurrences to the presence of these pollen types in the general fill (Scott Cummings, this volume). A small amount of *Zea* pollen was noted in this sample. This is also attributed to the presence of this pollen type in the



Map 6-4. Site FA 1-6, Pitstructure.

general fill, resulting from its discard by later site occupants (Scott Cummings, this volume).

Faunal remains in the fill of Feature 4 included a slightly scorched vertebra and a humerus from a prairie dog or rock squirrel, and a maxillary incisor from a pocket gopher. Akins (this volume) suggests that the prairie dog/rock squirrel represents prehistoric use, while the pocket gopher may be either prehistoric or modern. These remains represent trash dumping into Feature 4.

Feature 4 abuts Feature 3, and radiocarbon dates indicate that it was in use during at least one of the occupations of the main structure (Table 6-2). This structure had at least three occupations, primarily centered during Basketmaker III times. Plant remains indicate that the majority of occupations of the site were in late summer to early fall. Charred ricegrass remains from one trash feature outside the pitstructure indicate at least one late spring occupation. Remains from within the pitstructure indicate late summer to early fall occupations.

Features 6 and 9

Features 6 and 9 were small trash dumps located 30 cm. north of the storage structure (Feature 4). They were both areas of diffuse charcoal-stained sand with scattered charcoal flecks. Oxidized and non-oxidized sandstone fragments, cobbles, and artifacts were present within the features. Feature 6 measured 1.10 m. north-south by 1.20 m. east-west, and was 17 cm. in depth.

Feature 9 measured roughly 1 m. in diameter and was approximately 10 cm. deep. Feature 6 was located underneath the southwestern portion of Feature 9. These features are classed as trash dump or hearth dump areas, as opposed to hearths, since they both showed stained sand intermixed with non-stained sand, and lacked ash and a base of oxidized earth or rock. They were also somewhat amorphous, and the staining in Feature 9, especially, was very light, with only scant charcoal flecking.

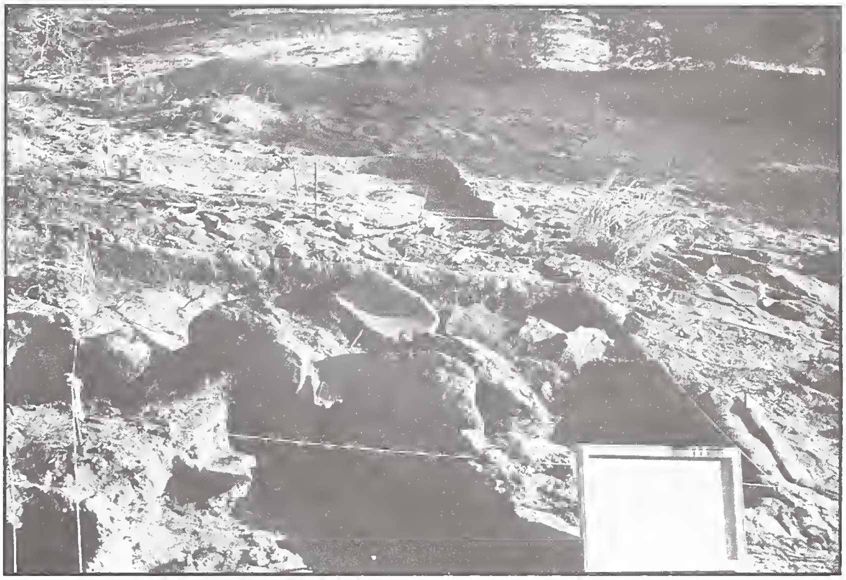


Figure 6-12. Site FA 1-6, Feature 4, slab metate.

Radiocarbon dates were obtained from the Feature 6 trash deposit, but there was not sufficient charcoal in Feature 9 to obtain a sample. The radiocarbon determinations were 1120 ± 70 (A.D. 903 ± 128) (TX-4775) and 1250 ± 70 (A.D. 755 ± 135) (TX-4776). Sample TX-4776 came from the lower level of the small trash dump while the later date came from the upper level. These dates most probably indicate two episodes of use.

During excavation, it was felt that Features 6 and 9 were contemporaneous with the structure, and represented trash dumping by structure occupants. Alternatively, it was suggested that the trash deposits might be earlier, and that the structure was dug into them. The radiocarbon dates do not readily confirm either interpretation. If the upper end of the date range from the structure samples is used (Table 6-2), then the trash deposits could be interpreted as occurring during the occupation of the structure. The main range of the dates, however, indicates that Feature 6, at least, represents later uses of the site. This seems the most likely interpretation in view of the major clustering of the structure dates in earlier times.

Artifacts from the features included both lithics and a few ceramics. No faunal remains were present. One unidentified plain grayware sherd was present in Feature 6. Feature 9, which has no radiocarbon dates, can also be suggested to show a use of the site that is later than the structure on the basis of at least one of the two sherds present in the feature. These are Mancos Corrugated (A.D. 900-1200) and Blue Shale Corrugated (A.D. 925-1150). The Blue Shale Corrugated sherd is probably intrusive to the feature, however, as it matches other sherds scattered throughout Locus 1.

One pollen sample was obtained from Feature 6, which contained aggregates of both juniper and Cheno-am pollen. Scott Cummings (this volume) attributes these pollen types to the natural vegetation on the site, but does state that they might also represent the disposal of cultural materials in the trash deposit. Floatation and macrobotanical samples contained uncharred juniper twigs (a contaminant), charred juniper seeds, charred cholla and ricegrass seeds, and charred corn (Toll, this volume). Uncharred pigweed was also present, undoubtedly as a contaminant. The majority of charcoal from Feature 6 consisted of juniper, with smaller amounts of cottonwood/willow and rabbitbrush. Feature 6, then, also indicates preparation of both domestic and wild plants on the site. No pollen or floatation samples were obtained from Feature 9.

Feature 7

Feature 7 was a partially excavated hearth located 2.5 m. north of the storage structure (Feature 4). It is estimated to be 50 cm. in diameter, and basin-shaped. It had been partially destroyed by a large juniper located in the northern portion of the feature, and for this reason only the southern section of the feature was excavated. Feature 7 consisted of charcoal-stained sand, ash, and small pieces of charcoal, extending to a maximum depth of roughly 30 cm. Underlying bedrock was fire-reddened in the western portion of the pit. Lithics and a few pieces of oxidized sandstone were present within the hearth fill, but no pottery or faunal remains were encountered.

A dispersed radiocarbon sample was obtained from the feature, which gave a reading of 600 + 240 (TX-4777). Several calibrations are possible for this reading: A.D. 1350 + 290, 1083 ± 23, or 1388 ± 253 (Klein et al. 1982), any of which would indicate another period of use on the site. There is no ceramic evidence to confirm a late 14th century occupation, so at present the A.D. 1083 calibration seems more likely.

Floatation samples from Feature 7 contained charred juniper seeds, four-winged saltbush fruits, and corn. Charcoal from the feature was identified as juniper, cottonwood/willow, and four-winged saltbush (Toll, this volume). Pollen was composed of a large quantity of Cheno-ams, and aggregates of Cheno-ams. The amount of Cheno-am pollen leads Scott Cummings to suggest that Cheno-ams were cooked within the feature (Scott Cummings, this volume). As discussed for other features, however, Cheno-ams growing in the disturbed soil of the site could be the cause of the concentration of this pollen in Feature 7. The presence of juniper and saltbush in the hearth resulted from fuel use, while the corn and Cheno-ams probably derived from food processing and preparation.

The remaining areas surrounding the structure on the small knoll were excavated in 1 m. by 1 m. or 1 m. by 2 m. units to determine if any other activity areas were present. There has been considerable erosion on the knoll, which may have removed some evidence of previous use. No other hearth or midden features were located during the excavation of units surrounding the structure.

Two metates, in addition to the one located along the edge of the storage bin, were located in the area surrounding the structure, and serve as further evidence of plant preparation and processing. One was located 30 cm. north of the storage structure and 30 cm. east of a grooved axe. The other was located 1.1 m. northeast of the pitstructure. It was not possible to obtain dates from the metates or their surrounding areas. Thus, it is unknown if they were used during the occupation of the pitstructure or later. A floatation sample from the vicinity of the metate, located 1.1 m. from the structure, contained a charred corncob fragment and charred juniper seed fragments (Toll, this volume). A pollen sample from the fill inside the metate trough contained a large quantity of Cheno-am pollen, and aggregates of Cheno-am pollen, which leads Scott Cummings (this volume) to suggest that Cheno-ams were ground on the metate.

Ceramics in the vicinity of the more distant metate consist of Mancos Corrugated utility ware. These sherds match other sherds found scattered around the top of the knoll, and cannot be shown to be directly associated with the metate. No ceramics were found in association with the other metate. The pottery from these units on the top of the knoll consists of Mancos Corrugated, Blue Shale Corrugated, and Mancos Black-on-white. The structure fill contained Mancos Corrugated and Mesa Verde Corrugated. Except for four sherds of McElmo Black-on-white, these ceramics represent the full range of types found on the site as a whole. Based on their date ranges, these pottery types undoubtedly represent several periods of use. Due to erosion, disturbance, and a history of reoccupation, it is not possible to sort out specific use areas on the basis of concentrations of specific pottery types. These are mixed throughout the various excavation units. This pattern of mixture prevails throughout the Locus 1 area and seems to be the result mainly of erosion and washing on the site.

Feature 2

Feature 2 was located downslope and 6 m. east of the pitstructure (Fig. 6-13). It consisted of seven naturally-occurring pockets of clay in the sandstone bedrock. These ranged in size from 1 m. by 1 m. to 20 cm. by 20 cm., and extended along a line running 5 m. north-south. The clay in these depressions was a silt/clay near the surface where more weathering had occurred, with shale on the bottom of the depressions and appearing as inclusions in the sandstone bedrock. Considerable preparation would be needed to make this clay ready for use. To determine if the prehistoric inhabitants had used clay from these deposits as mortar in the structure, samples from the structure and its environs and from two of the clay deposits were sent to the University of

Figure 6-13. Site FA 1-6 Feature 2.

Table 6-3. FA 1-6 Site Areas and Features with Identifiable Ceramic Types.

	Surface (General Provenience) #	%	Surface (Top Of Knoll) #	%	Surface (Bottom Of Knoll) #	%	Subsurface (Top Of Knoll) Non-Feature #	%
San Juan White								
Mancos B/W	4	100.0	2	5.9	14	25.0	7	28.0
McElmo B/W	-	-	2	5.9	1	1.8	-	-
San Juan Gray								
Mancos Corrugated	-	-	19	55.9	23	41.0	15	60.0
Mesa Verde Corrugated	-	-	9	26.5	17	30.4	-	-
Chuska Gray								
Blue Shale Corrugated	-	-	2	5.9	1	1.8	3	12.0
Total	4	100.0	34	100.1	56	100.0	25	100.0

	Subsurface (Bottom of Knoll Non Feature) #	%	Pitstructure Fill (Feature 3) #	%	Trash Deposit (Feature 9) #	%	Clay Area (Feature 2) #	%	Total
San Juan White									
Mancos B/W	5	27.8	-	-	-	-	4	9.1	36
McElmo B/W	-	-	-	-	-	-	-	-	3
San Juan Gray									
Mancos Corrugated	4	22.2	2	66.7	1	50.0	25	56.8	89
Mesa Verde Corrugated	8	44.4	1	33.3	-	-	9	20.5	44
Chuska Gray									
Blue Shale	1	5.6			1	50.0	6	13.6	14
Total	18	100.0	3	100.0	2	100.0	44	100.0	186

Arizona for x-ray diffraction analysis. Results indicated that the samples associated with the structure were probably not from the tested deposits (Appendix 6-1).

Scattered lithics and pottery were found in the area of the clay deposits. Pottery types include Mancos Corrugated, Mesa Verde Corrugated, Blue Shale Corrugated, and Mancos Black-on-white. These are the same types that are present on other areas of the site, and some match sherds from the top of the knoll. They were found in the loose sand near the surface, and their distribution appears to be the result of erosion.

Artifacts

Ceramics

Of the 300 sherds from FA 1-6, 187 are identifiable types from Locus 1. Two others are from the vicinity of the dog burial, and the remainder are not identifiable as to type. The types present on the site consist of Mancos Black-on-white, McElmo Black-on-white, Mancos Corrugated, Mesa Verde Corrugated, and Blue Shale Corrugated (Table 6-3). One Kotyiti Glaze-on-red was found in uncertain provenience in a historic dump, where it appeared that a collection of prehistoric artifacts had also been dumped. This sherd may represent a later use of the site and contact with the Rio Grande area to the east. Its uncertain provenience, however, makes it impossible to say for sure.

As can be seen from Table 6-3, specific areas and times of use, based on groupings of certain ceramic types cannot be identified. Both earlier and later types occurred together in the same areas, and were scattered across the site. This is undoubtedly due to a combination of reuse and erosion. Ceramics from the site indicate a range of occupation from A.D. 900-1300, with an emphasis on the time period from A.D. 900-1150 (Table 6-3 and Warren, this volume).

Earlier occupations are indicated by one piece of an unidentified neckbanded ware (and ca. 16 plain gray body sherds that could represent the bottom portions of neckbanded vessels) and a possible body sherd from a La Plata Black-on-red vessel (Warren, this volume). The quantity and date ranges of pottery on FA 1-6 indicate several different occupations by ceramic-producing groups in addition to the earlier occupations indicated by radiocarbon dates.

The majority of pottery found on the site comes from the San Juan ceramic tradition, as is the case with all the sites examined on the project lands. This emphasis on San Juan wares is consistent with the ceramics from larger pueblos in the area, and indicates that the Puebloan occupations of the site were probably by groups from the local middle San Juan River. Fourteen sherds of Blue Shale Corrugated (representing one or two vessels) were found scattered around the site. These represent Pueblo II contact with the Chuska Mountain area, and are the only other non-local types on the site.

The 300 sherds from the site represent a minimum of 122 vessels, which consist of 61.5 percent utility jars, 17.2 percent decorated jars, and 21.3 percent bowls (Raish, this volume). The percentage of utility wares is 61.5 percent, while the percentage of decorated wares is 38.5 percent. These percentages are similar but not identical to Sebastian's normal ceramic assemblage, indicative of a habitation or residential field house (Sebastian 1983). (Sebastian's figures are presented in the section dealing with area ceramics [Raish, this volume].)

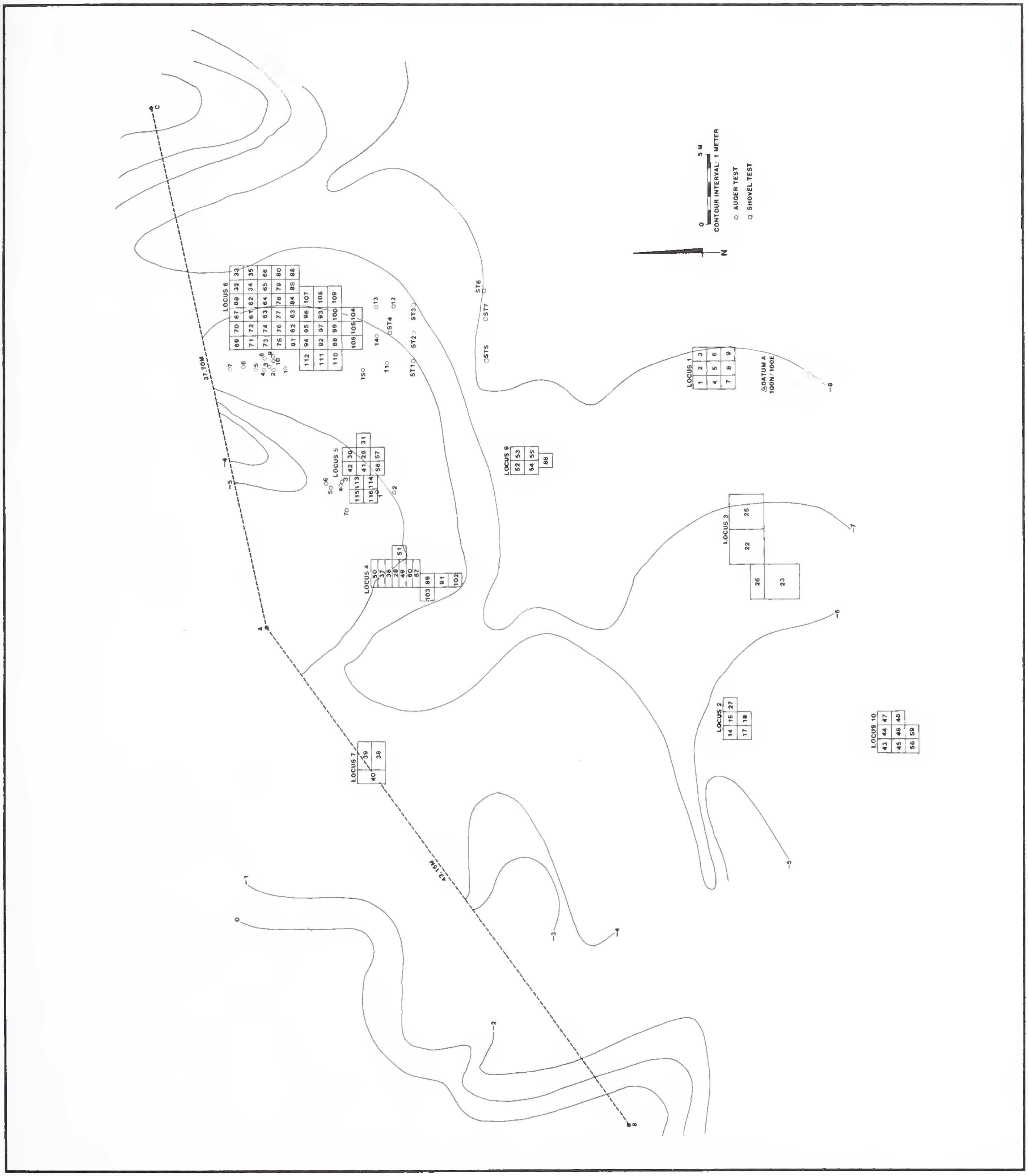
Figure 6-14. Site FA 3-3.

Summary and Interpretation

Time Range of Occupation

As discussed previously for the features located on site FA 1-6, radiocarbon dates show a maximum likely range of occupation from A.D. 440-1083, or Basketmaker III through Pueblo III (Table 6-2). This date range excludes the suspiciously early date from sample No. 4772. Dates cluster in the Basketmaker III-Pueblo I time period, however, with one late date of perhaps A.D. 1350. Pottery from the site shows an additional range of later occupations from A.D. 900-1300 (Pueblo II-Pueblo III), with emphasis on the period from A.D. 900-1150.

Radiocarbon samples from the pitstructure and storage bin indicate primary use of the structure during Basketmaker III. Pottery types and radiocarbon dates indicate that the site was reoccupied mainly during Puebloan periods I-II. The structure area or its remains may also have been used during these later occupations of the site, but the radiocarbon dates center on the earlier periods. Based on the radiocarbon dates and range of pottery types, in combination with the quantity and diversity of artifacts, it can be said that site FA 1-6 shows evidence of multiple reoccupations over a considerable time span. This interpretation is selected over a long term, continuous occupation on the basis of several lines of evidence. One of these is the evidence for seasonal occupation shown by the pollen and botanical analyses to be reviewed shortly. The nature of the site itself is another factor that conditions this interpretation. The small size of the pitstructure and its ephemeral superstructure argue against a year-round occupation, as does the lack of dated structural evidence for the



Map 6-5. Site FA 3-3.

Puebloan use. The small, superimposed trash dumps also argue for short-term reoccupations, as opposed to long-term occupation. Though erosion has occurred on the knoll, long-term residence would have produced a considerable residential midden, some of which should still be present. Finally, the long span of dates itself, in combination with the previously discussed site characteristics, argues for multiple periods of use.

Site Function

The number of occupations present on the site indicates reuse of a favorable spot over time. The site is located in the uplands where wild plant resources were available, as well as locations favorable for the cultivation of crops. The sandy wash area of Porter Arroyo, .25 km. to the east of FA 1-6, is one such location in the immediate site vicinity that might be favorable for agriculture. Upland areas are also generally suitable for hunting, but the relative absence of prehistoric faunal remains shows that hunted game was not an important resource procured from the site (Akins, this volume).

Floral and pollen remains, as well as groundstone present on the site, demonstrate that both wild plant foods and corn were processed on FA 1-6 (Scott Cummings, this volume and Toll, this volume). Wild plants that appeared in a context of cultural use include juniper, Cheno-ams, cholla, and ricegrass. Corn and Cheno-ams were the most common plants on the site, appearing in features within the structure and in those external to it. Cholla and ricegrass both appear once in the external trash dump features.

Plant remains indicate that the site was occupied primarily in the late summer/early fall period, with at least one occupation in the late spring shown by the occurrence of ricegrass. (A second, smaller harvest of ricegrass can occur in the fall in very favorable years, but ricegrass is generally considered to be a late spring/early summer resource [discussed in Sebastian 1983:405-406].) Remains from the interior features of the pitstructure indicate that it was in use during the late summer/early fall.

During its various occupations, FA 1-6 seems to have been a fieldhouse at which wild plant foods were obtained and prepared. These were probably consumed while waiting for the crop to ripen, while some may also have been obtained for future use and transported back to the habitation. The occupations of the site fit best with descriptions of a late seasonal fieldhouse, with perhaps use as a bi-seasonal fieldhouse during some periods. These interpretations are based on the plant remains, and the somewhat ephemeral nature of shelter, found on the site. Pottery data (percentages of utility jars, decorated jars, and bowls) also seem to indicate a fieldhouse occupation (Sebastian 1983).

Various fieldhouse types are discussed by Sebastian (1983:406) based on research undertaken by Moore (1979). Late seasonal fieldhouses are used as the crop approaches maturity, and during and shortly following harvest, while bi-seasonal fieldhouses are used during the spring planting and the fall harvest. Other fieldhouse types include those showing daily use where groups return to the home pueblo each night, those showing continual use during the agricultural season, and those showing only sporadic use (Moore 1979:89).

FA 1-6, then, shows primary use as a late seasonal, or perhaps bi-seasonal, fieldhouse during its various occupations. For the Basketmaker III uses of the site this type of occupation fits in well with the documented occurrence of Basketmaker III special-use sites, including fieldhouses, in upland, mesa locations (Cordell 1984; Hayes 1981; Judge 1982). Such seasonally occupied Basketmaker III and Pueblo I fieldhouses, with slab-lined structures as at FA 1-6, are also described by Green and DeBloois (1978:71-81) for Elk Ridge mesa in southeastern Utah. The later Puebloan occupations of the site, indicated by the majority of ceramics, also appear to represent use as an upland fieldhouse by local groups resident in the major drainages of the middle San Juan River area.

FA 3-3 (LA 33750)

Setting

Site FA 3-3 consists of multiple, discrete activity areas which range in date from Basketmaker II, or En Medio phase, ca. 800 B.C.-A.D. 400 (Irwin-Williams 1973), through Puebloan times. These include a pitstructure, a possible living floor, a midden area, several hearths, and three roasting pits (Fig. 6-14). The site is located in a protected area with a sandstone outcrop approximately 5 m. high encircling its northern and northwestern sides. It is situated on the well-drained southeast slope of Hood Mesa, 4.8 km. north of the Animas River, 8 km. east of the La Plata River, and 4 kms east of Farmington Glade Arroyo. The site is cut by several small washes and slopes toward the southeast. The site has sandy soil that is being eroded, and outcrops of bedrock sandstone.

Vegetation in the vicinity of the site consists of pinyon, juniper (both Juniperus osteosperma and Juniperus monosperma as discussed by Toll [this volume]), Mormon tea, bitterbrush, rabbitbrush, snakeweed, narrow and broadleaf yucca, ricegrass, and other grasses and forbs.

Table 6-4. Radiocarbon Dates from FA 3-3.

Locus Number/ Feature Number And Description	Univ. of TX-Run 1	Univ. of TX-Run 2	Dicarb
Locus 1, Feature 1 Cobble Ring Hearth	#4948 2280±60 B.P. (367 B.C.±188)[1]		
Locus 2, Feature 2 Hearth	#4951 2190±70 B.P. (217 B.C.±183)		
Locus 4, Feature 3 Slablined Roasting Pit	#4936 1140±60 B.P. (A.D. 845±175)		
Locus 4, Feature 11 Hearth	#4939 2120±80 B.P. (180 B.C.±220)	#5088 1690±100 B.P. (A.D.317±258) (Hearth & surrounding stain)	
Locus 4, Feature 14 Post	#4935 2590±240 B.P. (805 B.C.±415)		
Locus 4, Stratum 1 Ash Stain	#4940 2400±220 B.P. (447 B.C.±408)		
Locus 5, Feature 4 Cobble Ring Hearth	#4946 1860±60 B.P. (A.D.120±120)		
Locus 6, Feature 13 Pitstructure Rooffall	#4944 1870±70 B.P. (A.D.117±123)		
Locus 6, Feature 13 Pitstructure	#4937 1820±90 B.P. (A.D. 202±213)	#5085 2020±110 B.P. (80 B.C.±295)	
Locus 6, Feature 13 Pitstructure	#4938 1800±100 B.P. (A.D. 212±213)	#5086 1060±100 B.P. (A.D.987±213)	#2999 1040±60 B.P. (A.D. 1010±130)
Locus 6, Feature 7 Cobble Filled Roasting Pit Level 1	#4941 2230±70 B.P. (285 B.C.±125)		
Locus 6, Feature 7 Cobble Filled Roasting Pit Level 2	#4942 1500±60 B.P.[2] (A.D. 515±100)		#3000 1870±60 B.P.[2] (A.D. 117±123)
Locus 6, Feature 7 Unit Adjacent to Cobble Filled Roasting Pit	#4945 2350±50 B.P. (507 B.C.±243)		
Locus 7, Feature 8 Hearth	#4952 1030±60 B.P.[2] (A.D. 1020±135)	#5087 580±60 B.P.[2] (A.D. 1350±65)	
Locus 10, Feature 9 Cobble Filled Roasting Pit	#4949 1530±80 B.P. (A.D.437±193)	#5089 870±60 B.P. (A.D.1145±110)	#3001 980±60 B.P. (A.D.1055±155)

1. All dates calibrated after Klein et al. (1982). Calibration confidence interval 95 percent.

2. Split samples.

Testing and Excavation Methods

Site FA 3-3 was reported from survey as a lithic and ceramic scatter with cobble-ring hearths, and a rock alignment representing a possible rectangular room. Testing consisted of mapping and photographing the site and making a complete surface collection. Items were provenience-plotted using compass and tape. It was decided to schedule the site for excavation on the basis of the surface examination, so no test pits were put in.

The excavation phase on site FA 3-3 consisted of complete excavation of all identified features, as well as testing for buried features showing no surface manifestations (Map 6-5). A few items remaining on the surface were also collected using provenience plots. Since the site showed a number of separate use areas, each area was given a locus designation. Features within the loci were given feature numbers. Loci were generally excavated in 1 m. by 1 m. units in order to define features thoroughly, and to test for possible activity areas surrounding them. Exceptions to this excavation strategy are discussed under the sections covering each locus.

A brief discussion of radiocarbon dates is necessary before proceeding to the descriptions of excavations in the various loci. Certain radiocarbon dates from the site, especially from the pitstructure, seemed early in comparison to other lines of evidence (as discussed further below). These samples had all been processed by the University of Texas. Fortunately, we had saved portions of several large carbon samples, and had other samples from the immediate vicinity. The University of Texas graciously processed these to check the first results. Other sections of the original samples, and new samples from the immediate vicinity, were sent to Discarb Radioisotope Co. The results of these dating tests are discussed in the sections covering individual features (Table 6-4).

Due to the discrete nature of features on the site, artifacts such as ceramics, lithics, and groundstone are discussed for each individual locus rather summarized across the entire site.

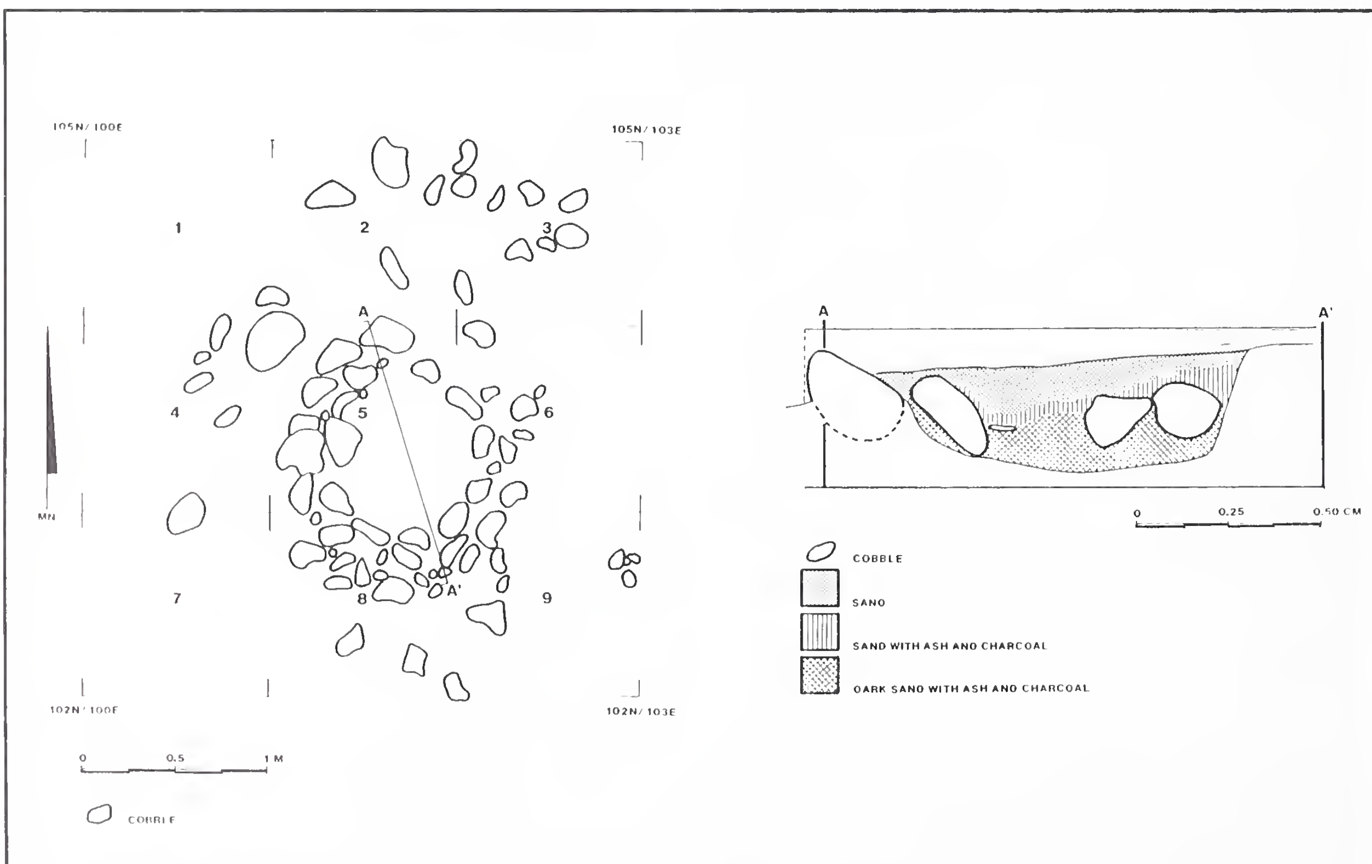


Figure 6-15. Site FA 3-3, Locus 1, Feature 1.

Site Elements

Locus 1, Feature 1

Locus 1 was located in the southeastern portion of the site (Map 6-5) and consisted of a cobble ring hearth (Fig. 6-15). The hearth (Feature 1) was excavated in west and east halves. The west half was taken as a full profile cut, while the east half was excavated in two levels. Cobbles in the hearth fill obscured the profile to the extent that quarter cuts were not useful. Artifacts and samples came from Level 2, with one sherd found on the surface of an adjacent unit. The area surrounding the hearth was excavated in 1 m. by 1 m. units in 10-20 cm. levels to locate any activity areas that might be associated with use of the hearth. None was present in the nine units that were examined.

Feature 1 was a ring of fire-reddened quartzite cobbles 1 m. north-south by 75 cm. east-west. It was 30 cm. deep at its deepest point and was filled with dark black charcoal and ash, and scattered fire-reddened cobbles (Level 2). This level was covered with a gray layer of mixed sand and ash (Level 1).

The only artifacts present in the feature, and in all of Locus 1 for that matter, were two possible lithics found in the hearth fill, and one sherd from the surface. One of the lithics is a possible flake, and the other is a small fragment of flat sandstone that may have been worked around the edge. The sherd was located on the disturbed surface and washed down from upslope features. It is a Mancos Corrugated utility ware and was probably not associated with Feature 1. No faunal remains are present in the feature.

Botanical and pollen data are not very informative. The two pollen samples from Feature 1 both contained insufficient pollen for analysis. The floatation samples indicated that juniper (most common) and pinyon were used as fuel. Uncharred juniper twigs and pinyon needles were the only botanical materials identified from the samples (Donaldson, this volume and Scott Cummings, this volume). Both of these are present on the site today and probably represent modern contaminants. A radiocarbon sample from the hearth yielded a reading of 2280 + 60 (367 B.C.± 188) (TX-4948). As discussed previously, some of the radiocarbon readings from the site were considered to be too early. Since it was not possible to date other samples from this feature, and no diagnostic artifacts were present in good context, it is impossible to assess the accuracy of this date. Differences in dates among the two University of Texas runs and the Dicarb run vary considerably from sample pair to sample pair (Table 6-4). Thus, it is not possible to suggest by how many years the original date may be too early.

Figure 6-16. Site FA 3-3, Locus 2, Feature 2.

Locus 2, Feature 2

Locus 2 was situated in the southwestern portion of the site (Map 6-5). Feature 2 was a hearth on bedrock sandstone visible on the surface as a gray stained area. It was neither cobble-lined nor cobble-filled (Fig. 6-16). The northeast quarter of the hearth was excavated as a full cut to define levels within it. The remainder of the feature was excavated in quarters, also using the levels defined in the initial cut. After removal of the southwest quarter, north-south and east-west profiles were drawn. Excavation of alternate quarters allows both a north-south and east-west profile to be drawn. Excavation in quarters and levels allows a hearth to be examined for episodes of reuse, which is not possible if all hearth fill is removed as one unit. Hearths from FA 3-3 were excavated in this manner whenever possible. Feature 2 did not, however, show evidence of reuse.

The area surrounding Feature 2 was excavated in 1 m. by 1 m. units. The loose, sandy surface was stripped from five units to a depth of ca .5 cm. to determine whether activity areas existed near the hearth. One unit was excavated 15 cm. down to decomposing sandstone bedrock. No activity areas were found. The only artifact found in these units was a shotgun shell.

Feature 2 measured 40 cm. north-south by 43 cm. east-west. It was approximately 15 cm. deep, and was roughly basin-shaped. The hearth fill consisted of charcoal, ash, and a surface layer of charcoal-stained sand. The basal

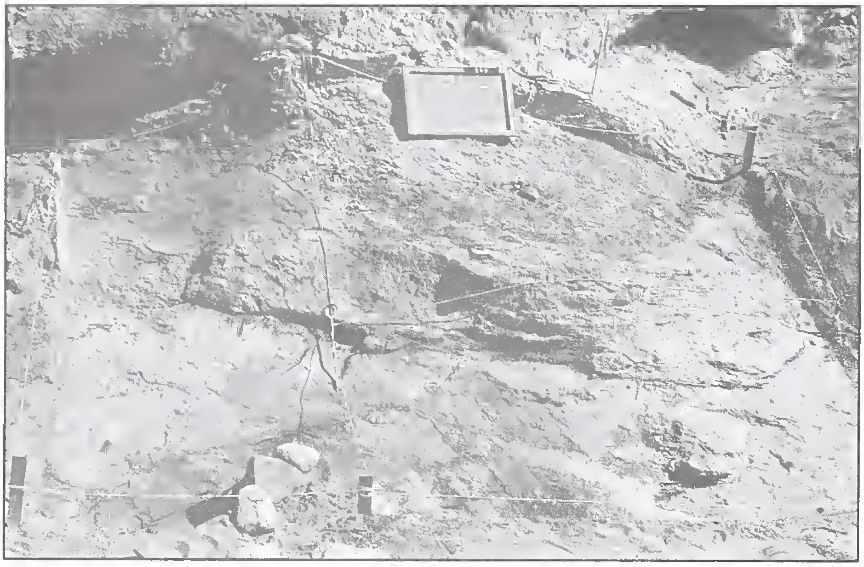


Figure 6-17. Site FA 3-3, Locus 7, Feature 8.

portion consisted of oxidized sandstone bedrock. Samples were taken from the hearth fill but no artifacts were found within it.

A radiocarbon determination of 2190 + 70 B.P. (217 B.C. ± 183) (TX-4951) was obtained from a dispersed sample from the northeast quarter of the feature. The same considerations regarding radiocarbon dates discussed under Feature 1 also apply to Feature 2. With no time-sensitive artifacts associated with the feature, it is impossible to assess the validity of the reading.

Floral and pollen samples from the ash level of the hearth show that juniper was used as fuel in this feature. Botanical remains consist of charred juniper seeds, which may be related to the use of juniper as fuel, and uncharred juniper twigs and goosefoot. These latter probably represent modern contaminants (Donaldson, this volume and Scott Cummings, this volume). No faunal remains were present within the Feature 2 area. None of the recovered material indicates the function of this hearth or the role that it played in the use of site FA 3-3.

Locus 3

Locus 3 was situated in the southern section of the site (Map 6-5). It consists of three 2.5 m. by 2.5 m. units and one 2.5 m. by 1 m. unit placed over a cobble alignment identified during testing as a possible structure. These units were excavated down to sandstone bedrock at depths of 15 to 30 cm. Upon excavation, the units were found to contain a natural collection of quartzite cobbles that seems to be the result of fluvial action, as a small stream or wash channel runs through the area. The cobbles may represent an old stream bed. No wall or foundation alignments were found. The tops of some of the cobbles showing through the surface sand created the appearance of a wall alignment.

No samples were processed from this area. Lithics, groundstone, and ceramics were present in the loose, surface sand of Locus 3. The ceramics consisted of three sherds of Mancos Corrugated and Mancos Gray Neckbanded. Most likely these washed downslope from use-areas upslope. These sherds match vessels in upslope Loci 4 and 6. Excavation in this locus was discontinued after determining that no cultural features were present.

Locus 7, Feature 8

This feature was located in the extreme northwestern portion of the site, and consisted of a hearth on a sandstone ledge projecting from the outcrop that forms the northern and northwestern site boundary. The hearth and its surrounding area were excavated in three 1 m. by 2 m. units (Fig. 6-17). Due to the shallowness of Feature 8 and its eroded nature, it was not excavated in quarter sections but was removed as one unit.

The feature measured roughly 1.44 m. north-south by 2 m. east-west at its most dispersed extent. It had been eroded and scattered over this area. Since it was sitting directly on the sandstone ledge it is only a few centimeters deep (ca. 1-6 cm). Surface and subsurface chunks of charcoal in dark black ash were present in the hearth scatter, and burned sandstone bedrock was found in the eastern portion. A few pieces of partially burned wood were also located within the hearth scatter. Several other pieces were present in a small wash running immediately below the sandstone ledge. This ledge slopes down 50 cm. to 1 m. to the wash, and these materials have washed down from the upslope hearth. The partially burned wood led excavators to conclude that the hearth was probably of recent origin. Shotgun shells in the vicinity also contributed to this conclusion.

Radiocarbon dates from Feature 8 do not support this interpretation and are somewhat confusing. The first sample from the hearth yielded a determination of 1030 + 60 (A.D. 1020 ± 135) (TX-4952). This date seemed questionably old, so a retained portion of the same sample was sent to the University of Texas (TX-5087). This latter sample is used as the radiocarbon date from Feature 8; the first is considered to be too early. The second date also seems early, however, considering the unprotected location of the hearth. The unburned wood within the hearth might, of course, represent a more recent reuse of an older feature. Unfortunately, the hearth was too eroded and scattered to determine multiple episodes of use. Other factors that might be responsible for an early date include the possibility that old wood was used or that the wood sample did not include the outer rings. This latter can adversely affect radiocarbon as well as dendrochronological samples. In recent hearths, use of petroleum fuels like gasoline to start a fire can also cause contamination. This type of contamination would produce very early dates. The sample, however, is not from the surface, but due to the shallowness of the feature it is fairly close to the surface. It seems likely that modern contamination would make the date later rather than earlier. For present purposes, and bearing in mind the above discussion, the radiocarbon determination of 580 + 60 (A.D. 1350 $\pm$ 65) is accepted for Feature 8.

There were no ceramics and no faunal remains present within the hearth. Botanical remains consisted of charred juniper twigs and uncharred compositae, viewed by Donaldson (this volume) as a probable contaminant. The dating difficulties and the general lack of functional information make it very difficult to interpret Feature 8.

Locus 9, Feature 10

This locus was situated in the center of the site immediately north of a small wash that cuts through FA 3-3 (Map 6-5). Feature 10 was a deflated hearth that measures 84 cm. north-south by 88 cm. east-west. Fire-reddened quartzite cobbles within the feature and eroding downslope from it suggest that Feature 10 was originally a cobble-ring hearth like several others on the site (Fig. 6-18). Feature fill consisted of slightly mottled, charcoal-stained sand, ash, and very small charcoal flecks to a depth of 12 cm. A small, shallow ash pit was located approximately 30 cm. south of the main hearth area and is probably associated with use of the hearth. This ash pit was 35 cm. north-south, 50 cm. east-west, and 4 cm. deep.

Five 1 m. by 1 m. units were excavated to 10-15 cm. below surface surrounding the eroded hearth and ash dump. The purpose of these units was to examine the area for possible activity loci associated with use of the hearth. The hearth itself was excavated in the following manner: First, the northwest quarter was removed as a full cut to define levels. The remaining quarters were then excavated in two levels (a sterile, brown sand surface level and the main hearth level of charcoal-stained sand and ash). North-south and east-west profiles were drawn. The southwest quarter of the small ash dump was excavated as a profile cut. No differentiation of levels was present, and finally the remainder was excavated as one unit. No evidence of multiple use could be determined in Feature 10 due to erosion of the feature. The small ash dump indictes hearth cleaning, however, which would be indicative of more than one use.

A very small radiocarbon sample from the hearth was sent to the University of Texas for analysis. It was too small to be processed, however. Floatation samples from the charcoal-stained sand and ash level (Level 2) of the hearth yielded only uncharred juniper twigs, indicating contamination from junipers on the site (Donaldson, this volume). Pollen samples from the hearth feature and the ash dump contained juniper pollen, which would be expected from the junipers present in the area. The hearth also contained aggregates of Cheno-am pollen, which could indicate the processing of Cheno-ams (Scott Cummings, this volume). No faunal remains were present within the feature or its surrounding units.

A few lithic flakes were found on the surface of the hearth, in its fill, and in the surrounding area. Five sherds were also found in these areas. These materials were piece-plotted, but no specific activity areas were found. The sherds recovered are Mancos Corrugated (A.D. 900-1200) and do not match sherds from other loci on the site. Two of the pieces are from the same vessel.

Figure 6-18. Site FA 3-3, Locus 9, Feature 10.

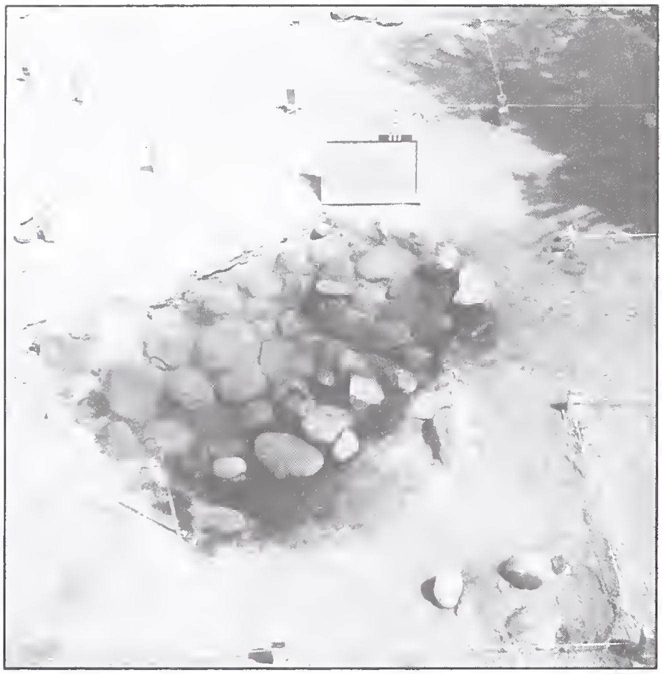


Figure 6-19. Site FA 3-3, Locus 10, Feature 9.

This information suggests that the sherds relate to the use of Feature 10 and can be used to give it a general date range. The earlier end of this range, ca. A.D. 900 or early Pueblo II, suggests possible contemporaneity with several other use-areas on the site. Both the pitstructure and Feature 9, a roasting pit, have radiocarbon dates in the A.D. 900-1000's (Table 6-4) and may have been in use during the same time period.

Locus 10, Feature 9

Locus 10 was in the extreme southwestern portion of the site (Map 6-5) and consisted of an oval, cobble-filled roasting pit (Feature 9). The feature measured 1.76 m. north-south and 1.09 m. east-west (Fig. 6-19). It was 22 cm. deep at its deepest point and consisted of two levels. The top level, or Level 1, consisted of a gray stained mixture of charcoal, ash, and sand. Level 2 was composed of dark black charcoal and ash varying from 10-20 cm. in thickness. Level 2 rested directly on fire-reddened quartzite cobbles which lined the bottom of the pit. The cobbles rested on decomposing sandstone bedrock in most of the pit and on coarse sand along its eastern margin. The pit was dug approximately 10-12 cm. into the decomposing sandstone bedrock.

Eight 1 m. by 1 m. units were placed over the surface stain to examine the feature and its surrounding area. Those outside the feature were excavated down to sandstone bedrock, or sterile coarse sand immediately above bedrock at depths of five to eight centimeters. Feature 9 itself was excavated in six sections in the two levels discussed above. Two north-south profiles and one east-west profile were drawn along the section lines (Fig. 6-20). No evidence of repeated use of the feature or of associated activity areas was encountered in this examination. Ceramics were found within the feature fill, however. These will be discussed shortly.

Radiocarbon dates from Level 2 of the roasting pit include two from the University of Texas and one from Dicarb (Table 6-4). The first sample sent for analysis yielded a reading of 1530 + 80 B.P. (A.D. 437 $\pm$ 193) (TX-4949). A second sample from Level 2 of the pit was sent to Texas as a date check on the first sample. This second sample gave a reading of 870 + 60 (A.D. 1145 $\pm$ 110) (TX-5089). Another sample from the same area was sent to Dicarb; this gave a determination of 980 + 60 (A.D. 1055 $\pm$ 155) (DIC-3001). None of these dates came from a split sample. All are from Level 2 of Feature 9, however. Due to the closeness of the two later dates, the earlier date of A.D. 437 is considered to be a probable error. These later dates also fall within the time range of pottery found within the hearth fill. At the 95 percent confidence interval the ranges of these dates overlap, which could indicate the same period of use. It is also possible that wood of different ages was gathered for use in the same burning. The two later dates might also represent two uses of Feature 9, though visual inspection does not show obvious signs of reuse, such as a sand or sterile level separating two ash levels or an ash dump area where old ash was cleaned out of the pit. One use of the feature seems to be the best interpretation.

Charcoal in Feature 9 was composed of juniper (most commonly) and pinyon, both of which are currently present on the site. Pollen samples contained insufficient pollen for analysis. Floatation samples contained charred juniper seeds, probably related to the use of juniper as fuel, and uncharred juniper twigs, pinyon needles, and hedgehog cactus seeds (Donaldson, this volume and Scott Cummings, this volume). Uncharred materials represent probable contaminants, as all are present in the site area. A pinyon tree overhangs the feature and undoubtedly contributed the needles. No faunal remains were present in the pit fill or in its vicinity. In sum, none of these remains is helpful in understanding what was being prepared in the roasting pit.

No chipped or groundstone occurred in the feature or its surrounding area. Ceramics, however, were present in the pit fill. Twenty-eight pieces of a Mancos Corrugated utility ware jar (A.D. 900-1200), (including five matching pieces) were found in the black ash pit fill. These sherds form a part of one vessel and are burned (overfired?) and brittle. A very small pinch pot was also found in the pit fill. This small pot is referred to by Warren (this volume) as a charm or test pot and discussed by Raish (this volume) as perhaps reflecting the activities of children. None of these sherds directly matches sherds from other loci on the site. Thus, no statements concerning contemporaneity of use can be made on the basis of pottery matches. The range of dates from the radiocarbon samples and the ceramic types present indicate that this feature may have been in use during the time that Feature 10 (hearth), the pitstructure, and perhaps Feature 3 (roasting pit) were in use.

Feature 9 is considered to have been a baking or roasting pit in which vegetable foods were probably prepared, but precisely what foods is unknown (Donaldson, this volume). Two other pits similar to Feature 9 were located in other areas on FA 3-3. One of these (Feature 7) dates considerably earlier (Table 6-4) and contained evidence of animal food preparation. The other pit (Feature 3) dates slightly earlier than Feature 9 and contained some evidence of the presence of vegetable foods in the fill and faunal remains in close association.

Considering the absence of floral, faunal, and artifactual evidence for food processing in Feature 9, and considering the burned sherds and the pinch pot in the fill, it is tempting to suggest that Feature 9 may have functioned as a kiln instead of a roasting pit. Shepard described pit kilns that were apparently similar to Feature 9 (1965:74-94). A Utah pit kiln is also described by Helm (1973:209-217), but it was much larger than the FA 3-3 pit. The Feature 9 pit is morphologically very similar to a kiln discussed by Elyea (1984:84-93), also in an upland setting. That kiln contained considerably more

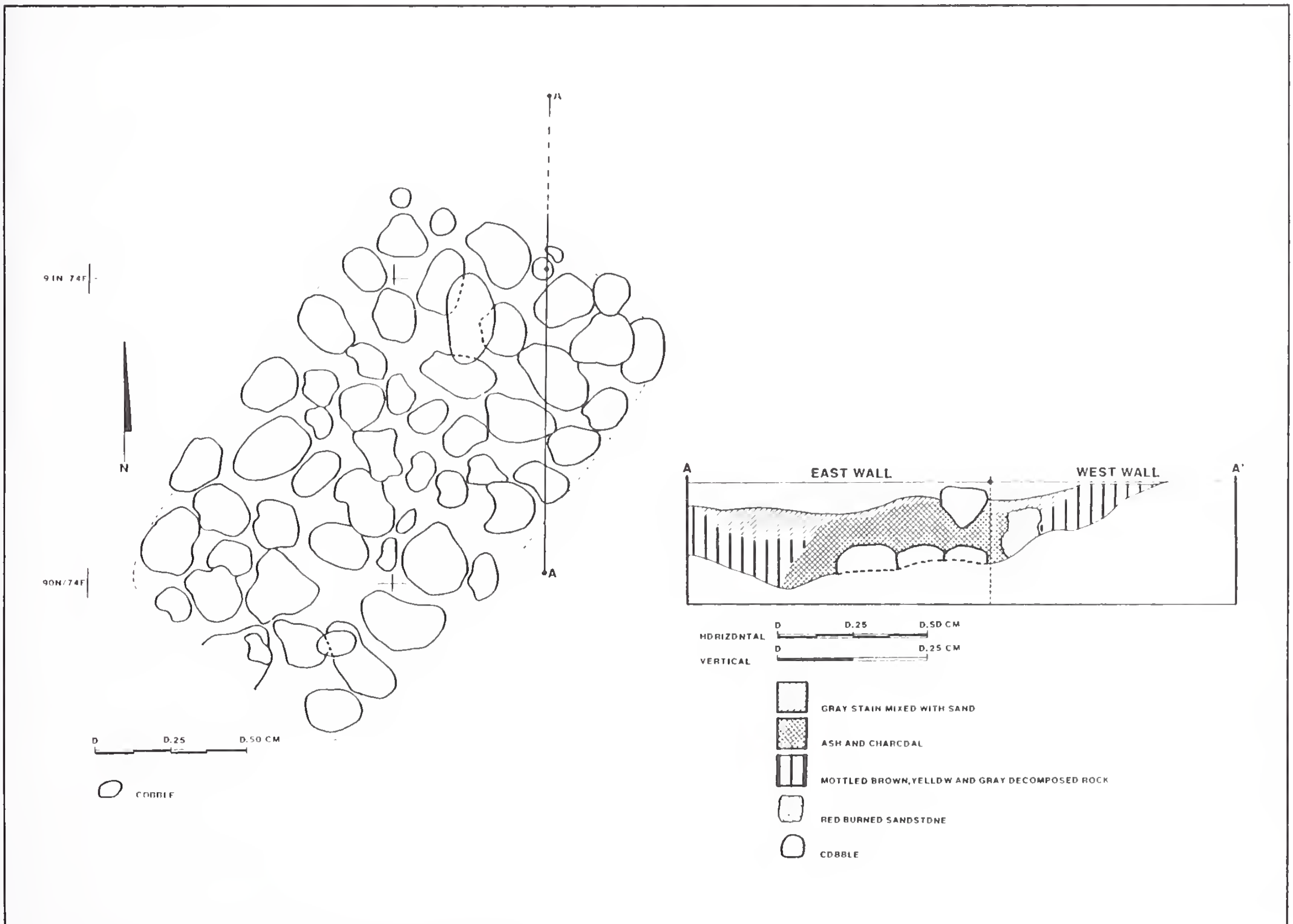


Figure 6-20. Site FA 3-3 Feature 9, plan and profile.

evidence for misfired pottery, however. It is not actually possible to determine if the burned Mancos Corrugated sherds in the pit fill are the result of overfiring or burning during use. They are not warped, deformed, or spalled as is often the case with firing accidents (Shepard 1965:91-93). Clay deposits are present within the immediate vicinity of FA 3-3. On cursory examination, the clay from these deposits is suitable for pottery making, but no ceramic manufacturing areas were defined on the site. Additionally, Shepard stated that juniper was preferred over pinyon for pottery firing since pinyon burns with a smoky flame (1965:77). Both juniper and pinyon charcoal were present in the pit on FA 3-3. With the information available, it is not possible to state definitely that Feature 9 functioned as a kiln. The idea is mentioned here as an interesting possibility that might be examined in future studies on this type of feature. For the current study, Feature 9 retains its original designation as a roasting pit.

Locus 4, Features 3, 11, 14

This area was located in the extreme north-central portion of the site against the sandstone outcrop to the north, and is bounded on the south by a large sandstone boulder (Map 6-5). It is a protected spot and has a long history of occupation. Cultural remains were first indicated in Locus 4 by the tops of several, upright sandstone slabs protruding from the loose, surface sand. By the time excavations were completed in Locus 4, seven 0.5 by 2 m. units and four 1 m. by 1 m. units had been excavated to examine all the features and their surrounding surfaces. The deepest portion of the excavation reached 1.5 m. In descending stratigraphic order features in Locus 4 included a roasting pit outlined with sandstone slabs and filled with quartzite cobbles, an unlined, circular hearth, and a posthole and partial post. Two eroded hearths and activity surfaces will be

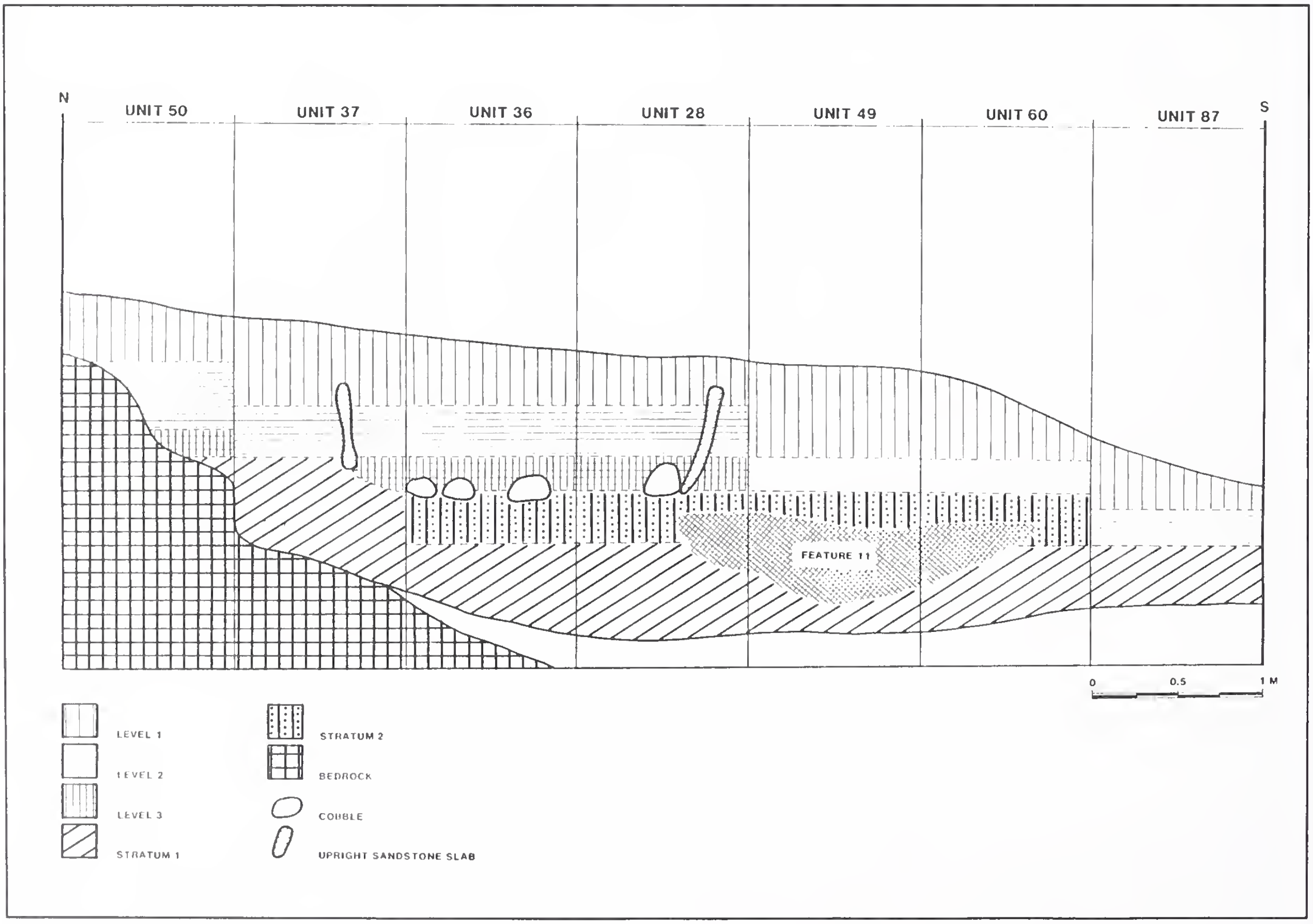


Figure 6-21. Site FA 3-3, stratigraphy of Locus 4.

discussed in terms of their possible relationship to the features (Fig. 6-21).

Feature 3

Feature 3, which was the oval roasting pit, is the uppermost feature in Locus 4 (Fig. 6-22). It measured 1.46 m. northwest-southeast by 87 cm. northeast-southwest, and was outlined by seven fire-reddened sandstone slabs. The pit was 33 cm. in depth from the top of the sandstone slabs to the bottom. The slabs protruded about 7 cm. above the modern ground surface, which is loose, shifting sand. Fire-reddened quartzite cobbles lined the bottom of the feature. Two levels were present in the roasting pit. The first consisted of gray stained sand, while the second was dark black charcoal and ash. This level was 22 cm. deep at its deepest point. The northwest quarter of the feature was removed as one unit to define levels, and the remainder of the feature was excavated by quarters and levels. Northwest-southeast and northeast-southwest profiles were drawn.

A radiocarbon sample from the charcoal and ash level gave a reading of 1140 + 60 (A.D. 845 $\pm$ 175) (TX-4936). As per the earlier discussion concerning radiocarbon dates from this site, this date may be somewhat early. An extra sample from this locus was subsequently dated. It came from the Feature 11 hearth (Table 6-4), and is discussed under that feature.

No artifacts or faunal remains were located within the feature fill. Scant artifacts and burned bone were located in units surrounding the feature, however.[2] These areas are probably related to use of the feature and will be discussed shortly. Botanical remains within the feature fill included charred juniper seeds, and uncharred juniper twigs and hiddenflower (Donaldson, this volume). These last two are probably contaminants since both are present in the area. A large juniper is located immediately south of Feature 3. Charcoal from the feature includes juniper and cottonwood/willow. The juniper, of course, is local. The cottonwood/willow is available along the larger washes and in the Animas and San Juan valleys, and indicates contact with these areas. (Donaldson, this volume). Pollen from the pit consisted of aggregates of juniper, Cheno-am, sagebrush, low-spine compositae and graminae. Scott Cummings suggests that the pollen aggregates probably represent local plants on the site, but might have been used by the inhabitants. In particular, she discusses the fact that aggregates of grass pollen have been rare in this study, and so she considers them to indicate use of this resource. A single grain of buffalo berry pollen was also present. It is also rare in these sites and may indicate use of buffalo berries in the feature (Scott Cummings,

Figure 6-22. Site FA 3-3, Locus 4, Feature 3.

this volume). Thus, it is possible that wild resources such as grasses, Cheno-ams, and buffalo berries were prepared in the pit. It is also possible that the grasses were used in the pit as matting during roasting.

Baking or roasting pits, such as the three found on FA 3-3, are often considered to be roasting pits for vegetable foods such as cactus, or for hunted game. Unfortunately, the pits from this site did not yield solid botanical, pollen, or faunal evidence concerning their use. The best evidence is from this feature, and it is not solid. The other two pit features yielded almost no botanical or pollen information. In fact, an alternative interpretation for one of the pits is discussed under Feature 9.

Seven 0.5 by 2 m. units surrounding the pit were excavated, and items were piece-plotted in an attempt to uncover activity loci associated with the use of Feature 3. These units were excavated in three levels to a depth of approximately 40 cm.

Very light charcoal staining was present in these units, which is probably attributable to Feature 3. Twenty centimeters south of the pit was a small charcoal stain containing small sandstone fragments, cobbles, three potsherds, and one lithic piece. This may represent materials cleaned out of the pit. A few pieces of burned bone were also found scattered in the units surrounding Feature 3, though not in the concentration just discussed. The identifiable burned bone consisted of a small fragment of bird bone, a fragment from a small mammal, and a fragment from a small-to-medium mammal (Akins, this volume). This indicates that animal foods may have been roasted in Feature 3.

The few ceramic pieces from this locus are Mancos Corrugated utility wares (Table 6-5). The lower end of the date range for Mancos Corrugated (ca. A.D. 900) is within the 95 percent confidence interval of the date for this feature of A.D. 845 + 175 (TX-4936). As noted though, the radiocarbon dates from this site may be somewhat early. If this is the case, then the Feature 3 roasting pit would fall within the general time range of another roasting pit (Feature 9), a hearth (Feature 10), and the pitstructure to be discussed shortly (Feature 13).

Features 11 and 14

Excavations in Locus 4 were continued to examine the possibility of cultural remains below the roasting pit and its use area. Approximately 10 cm. below and immediately to the south of the roasting pit a hearth (Feature 11) was located. The northern 10 cm. of the hearth lay under the roasting pit. The hearth was unlined and contained fire-cracked rock fragments, but was not cobble filled. It measured 103 cm. north-south and 87 cm. east-west. It was basin-shaped and was 25 cm. deep at its deepest point (Fig. 6-23). Feature 11 was composed of two levels. Level 1 was a mottled mixture of sand and ash, while level 2, which was 10-15 cm. thick, consisted of light gray ash with charcoal flecks. The sides and bottom of the pit were burned to a light orange color.

Due to the somewhat amorphous surface appearance of this feature, it was excavated in halves rather than quarter sections. The western half was removed first to obtain a profile and define levels. The eastern half was then excavated in the defined levels. The excavation of units surrounding the hearth will be discussed in the following section.

A radiocarbon reading from Level 2 of Feature 11 is 2120 + 80 B.P. (180 B.C. ± 220) (TX-4939). A rerun sample from the same area included charcoal from the hearth and the surface immediately outside the hearth. This sample gave a determination of 1690 + 100 (A.D. 317 ± 258) (TX-5088). This sample had to be combined to

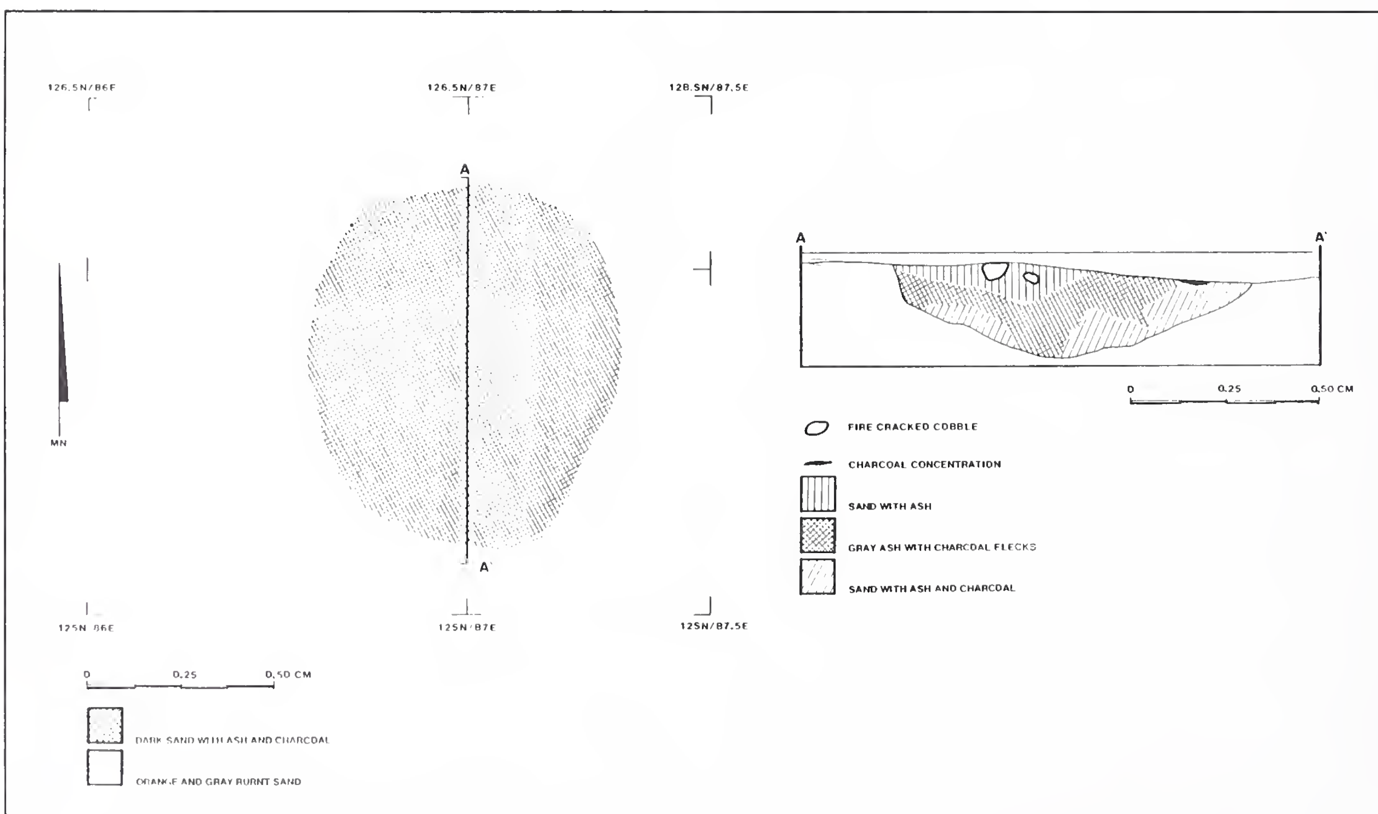


Figure 6-23. Site FA 3-3, Locus 4, Feature 1.

Table 6-5. Sherd Count for Identifiable Ceramic Types, Locus 4, FA 3-3.

Ceramic Type	Feature 3/ Associated Area	Feature 11	Stratum 1	Stratum 2	General	Total
San Juan White McElmo B/W	-	-	1			1
San Juan Gray Mancos Gray	-	-	2	4		6
Mancos Corrugated	1	-	3	4	1	9
Mancos Corrugated (Hovenweep Style)	1	-	2	1	1	5
TOTAL	2		8	9	2	21

reach a sufficient size and must be considered less reliable than the sample strictly from the hearth. It should be viewed as an additional date for the area as opposed to a replacement for the original hearth date. In addition, an archeomagnetic sample was taken from the oxidized hearth rim, but the sample was too weakly magnetized to be processed.

Botanical remains from the hearth included both juniper (most common) and pinyon charcoal, but no other botanical remains were present (Donaldson, this volume). Aggregates of juniper pollen were present within the feature, which accords with the use of juniper as fuel. Oak pollen (perhaps also used as fuel) and cholla cactus pollen were also present. It is possible that Cholla cactus was cooked in the hearth (Scott Cummings, this volume). No faunal remains were found within the fill of hearth feature 11.2

Feature 14 was a posthole with a portion of a partially burned post located 2 cm. below the bottom of hearth Feature 11. The posthole measured 14-16 cm. north-south by 12 cm. east-west. A radiocarbon reading on a small wood sample from the post yielded 2590 + 240 B.P. (805 B.C. $\pm$415) (TX-4935). The post was earlier than the hearth and was associated with an earlier occupation of the locus to be discussed shortly. No other evidence of posts was found in Locus 4. This post may have been used to support an ephemeral shade-type structure in combination with the large boulder 20-30 cm. south of Feature 14.

Strata 1 and 2

Two additional large, amorphous areas of light charcoal stain with widely scattered charcoal flecks were defined within Locus 4 (Fig. 6-21). Due to their amorphous nature, they were not given feature designations. Stratum 1 was the earliest evidence of occupation in the locus. Feature 11 was excavated into this stratum. Stratum 2 was associated with use of Feature 11 and will be discussed first.

Stratum 2 extended roughly 3 m. north-south and 2 m. east-west, with an approximate and varying depth of 10 cm. It consisted of gray, ash-stained sand with scant charcoal flecks, and fire-cracked rock. Lithics, ceramics, and burned bone were present. The majority of the stratum extends downslope from hearth Feature 11. The portion upslope, or north, of the feature appears in rodent burrows. Thus, stratum 2 probably resulted from downslope washing of fill from the hearth. Unfortunately, there was not sufficient charcoal to obtain a date from Stratum 2 other than the date from the previously discussed combined sample.

This stratum was excavated in the 0.5 by 2 m. and 1 m. by 1 m. units used throughout excavations in Locus 4. No activity areas were defined, perhaps due to the eroded nature of the deposit. Though Stratum 2 is considered to be associated with Feature 11, considerable movement and disturbance is apparent in all of Locus 4 due to erosion, root, and rodent disturbance. Ceramics show this disturbance clearly, with both directly matching sherds (corresponding edges) and non-directly matching sherds from the same vessel between Strata 1 and 2, and between these two levels and the upper levels surrounding Feature 3.

Botanical and pollen samples were taken from this stratum. Only uncharred juniper twigs and seeds were present in the botanical sample (Donaldson, this volume). These represent contamination from the juniper adjacent to the area. The pollen sample contained aggregates of juniper pollen, undoubtedly from the same source, and aggregates of Cheno-am pollen. Scott Cummings (this volume) suggests that the Cheno-am pollen represents either plants growing in a disturbed location or use of these plants in the area. Identifiable faunal remains consist of two individuals classed as medium to large mammals, and one black-tailed jackrabbit (Akins, this volume). These materials from Stratum 2 give additional evidence of vegetable and animal foods that were probably prepared in hearth Feature 11.

Artifacts in Stratum 2 included both lithics and ceramics. Identifiable ceramics from the stratum consist of nine sherds of Mancos Gray and Mancos Corrugated utility wares (Table 6-5). Maximum date ranges on these pottery types are A.D. 875-1200.

The 180 B.C.+ 220 date from Feature 11 and the A.D. 317 ± 258 date from the combined Feature 11 and Stratum 2 sample (Table 6-4) indicate at least two uses of the Feature 11/Stratum 2 area. As with many dates from this site, both the initial sample and the rerun combined sample date considerably earlier than the pottery. Thus, the pottery either represents an additional period(s) of use of this specific area, or it was intrusive to Stratum 2. Considering the disturbance noted in the area, the latter is more probable. In any event, the presence of the pottery indicates later uses of the general Locus 4 area by pottery-using groups. Some of this later use may be related to the Feature 3 roasting pit.

Stratum 1 was more extensive than Stratum 2 and was located below it. Stratum 2 and Feature 11 were considerably darker in color than Stratum 1, and were intrusive into the more widespread, lower level. Stratum 1 extended virtually throughout Locus 4, and was represented by very light gray ash-stained sand over an area 6.5 m north-south by ca. 2 m. east-west. The area is bounded on the east by an outcropping of sandstone bedrock and the large boulder, and to the west by a sharp drop into a small wash. Test units indicated that the stain does not extend into these areas. This Stratum ranged from 15 to 25 cm. in depth, and was removed in the same excavation units previously discussed for this locus. Scant charcoal flecking and fire-cracked rock occurred within Stratum 1 as well as burned bone, lithics, and ceramics. Stratum 1 represents an eroded hearth (or hearths) and disturbed activity surface that may have had an ephemeral shelter (represented by the previously discussed post). No hearth source was found, undoubtedly due to erosion and disturbance of the area. The amorphous nature of the stain in combination with the absence of any solid structural evidence, such as a series of postholes, roof fall/wall fall, or daub, indicates that this was primarily an outdoor use area.

A very small radiocarbon sample from Stratum 1 yielded a reading of 2400 + 220 (447 B.C. ± 408) (TX-4940). This sample and the sample from the post overlap if their maximum date ranges are considered (Table 6-4). Both samples are very small with large standard deviations, and for this reason are somewhat suspect. They may have been associated with the same use of the area, or may represent different episodes of use.

Eight potsherds from three different ceramic types were present in Stratum 1. These include the following types: McElmo Black-on-white, Mancos Gray, and Mancos Corrugated (Table 6-5). As discussed for Stratum 2, several of these sherds match sherds from the upper levels of Locus 4, and are considered to be intrusive to Stratum 1.

Botanical and pollen samples contained charred juniper seeds and low-spine compositae pollen (Donaldson, this volume and Scott Cummings, this volume). The charred juniper is cultural, while the role of the low-spine composites is uncertain. The primary food remains deposited in this stratum were animal, however. Akins (this volume) lists the following animals from Stratum 1: cottontail rabbit, kangaroo rat (probably not a food source), collared lizard (probably not a food source), a jackrabbit-sized individual, and an artiodactyl. These five individuals are identified from 57 elements and show processing of rabbit and deer in the features that formed Stratum 1.

In summary, Locus 4 is a favored area with a long history of occupation and reuse by both pre-ceramic and ceramic-using groups. Features in the locus were used to process both vegetable and animal foods, but the emphasis was on the latter.

Pottery types found in the locus have a maximum date range from A.D. 875-1300, with a concentration from A.D. 900-1150. They are associated with the Feature 3 roasting pit. The types present are all San Juan types and indicate use by groups from the local area. The Locus 4 assemblage of 10 vessels consists of 21 identifiable and 7 unidentifiable sherds, and is decidedly jar-dominant. The one McElmo Black-on-white sherd

Figure 6-24. Site FA 3-3, Locus 5, Feature 4.

represents the only bowl form. A jar-dominant assemblage often indicates a day-use site, as discussed by Sebastian (1983). In this case, the ceramic-using component of Locus 4 seems to be a special food processing area related to contemporaneous features on the site such as the pitstructure.

Locus 5, Features 4, 12, 17, 18

Locus 5 is situated in the north-central portion of FA 3-3, 4 to 6 m. east of Locus 4 and several meters south of the sandstone outcrop (Map 6-5). This area contains a completely excavated cobble-ring hearth (Feature 4) and several partially excavated features that will be only briefly discussed.

Features 12, 17, and 18 lie to the east of the cobble-ring hearth and consist of two small ash stain areas and a larger ash stain containing lithics, ceramics, and burned bone. This larger stain may represent an eroded hearth and activity surface, or possibly a small trash scatter. During excavation, it was also suggested that the feature might represent the floor of a structure. Excavations were terminated on these features before sufficient information could be gathered to make a determination.3 They will not be discussed further.

Feature 4

Feature 4 consisted of a cobble-ring hearth (Figs. 6-24 and 6-25) with a cobble-lined bottom. The hearth measured 90 cm. north-south, 1.10 m east-west, and 30 cm. deep at its maximum depth. The hearth was composed of three levels: a level of gray-stained sand (Level 1), a level of dark black charcoal and ash (Level 2) which is approximately 10 cm. thick, and a level of oxidized guartzite cobbles which line the bottom of the feature (Level 3).

The southeast quarter of the feature was excavated first to obtain a profile cut and levels. The remainder of the feature was then excavated in quarters and levels. North-south and east-west profiles were drawn. No evidence of reuse was noted in the feature. The area immediately surrounding Feature 4 was excavated in seven 1 m. by 1 m. units to determine if hearth-associated activity areas were present. These units were excavated to depths of 10 to 20 cm. Along the western margin of the excavated area, the previously mentioned, incompletely excavated features were defined. Their possible relation to Feature 4 is unknown. No activity surfaces were defined in the other excavated areas.

A radiocarbon sample from the ash and fire-reddened cobble level (Level 3) of Feature 4 gave a reading of 1860 + (A.D. 120 ± 120) (TX-4946). A sample from the area surrounding the feature was also taken, but was too small to be processed. As discussed for all the radiocarbon dates, the date may be somewhat early. Artifacts from the feature itself and the immediately surrounding area shed no light on this question. One lithic item was present within the feature fill; there was no pottery.

Pottery from the units contiguous with the hearth consisted of three Mancos Gray sherds and one unidentified whiteware. The Mancos Gray sherds are from the same vessel, and also match a sherd from Feature 18 (one of the incompletely excavated features) and one from the surface of the Locus 5 area. Thus, they are considered to be intrusive to the Feature 4 area. Feature 4, then, probably represents a pre-ceramic period of use as indicated by the radiocarbon date.

There were no faunal remains within the hearth fill. A few, however, were present in the adjacent units. These form one individual of a medium to large mammal (Akins, this volume), and indicate the possibility that hunted game was prepared in the feature. The majority of evidence, however, indicates that the hearth was used to prepare vegetable foods.

Botanical remains showed contamination by junipers and composites on the site, and the presence of juniper (most common) and pinyon charcoal (Donaldson, this volume). The pollen samples from the hearth fill are more informative concerning the function of the feature. Aggregates of juniper, Cheno-am, Tidestromia, and grass pollen were present in the feature fill. Scott Cummings is of the opinion that juniper was used as fuel (as also indicated by the charcoal evidence), and that cheno-ams, including Tidestromia, as well as grasses and possibly prickly pear, were cooked in the hearth. She discusses the possibility that the Cheno-ams and grasses were used as accessories during the roasting or cooking of the Opuntia. Zea pollen was also present in the feature fill, which indicates cooking of corn in the feature in addition to the other vegetable foods.

Locus 6, Features 13, 15, 5, 7, 6

Locus 6 was located in the northeastern portion of the site. It was bounded on the north by the sandstone outcrop and on the east by a small wash (Map 6-5). This area was the most complex on site FA 3-3, and consisted of a pitstructure (Feature 13), a fire-cracked rock and ash midden (Feature 6), a roasting pit (Feature 7), and a cobble-ring hearth (Feature 5) eroding into a small wash.

Pitstructure (Feature 13, 15)

The pitstructure (Map 6-6) was first encountered during excavations conducted to determine the southern extent of the large ash and fire-cracked rock midden. After

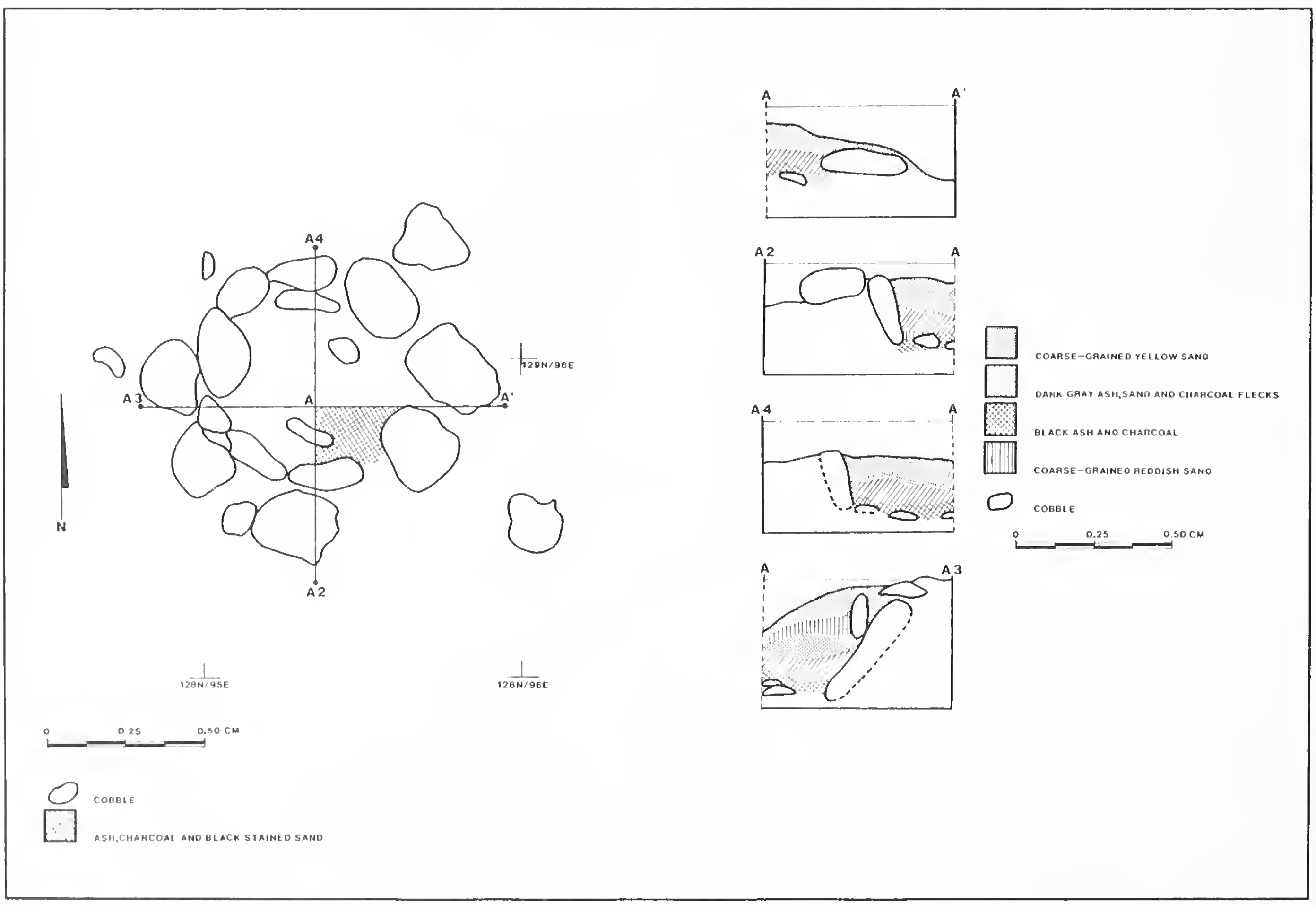
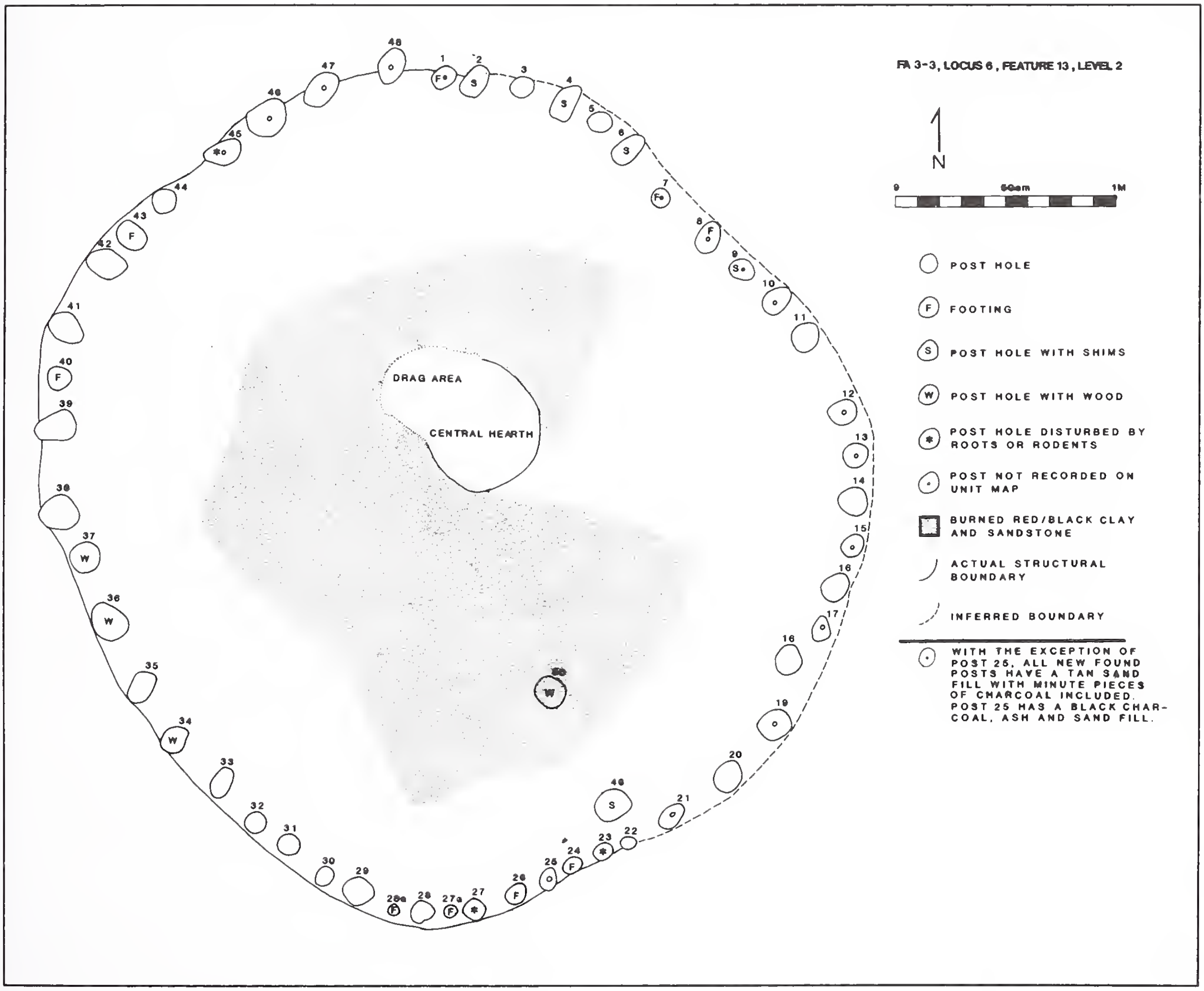


Figure 6-25. Site FA 3-3, Locus 5, Feature 4, plan and profile.

excavations showed very light staining and sterile sand indicating that the midden had tapered off, a new stain was encountered further to the south. Excavation of this stain revealed a possible posthole excavated into the underlying, soft sandstone bedrock. The only surface manifestation of the buried structure was a small area of light charcoal staining to the south of the midden. Subsequently, a 3 m. by 3 m. unit was excavated to depths of 20 to 40 cm. through essentially sterile, lightly stained sand. A few scattered lithics and ceramics were found in this fill. At approximately 40 cm. below ground surface, a layer of dark black charcoal and ash was encountered. Pieces of burned daub, some with twig impressions, and burned wood were present in this layer of burned roof and wall fall. Upon reaching this layer, the larger excavation unit was broken down into nine 1 m. by 1 m. units to complete excavation of the defined pitstructure. These units were excavated down to the bedrock floor of the structure at depths of 15 to 25 cm. Artifacts were provenience-plotted within these units to determine their position in roof fall or in floor context. An additional series of nine 1.5 by 1 m. units were excavated around the three sides of the structure that do not abut the Feature 6 midden area (which borders the northern portion of the structure). These units were examined for activity areas or trash deposits. None was found. Addi-



Map 6-6. Site FA 3-3, Pitstructure.

tional shovel tests and auger tests were placed around the Locus 6 area and for 10 m to the south of the structure to test for the presence of further buried features or structures. In all, 16 auger tests and 9 shovel tests were used. No definitive evidence of features was found, but these tests were discontinued before they were completed. Moreover, planned 1 m. by 1 m. test pits were never started. Excavations on the site were discontinued due to removal of this parcel from consideration for the land exchange.3

The pitstructure was roughly circular in shape, measuring 3.6 m. north-south and 3.9 m, east-west. It was 50 cm. deep along the western side, which was excavated some 30 cm. into the soft, crumbling sandstone. The ground surface slopes down towards the east with the sandstone bedrock very near the surface along the eastern margin of the structure. The eastern portion of the structure was between 5 and 15 cm. deep. The pitstructure was outlined by 49 postholes, three of which had portions of wood posts remaining (Map 6-6). Another posthole with a post segment was located 80 cm. from the southern wall of the structure and probably formed part of an interior structural feature. An extra support post (#49) was also located in this area, set in 15 cm. from the ring of posts.

The burned roof fall/wall fall and the postholes indicate a jacal superstructure. Roof entry is assumed since no entryway was found. The floor of the structure consists of unmodified sandstone bedrock with no subfloor features excavated into the bedrock. A central hearth (Map 6-6), Feature 15, was excavated 17 cm. into the bedrock floor at its deepest point. The hearth was circular, 62 cm. north-south by 60 cm. east-west, and was clay lined. The fill consisted of charcoal-stained sand, very small flecks of charcoal, and some burned roof fall material. A 20 cm. area of dark black charcoal on the bedrock floor extended northwest from the hearth. This appears to be a result of hearth use or cleaning.

Dates from the pitstructure are complex and somewhat difficult to interpret. They are from samples from various areas of the burned roof fall material and range over a considerable time span (Map 6-6). There are a total of six radiocarbon dates (Table 6-4) and one thermoluminescence date from this material. There was insufficient charcoal within the hearth to obtain a sample from that feature. A large number of dendrochronological samples were taken from posts and from roof fall. These were sent to the University of Arizona for analysis, but they were all juniper and were not dateable.

The first three radiocarbon samples sent to the University of Texas gave the following reading: 1870 + 70 (A.D. 117 + 123) (TX-4944), 1820 ± 90 (A.D. 202 ± 213) (TX-4937), and 1800 ± 100 (A.D. 212 ± 213) (TX-4938). A second set two of samples from the same areas was also sent to the University of Texas (Map 6-7). The readings from these samples were 2020 + 110 (80 B.C. ± 295) (TX-5085) and 1060 ± 100 (A.D. 987 ± 213) (TX-5086). The final sample from this area was sent to Dicarb and gave a reading of 1040 ± 60 (A.D. 1010 ± 130 (DIC-2999). A thermoluminescence date on burned daub (Map 6-6) was A.D. 1360 + 50 (University of Missouri).

Since all these dates are from burned roof fall and wall fall material, it is not possible to interpret them as representing periods of reuse. Use in the first centuries A.D. is incompatible with ceramics found in floor context. These consist of parts of two different vessels of Cortez Black-on-white (A.D. 900-1075) (Table 6-6). The date range for Cortez Black-on-white fits with the A.D. 987 + 213 and the A.D. 1010 ± 130 radiocarbon dates. These are considered to be the best dates for occupation of the structure. The earlier series of dates is either in error, or represents use of old wood. Since the burned wood in the roof fall was fragmented, it was not possible to determine if any samples were from the same piece. Widely divergent dates from the same piece would indicate an error. Bearing this in mind and considering that there are four early dates with overlapping time ranges, use of old wood for construction is the best explanation for the early dates from the pitstructure roof fall. The thermoluminescence date from burned daub may represent a later burn of the already abandoned and partially burned structure.

Lithics and ceramics were scattered about the floor of the pitstructure, and do not represent any definable activity areas (Map 6-6). The units excavated around the structure also contained scattered artifacts but no features or recognizable activity areas. Ceramics came from the structure floor, roof fall, fill, and immediately surrounding areas (Table 6-6), and consisted of 15 vessels composed of 11 identifiable sherds and 13 unidentifiable sherds. Of the vessels, 13 are jars, one is a bowl, and one a ladle handle. The ceramic types are San Juan wares, which indicate local contacts, and Captain Tom Corrugated, a trachyte-tempered utility ware. This latter type, represented by one vessel, indicates some contact with the Chuska area. The maximum time range for the pottery types is A.D. 875-1200 with an emphasis on the A.D. 900-1050 period. As just discussed, these dates fit well with two of the radiocarbon dates from burned roof fall from the structure.

Utility ware jars make up 86.7 percent of the assemblage while the other forms compose the remaining 13.3 percent. Although such a high percentage of jars often indicates a day-use or storage site (Sebastian 1983) (Raish, this volume), Locus 4 appears to have been a

Table 6-6. Sherd Count for Identifiable Ceramic Types, Locus 6, FA 3-3.

Ceramic Type	Pit-Structure Fill	Pit-Structure Roof Fall	Pit-Structure Floor	Midden	Roasting Pit and Area	Cobble-Ring Hearth and Area	General	Total
Chuska Gray Captain Tom Corrugated	-	-	-	-	-	-	3	3
San Juan Gray Mancos Corrugated	4	-	-	8	-	-	1	13
San Juan White Cortez B/w	-	2	5	-	-	-	-	7
Chuska White Nava B/w	-	-	-	-	-	1	-	1
TOTAL	4	2	5	8	0	1	4	24

habitation area. It fits closely with the pithouse ceramic assemblage described by Mills (1986) (an average of 84.45 percent plain jars, 5.05 percent decorated jars, and 10.50 percent decorated bowls).

Botanical and pollen samples from the pitstructure fill, roof fall, floor, and its immediate environs are uninformative. The only cultural remains indicate the use of juniper in construction and as fuel. Botanical and pollen samples from the hearth fill are more informative. They also indicate the use of juniper as fuel. In addition, grass pollen and a single grain of pricklypear pollen were present in the hearth. These lead Scott Cummings to suggest that grass seeds may have been parched, and pricklypear possibly prepared, in the feature (Scott Cummings, this volume). Botanical remains from the hearth consist of a charred juniper seed and a possible corn cupule. This is the only evidence for domesticates in association with the structure (Donaldson, this volume). Faunal remains from the Feature 13 area indicate at least four animals: one mule deer, one small mammal/bird, one medium mammal/bird, and one artiodactyl. Unidentified eggshell was recovered from a unit adjacent to the structure. A burned bone awl from an artiodactyl shaft fragment was plotted on the floor of the pitstructure. These remains are scant, but they do indicate the presence of animal foods and both wild vegetable foods and possibly domestic ones.

These remains do not give a strong indication of season of occupation, (Akins, Donaldson, and Scott Cummings, this volume). It is not possible to determine if the structure was seasonally occupied or occupied year round. An interior hearth is present, which would indicate occupation during the cold season. It was not heavily used, however, so the cold season was not the major time of use.

Portions of the large midden stain that extends north of the structure may be related to use of it. Sherds from a Mancos Corrugated jar were found within the midden. The early part of the time range of Mancos Corrugated corresponds to the best dates for occupation of the structure. The midden, which is discussed in the following paragraphs, seems to be the product of use of the several features present in Locus 6. The structure was also contemporaneous with several other features on the site, which may have formed special-use areas related to occupation of the pitstructure. These consist of the roasting pit in the extreme southwestern portion of the site (Feature 9), the roasting pit in Locus 4 (Feature 3), and the eroded cobble ring hearth near the center of the site which was dated on the basis of ceramics (Feature 10).

Figure 6-26. Site FA 3-3, Locus 6, Feature 7.

Feature 7

Feature 7 was a cobble-filled roasting pit located at the northwestern edge of the Feature 6 midden area (Fig. 6-26). It was located 3 m. north of the pitstructure but was not associated with use of it. Radiocarbon dates from Feature 7 indicate that it was in use earlier than the structure. Feature 7 was oval in shape and measures 87 cm. north-south by 148 cm. east-west, and was 23 cm. in depth. Fire-reddened quartzite cobbles filled the pit. The pit contained two levels. The uppermost level consisted of charcoal-stained sand with light charcoal flecking, while the lower level was composed of deep black charcoal and ash which was approximately 10 cm. in thickness. The majority of the fire-cracked cobbles rest on top of this level. The southeast quarter of the feature was removed as a profile unit. The remainder of the pit was excavated in quarters and levels to obtain north-south and east-west profiles. One meter by one meter units were excavated around Feature 7 to expose any activity areas that might be associated with the roasting pit. No specific areas were defined, although the Feature 6 midden lies immediately to the south of Feature 7.

Three radiocarbon samples from the feature were dated. Two samples were sent to the University of Texas in the first series of dates. Later a split, or retained, portion of one of the samples was sent to Dicarb Radioisotope Co. The sample from level 1 of Feature 7 yielded a determination of 2230 + 70 (285 B.C. + 125) (TX-4941). The other sample sent to the University of Texas yielded a reading of 1500 ± 60 B.P. (A.D. 515 ± 100) (TX-4942).

This sample was from Level 2 of the feature, located stratigraphically beneath the Level 1 sample. The dating reversal between Levels 1 and 2 may have resulted from reuse and disturbance of the feature, or from contamination of the Level 1 sample. Ample evidence of hearth cleaning and dumping, indicating reuse, was present in the midden to the south of Feature 7. Root disturbance was also present throughout the feature, which could cause mixing of the levels. Additionally, the Level 1 sample dispersed throughout Level 1 was collected from the screen, and was close to the surface (3 cm. below surface). Thus, it may have been contaminated from other sources and should be regarded with some degree of suspicion.

A retained portion of the Level 2 sample, which dated A.D. 515 + 100, was sent to Dicarb for a dating check. This second portion gave a reading of 1870 + 60 (A.D. 117 ± 123) (DIC-3000). Since these two dates are from the same sample, some sort of error is indicated. It was impossible to tell, though, if the sample was composed of only one piece of wood. Portions of the sample, which was quite large, may have included charcoal fragments from wood of different ages. The best interpretation of the roasting pit is that it represents a feature that was used and reused sometime between ca. 0 A.D., or even earlier, and ca. A.D. 500. Thus, its use occurred before the occupation of the structure by groups using ceramic types such as Cortez Black-on-white and Mancos Corrugated.

No artifacts or faunal remains were located within the feature fill itself.2 Plant remains, in the form of uncharred twig fragments, indicate contamination only from junipers on the site. Charcoal used in the pit consisted of both juniper and pinyon, with juniper more common (Donaldson, this volume). Units contiguous with Feature 7 contained no ceramics and only one lithic piece. There is no evidence for the use of plant foods in these surrounding units, either. Bone is present, however, and indicates that cottontail rabbit and a medium-to-large mammal may have been cooked in the pit (Akins, this volume), and subsequently cleaned out of it. The function of Feature 7 seems to have been the preparation of animal, rather than plant, foods.

One additional radiocarbon date was obtained on charcoal dispersed through an 80 cm. area immediately south of the pit feature. This sample gave a reading of 2350 + 50 (507 B.C. ± 243) (TX-4945), and gives added support to the idea of an earlier episode of use shown by the suspect date from Level 1 of the roasting pit, as discussed previously (TX-4941).

Feature 5

Feature 5 was located in the extreme northeast corner of Locus 6 (Map 6-5), 4 m. northeast of the pitstructure. Feature 5 was a badly disturbed, cobble ring hearth eroding into a small wash along the eastern margin of the site (Fig. 6-27). The hearth abutted the Feature 6 midden area on its southern and western sides. It appeared as a darker stain, and a cluster of fire-cracked quartzite cobbles, within the overall, lighter midden stain. The hearth measured approximately 1 m. by 1 m., but this is an estimate made necessary by erosion of the eastern portion of the hearth. It was 10 cm. in depth. Fire reddened cobbles formed a partial, disturbed ring and were present within the hearth fill. The hearth fill consisted of loose, stained surface sand covering the 10 cm. thick level of more darkly charcoal-stained sand. The northeast quarter of the hearth (including the portion slumping into the wash) was removed as a profile cut to obtain level and profile information. The remainder of the feature was excavated in levels. One meter by one meter units surrounding Feature 5 were excavated to expose any activity areas that might have been associated with the hearth. Scattered artifacts were present, but no specific areas were defined. The midden lies immediately to the south of the hearth.

Figure 6-27. Site FA 3-3, Locus 6, Feature 5.

There was insufficient charcoal within the remains of Feature 5 to obtain a radiocarbon sample. Fill from the hearth contained no lithics and only one unidentifiable plainware sherd. Surrounding units also contained no lithics. Intrusive bottle glass and one Nava Black-on-white sherd (A.D. 1100-1300) were present in the units contiguous with the feature. Pollen and floatation samples from the feature fill were not informative. All the botanical remains were uncharred,and included juniper twigs and seeds, composites (probable contaminants), and tansy mustard (Donaldson, this volume). The uncharred nature of the botanical remains makes it unlikely that they represent prehistoric use. The pollen sample showed no evidence of economic use of plants (Scott Cummings, this volume). The majority of the faunal remains were found within the feature fill itself, and included mule deer (an antler fragment), black-tailed jackrabbit, and an unidentified medium-to-large mammal (Akins, this volume).

The function of this hearth was to prepare animal foods, and may have been related to use of the structure. The eroded state of the hearth makes it impossible to determine if the feature represents single or multiple uses. The Nava Black-on-white sherd found adjacent to the hearth could indicate that the feature was used after occupation of the structure by a group from the Chuska region or with contacts to that region. The zone around the hearth is quite disturbed, however, as indicated by the modern glass fragments. The sherd cannot be definitely associated with the hearth. Thus, the best interpretation of Feature 5 is that it either represents use by occupants of the structure or by a later group either from the Chuskas or with contacts to the Chuskas.

Feature 6

Feature 6 was the previously discussed midden that lay between the pitstructure and Features 5 and 7. It consisted of charcoal-stained sand, charcoal flecks, ash, fire-cracked rock, burned bone, lithics, and ceramics (Fig. 6-28). The stain area spread 3.2 m. north-south by 5 m. east-west at its maximum extent, had very irregular boundaries, and varied in intensity and depth. It ranged from 10-25 cm. in depth, with an intermingled mixture of lightly stained sand, darkly stained sand and ash, and loose yellow-brown wash sand. There is ongoing washing in the area. The midden apparently resulted from the use of the pitstructure, roasting pit, and cobble ring hearth, and perhaps from some now indistinguishable feature removed by erosion. Feature 6 was excavated in 1 m. by 1 m. units. Artifacts and samples from the various interfingered, differently-colored stain areas, and from the wash sand, were plotted separately in the field. Later analysis showed considerable mixture among

Figure 6-28. Site FA 3-3, Locus 6, Feature 6.

compositae, which Scott Cummings (this volume) interprets as resulting from either cultural discard or the presence of these plants in a disturbed area. The latter seems the most likely interpretation. Faunal remains from the midden consisted of 49 elements, which represent five individuals. These include three cottontail rabbits, one black-tailed jackrabbit, and one rodent (Akins, this volume). Akins is of the opinion that the rodent was consumed, since the bone is burned.

Ceramics from Feature 6 consist of eight sherds that form one vessel of Mancos Corrugated utility ware (Table 6-6). The early part of the time range of Mancos Corrugated (A.D. 900-1200) concurs with the tenth century occupation dates of the structure (Table 6-4), and supports the view that at least part of the midden was produced by occupants of the structure.

levels and little point in maintaining the levels as distinct units. Thus, the Feature 6 midden levels are combined in the following discussion.

Charcoal from the trash dump was insufficient to obtain a sound radiocarbon date. One small sample was sent for analysis, but it was too small and had to be disregarded. Samples from the stain area reemphasize the dominance of faunal remains over floral ones, as was seen in the other features.

All botanical remains were uncharred, indicating that they probably do not represent prehistoric use. Uncharred juniper twigs and seeds, tansey mustard, and composites are present (Donaldson, this volume). Pollen samples contain aggregates of Cheno-ams and low-spine

Surface

A complete surface collection was made during testing of FA 3-3. A few remaining items were collected during excavations on the site. All items were provenience-plotted. The lithic artifact distribution is discussed by Schutt (this volume).

Ceramics from the surface (Table 6-7) mirror those found in the loci containing ceramics with respect to ware, type, form, and time range. The pottery types indicate that the occupation by ceramic using groups was primarily during Pueblo II, with an emphasis on early Pueblo II. The majority of types are local San Juan wares, indicating occupation by groups from the middle

Table 6-7. Testing Phase Surface Collection Sherd Count for Identifiable Ceramic Types, FA 3-3.

Ceramic Type	Number	Percentage
Naschitti B/w	1	1.9
Tohatchi Banded	2	3.8
Captain Tom Corrugated	1	1.9
Mancos Gray	16	30.8
Mancos Gray/Mancos Corrugated	3	5.8
Mancos Corrugated	29	55.8
Total	52	100.0

San Juan River area. Two sherds from identifiable types (Naschitti Black-on-white and Captain Tom Corrugated), as well as eight unidentifiable plainware sherds and three unidentifiable whiteware sherds, contain trachyte temper. The unidentifiable sherds may be plain portions of the identified, trachyte-tempered utility and whiteware types. These types show minor contact with the Chuska region. The only other intrusive sherds are two pieces from a Tohatchi Banded jar, which is a Cibola grayware and shows very minor contact with the Cibola area to the south. These two sherds represent the only Cibola wares found on the site. The surface collection is a jar-dominant assemblage, as was the subsurface collection. Of the pottery identifiable as to type, only the Naschitti Black-on-white represents a bowl form. The three unidentifiable, trachyte-tempered whitewares form a vessel match that is also a bowl form. These probably form undecorated portions of the Naschitti Black-on-white bowl.

Summary and Interpretation

Time Range of Occupation

As the preceeding description demonstrates, site FA 3-3 showed ample evidence of reoccupation over a considerable time span. Radiocarbon dates and pottery types indicate major periods of occupation from Basketmaker II (or En Medio phase from ca. 800 B.C. to A.D. 400 [Irwin-Williams 1973]) through Pueblo II. The thermoluminescence date of A.D. 1360 + 50, a Nava Black-on-white sherd (A.D. 1100-1300), and a McElmo Black-on-white sherd (A.D. 1050-1300) show possible later visits to the site. The Nava Black-on-white shows minor contact with the Chuska region, which occurred also during the Pueblo II occupation. If the early radiocarbon dates from features with no comparative samples and no diagnostic artifacts are accepted, then FA 3-3 shows two periods of occupational emphasis. The first was during Basketmaker II and includes two cobble ring hearths (Features 1 and 4), a roasting pit (Feature 7), two unlined hearths (Features 2 and 11), and the amorphous stain in Locus 4 referred to as Stratum 1. These episodes may have run from 640 B.C. through A.D. 450, and represent recurrent uses of the site area. The second time period of major occupation on FA 3-3 was during early Pueblo II. Some or all of the use areas dated to this time period may represent contemporaneous features. These include the pitstructure, two roasting pits (Feature 3 and 9), and one and possibly two eroded cobble ring hearths (Features 5 and 10). These dates indicate that the site was not used during Basketmaker III and Pueblo I times. If the dates are correct, this absence is an interesting question for future research. There is ample evidence for upland Basketmaker III and Pueblo I occupations on other sites in the study areas such as FA 1-6; this is simply not present on site FA 3-3.

Site Function

Site FA 3-3 is in a protected location against a sandstone outcrop and shows considerable reuse over time. The site is located in the uplands where both wild plant and animal foods were available. Floral, pollen, and faunal analyses indicate that both wild plant and animal foods were procured around the site and prepared on it (Akins, Donaldson, and Scott Cummings, this volume). Archeological evidence indicates use of the following wild plants: juniper, Cheno-ams, grasses, buffalo berry, prickly-pear, and cholla. Several of the features may have been used to prepare the prickly-pear and cholla. Juniper and pinyon were the primary fuel woods. Prehistoric faunal remains demonstrate the use of mule deer, cottontail rabbit, and black-tailed jackrabbit on the site. Features on the site indicate that animal food preparation was emphasized over plant food preparation. It is not possible to determine if this emphasis changed over time. Scant evidence for corn was present from two features. Corn was consumed on the site but was probably not grown at it (Scott Cummings, this volume). The emphasis at FA 3-3 was on wild, not domesticated, foods.

Through time, the site served as both a special-use locus and a habitation locus. The earlier, En Medio phase occupations represent repeated uses of the area for plant and animal food preparation, as represented by the hearths and roasting pits. The site reflects repeated uses as an upland campsite for the procurement and processing of wild animal and plant (cactus) foods as a part of the En Medio phase subsistence strategy. Resources present, primarily from pollen information, indicate use in late summer to fall, and perhaps also in the spring.

The later, early Pueblo II occupation has a narrower date range, and may represent fewer occupations. As during the earlier occupations, wild animal and plant resources were emphasized during the early Pueblo II uses of the site. Most floral evidence comes from pollen, and is scant. The information available indicates occupations in late summer to fall, and perhaps spring. This information is primarily from the Feature 3 roasting pit. The structure itself does not yield strong evidence of season of occupation.

The best interpretation of this time period is that it probably includes both short term special-use and longer term special-use occupations. The pitstructure probably represents a seasonal occupation oriented to the procurement of wild game and plant resources by groups resident at lower elevations in the major drainages. Ceramics indicate occupation by local groups with some contact with the Chuskas. A seasonal occupation, as opposed to year-round, permanent residence, is suggested for several reasons. The isolation of the structure, the lightly used interior hearth and lack of storage features, and the very scant evidence for domesticated crops (Scott Cummings, this volume) suggest seasonality and a special-use occupation.

Notes

1. Recently there has been discussion and reevaluation of the nature and role of wild resource gathering camps in Puebloan economics, and the consequent appearance of wild plant foods in the archeological record. It has been suggested from a review of ethnographic information concerning Puebloan plant gathering practices, conducted by Sebastian (1983: 403-419), that a considerable amount of gathering, at least among historic groups, was conducted quite close to home. Such forays were accomplished during a day or afternoon, and would leave very minimal archeological remains or none at all. These trips would not require the participants to set up camp as they would return home at night. Thus, Sebastian feels that gathering camps as a site type are overrepresented in archeological studies. She is of the opinion that many sites identified as gathering camps may actually represent agricultural activity such as fieldhouses or field monitoring situations, which might require only an ephemeral structure.

   The possibility that FA 3-6 might represent a field-monitoring situation during some or all of its occupations was considered during interpretation of the site. As stated previously, a charred corn cupule was found in Locus 1, and crops could have been grown in sandy areas by washes near the site. A major agricultural function for the site was rejected, however, for the reasons discussed below. These include the kind and quantity of floral, pollen, and faunal remains found on the site, and the season of major occupation.

   Both floral and pollen evidence are heavily weighted toward wild plant resources with no pollen evidence for cultigens. Faunal evidence indicates the presence of an additional, valued wild resource that was undoubtedly obtained from the site. The site location, moreover, is in an upland zone where wild floral and faunal resources can be found. Upland fields are known too, of course, but the prime agricultural land of the area is located some kilometers from the site in the floodplains of the rivers of the area. The soils of the area of the site are very poor for agriculture (Appendix 6-1).

   As far as floral remains are concerned, however, evidence of cultigens does not necessarily have to be present to indicate that a site had been used for field-monitoring purposes. According to Sebastian's ethnographic research (1983) into what activities would be conducted and what foods consumed at fieldhouses, wild foods were often consumed at the fieldhouse while waiting for crops to mature, and parties often went out from fieldhouses to gather wild foods. Major occupations at FA 3-6 probably occurred during the late summer and early fall, however, which would fall during the time of harvest.

   During this time, the corn would be mature or approaching maturity, and people would be bringing the crop in and preparing to transport it to the main habitation. Even if it were not being processed at the fieldhouse, it seems that this more-than-casual contact with the crop would introduce more evidence for domesticates into the archeological record than is present on FA 3-6. Before an agricultural function could be proposed for a site like FA 3-6, more evidence of cultigens and agricultural features should be present.

2. Due to a recording error when faunal remains were sent for analysis, some faunal remains were mistakenly listed as being within the fill of Features 3 and 11, Locus 4, site FA 3-3. These remains were actually from units <u>contiguous to</u> the features, but are considered to be associated with use of these features. This also happened with faunal remains from Features 5 and 7 in Locus 6, FA 3-3.

3. Excavations were discontinued since the area of site FA 3-3 was removed from consideration for the Elena Gallegos Land Exchange. Crews were moved to sites in areas that were still being considered for exchange.

Appendix 6-1 • Soils Analysis

Steven McWilliams

Introduction

In order to determine areas of cultural use and the sources of materials used to make mortar, several samples were collected from Farmington area sites. Archeological interpretations of the results have been detailed elsewhere in this volume (Raish, this Chapter). This report describes the technical aspects of the analysis.

Overview

Changes in pedologic characteristics due to land uses are well documented (e.g. Sandor, Gersper, and Hawley 1986a, 1986b, 1986c). Such studies have shown that human activities often cause changes in soil properties. Past cultural activities that altered soils may have been either intentional (e.g. preparation of structural floors or agricultural fields) or unintentional (e.g. compaction of unprepared living surfaces or disposal of occupational refuse). Different activities alter soils in specific patterns.

The ability of a soil to retain the effects of use depends on the stability of the area and of the property being investigated. Phosphorus in soil is highly associated with human activity and is relatively stable. Clays also are stable and form over a very long period of time. The idiosyncratic composition of individual clays developing under specific soil-forming factors facilitates their use in sourcing studies. In general, soils that have been culturally altered retain evidence of this for a long time, unless destroyed by erosion or changed by later activities. Cultivation causes changes to soils that can be discerned after as long as 900 years (Sandor, Gersper, and Hawley 1986a, 1986b, 1986c) or even longer.

Samples

FA 3-6

FS 662, FS 664, FS 666 — Lithic scatter about 50 meters from hearths of main site.

FS 525, FS 535 — Light ash stain within one meter of hearth.

FS 721, FS 731, FS 748 — Dark hearth areas that have apparently produced the widespread ash throughout the site.

FA 3-3

FS 186 — Non-cultural areas of suspicious cobble deposition.

FS 182 — Hearth

FS 384 — Gray material found within one meter of a hearth

FA 1-6

FS 278 — Stained area three meters north of structure.

FS 336 — Clay source.

FS 341 — Clay source.

FS 362 — Clay nodules from Feature 3 structure.

FS 394 — Adobe-like material outside structure.

FS 405 — Melted adobe outside structure.

FS 432, FS 433, FS 435 — Possible mortar, outside structure.

FA 2-13

FS 238 — Area showing heavy charcoal staining.

FS 328 — Feature defined by concentration of charcoal and fire-cracked rock.

FS 713 — Feature defined by dense concentration of artifacts and fire-cracked rock.

Analytical Methods

Samples were analyzed for pH, calcium carbonate equivalence, particle class size, total soluble phosphorus, total nitrogen, or clay type, depending on the questions being asked. The pH was determined by the colormetric method. Alkaline earth carbonates were derived using the volumetric calcimeter method. Particle class size was determined by the hydrometer method. Total nitrogen was derived by the Kjeldahal method (a wet oxidation procedure) and total soluble phosphorus by the sodium bicarbonate method. Clay type and composition were determined by x-ray diffraction.

Results and Conclusions

Athough the samples were taken from archeological sites, not field locations, the results are still usefull to indicate the agricultural potential of the local environment. Soil pH is the measure of the hydroxyl ion content and is a result of the pedogenic processes particular to the site over time. Soil pH was consistently in the range of 8.3 to 8.4. This level would indicate problems in micronutrient and iron availability for plant growth. The calcium carbonate equivalence was in the range 5.8 to 6.8%. This level would indicate that the soil has excessive levels of carbonates of calcium and magnesium, which would cause productivity problems and assist in denitrification. Cultivation of crops would be difficult even with irrigation. The soils are very coarse-textured, ranging from sand to sandy-clay loam. These textures would have a low water-holding capacity. Both pH and calcium carbonate equivalence levels indicate a high salt content. The semi-arid climate common to the high desert would produce drought stresses in most plants during parts of the year, and the high salt levels would produce high osmotic stress for most plant growth. The background levels of nitrogen and phosphorus are low, as is typical of semi-arid regions, and not favorable for sustained agriculture. The opportunity for agriculture in the local environment would be severely limited even if conditions were marginally more humid at the time of occupation. Subsistence agriculture must have been along the San Juan River.

Nitrogen content was tested to assist in the determination of organic sources and characterization of features. Soil phosphorus was also examined since nitrogen is mobile in the soil matrix and subject to loss by denitrification and volatilization. Levels of nitrogen often increased with phosphorus but the magnitudes varied and resulted in a correlation coefficient of 0.6 (Table 6-8). This correlation, while significant at the .024 level, is not strong (accounting for only 36% of the variance). One sample (FA 1-6, FS 278) with relativly high nitrogen content may reflect fairly recent activity, since nitrogen is mobile and subject to loss in the soil. There was good correspondence between suspected hearths, dumps, and ash on the one hand, and increases in phosphorus on the other. Non-cultural areas showed a general background level of phosphorus of 1.7 ppm. (Fig. 6-29).

Table 6-8. Phosphorus and Nitrogen in Analyzed Samples.

FS	Phosphorus	Nitrogen
278	7.6	614
238	2.1	224
182	1.2	205
186	2.1	78
384	3.6	220
328	1.7	135
525	4.6	200
535	1.7	135
662	3.4	290
664	1.7	200
666	1.7	208
713	1.7	184
721	2.0	503
748	1.7	372

X-ray diffraction showed that mortar for the walls and floors of structures at FA 1-6 was not obtained from the two closest clay sources that were sampled, but instead at some further distance from the site (Table 6-9). Apparently the closest sources were unsuitable for building purposes.

Table 6-9. Constituents of Clay From Site Features and From Nearby Sources.

FS	Sample	Mont.	Mica	Verm.	Chlor.	Kaol.	Inter.	Other	Notes
336	Source	2	2	0	0	2	4	~	Mont.-Montmorillonite
341	SOURCE	3	2	2	0	2	0	Qtz (1)	Mica-Mica
362	Clay Nodules	4	2	0	0	2	0	Qtz (1) Fel (1)	Verm.-Vermiculite
394	Adobe	3	2	0	0	3	0	Qtz (1)	Chlo.-Chlorite
405	Adobe	4	2	0	0	3	0	Qtz (2)	Kaol.-Kaolin
432	Mortar	4	2	0	0	3	0	Qtz (2) Fel (1)	Inte.-Interstratified
433	Mortar	4	2	0	0	3	0	Qtz (2) Fel (2)	Qtz-Quartz
435	Morta	4	2	0	0	3	0	Qtz (2) Fel (1)	Fel-Feldspar
~	~	~	~	~	~	~	~	~	Values
~	~	~	~	~	~	~	~	~	Dominant--------Not Found
~	~	~	~	~	~	~	~	~	5 4 3 2 1 0

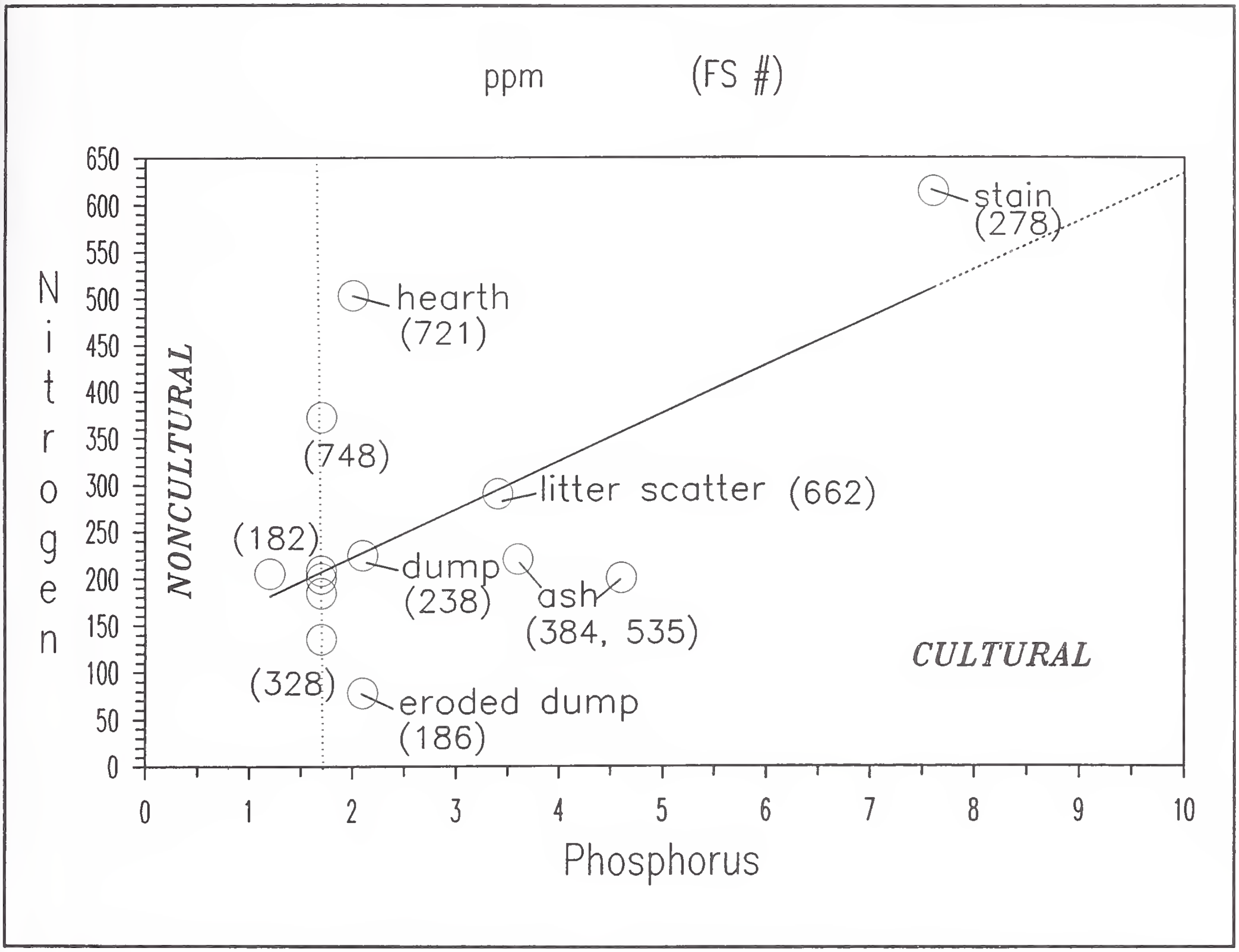


Figure 6-29. Levels of phosphorus in cultural and non-cultural soils from the Farmington project area.

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Chapter 7 • Excavation of FA 2-13 (LA 33741)

Jeanne A. Schutt

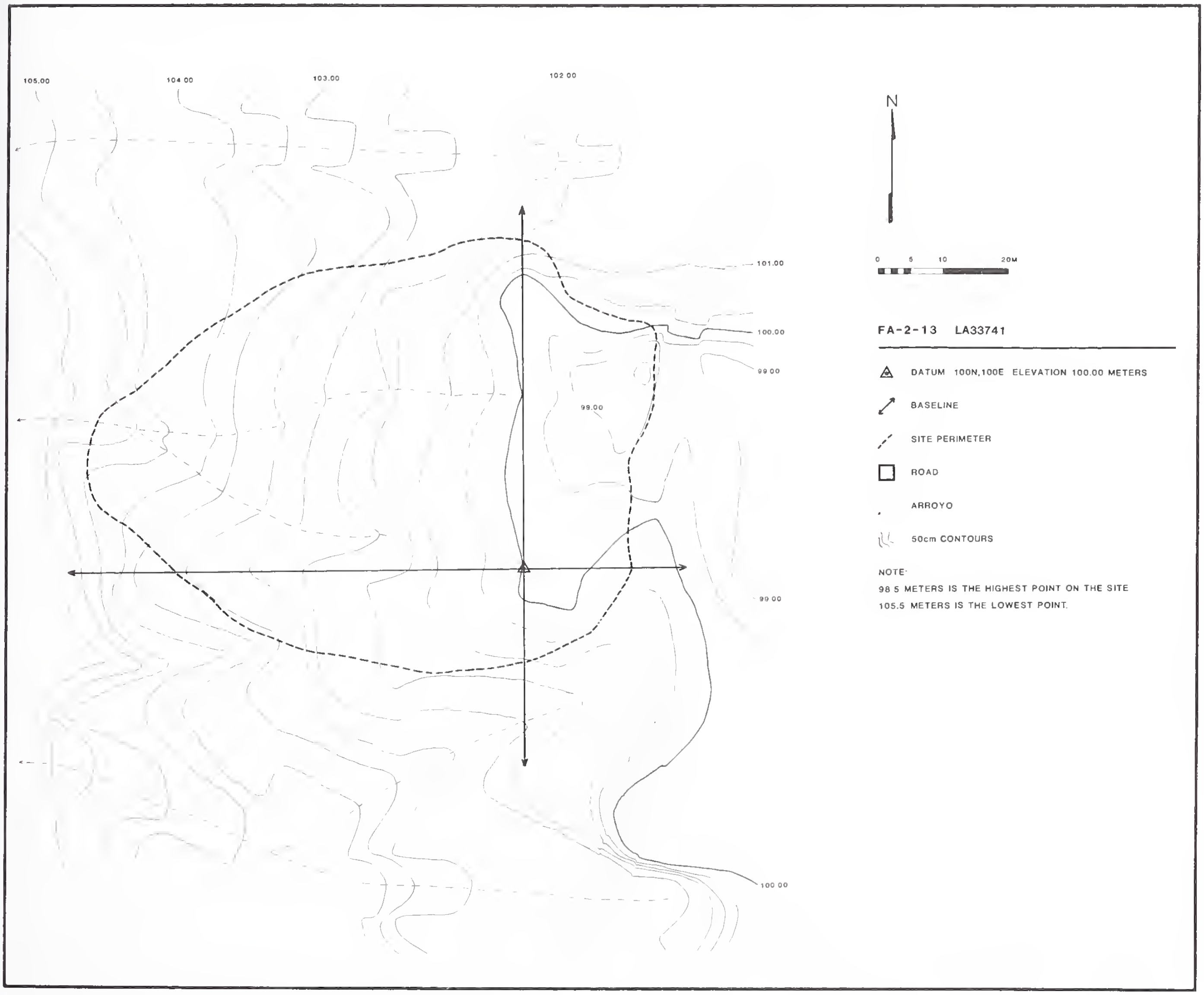
Introduction

FA 2-13 is one of four archeological sites within the Farmington portion of the Elena Gallegos Land Exchange that were selected for excavation. The site dates primarily to the Armijo Phase, with a possible later En Medio/Basketmaker II occupation. It is composed of a dense scatter of lithics, fire-cracked rock, bone, and groundstone, measuring approximately 65 m. north/south by 85 m. east/west. Three features, a hearth/roasting pit (Feature 1), a fire-cracked rock concentration (Feature 2), and a hearth (Feature 3) were identified.

Location and Setting

This Late Archaic/Basketmaker II site is located on the east side of the Farmington Glade Arroyo at an elevation of 5,600 ft. (1707 m.) (Map 1-1). It is situated on a stabilized dune, exhibiting considerable surface relief (Map 7-1), above the braided channels and wide flood plain of the Farmington Glade arroyo system, and below colluvial and talus slopes contained by sandstone cliffs (Figs. 7-1 and 7-2).

The valley floor and arroyo consist of course sand and gravel boulders. Terrace deposits are composed of silts and clays which are underlain by caliche. Sand dunes



Map 7-1. Outline and immediate topography of Site 2-13.

are presently stabilized by a sparse vegetation, and vertically-faced Ojo Alamo sandstone, of Paleocene age, flanks the outer margins of the drainage.

The wide variety of ecozones, resulting from a range of major landforms and water sources in close proximity to the site, offer considerable resource diversity (Fig. 7-2). Regional landforms range from mesas and rolling hills to plains, river bottoms, buttes, hogbacks, scarps, and mountains. Although no permanent water is available within the immediate site area, a number of permanent water sources occur within a 5 km. radius of the site. The La Plata River lies 2 km. to the west, Brown Spring is 4 km. to the north, the Animas River is 5 km. to the southeast, and the San Juan River is 5 km. to the south.

Vegetation patterns within the immediate site area offer considerable floral diversity (Fig. 7-2). Toll describes the broad range of floral resources that can be found within close proximity to the site (this volume). The sand dunes, as well as the mesas and the colluvial slopes to the east, provide pinyon-juniper/grassland communities while lower elevations to the west, across the arroyo system, offer scrub/grassland. Variations in soil type and drainage within these areas conditions the location of subsistence plants. Rabbitbrush, saltbush, and greasewood are common in the floodplain, while sage and narrowleaf yucca frequently occur on the higher, coarser soils. Ricegrass, dropseed, and stickleaf dominate on sandier soil at the margins of arroyos, while alkali sacaton, seepweed, mustards, and goosefoot are more common on finer sediments.

The mountains to the north provide conifers like ponderosa pine, douglas fir, and white fir. Higher elevations offer a range of faunal resources as well as berries, rushes and sedges not found in lower elevations (Toll, this volume).

The floral resources that were available to the inhabitants of FA 2-13 were useful in a wide range of subsistence activities (Table 7-1). Vegetation provided not only a variety of edible resources but also fuel, shelter, and materials to manufacture a wide range of necessary subsistence tools, such as cordage.

Faunal species that are found today, within the range of the prehistoric occupants of FA 2-13, are numerous. Common species include mule deer, cottontail, jackrabbit, and smaller rodents. Nearby faunal resources may have included antelope, black bear, bighorn sheep, elk, grizzly bear, and bison. Coyote, fox, raccoon, badger, bobcat, and mountain lion were also probably present. A variety of ducks, geese, cranes, quail, doves, turkeys, raptors, fish, and reptiles are also common. Faunal species provide food as well as materials to manufacture tools.

Finally, the tremendous variation in topographic relief and geomorphic processes represented in the area provide a range of lithic resources that can be used to manufacture a variety of lithic and ceramic subsistence tools. These lithic resources, for the most part, were locally available to the inhabitants of FA 2-13 (Schutt, this volume). A range of cobbles and boulders can be found in the Farmington Glade arroyo, and on both the colluvial and talus slopes to the east and west of the site. These cobbles include a variety of quartzites, metamorphic rocks, basalts, cherts, silicified woods, and chalcedony. Shales and clays are exposed below the sandstone cliffs and at the base of mesas where the colluvial deposits have been eroded.

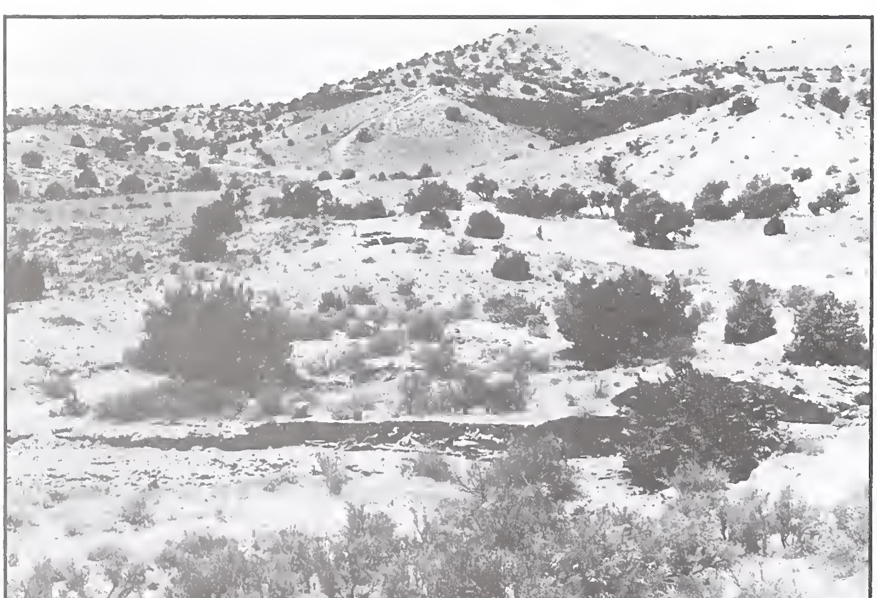


Figure 7-1. Vicinity of Site FA 2-13.

Testing and Excavation Methods

FA 2-13 was first examined during the initial inventory survey in November of 1981. The site was described as a dense lithic scatter with two to five pithouses or semi-subterranean features, dating to the Archaic. During the testing phase in April of 1982, a series of shovel tests, auger holes, and grid units were excavated to assess subsurface deposits. Shovel tests were placed at five m. inter-

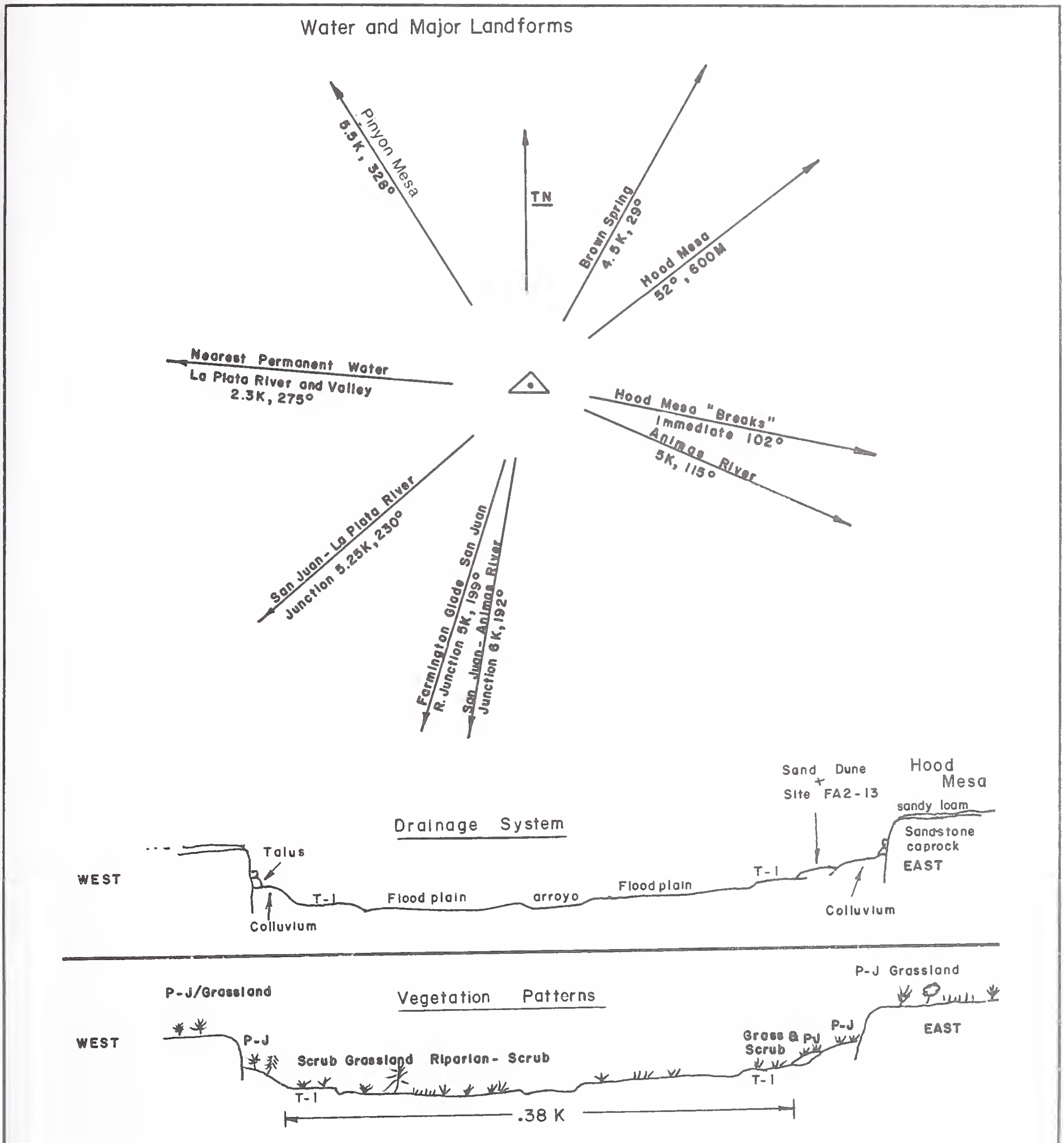
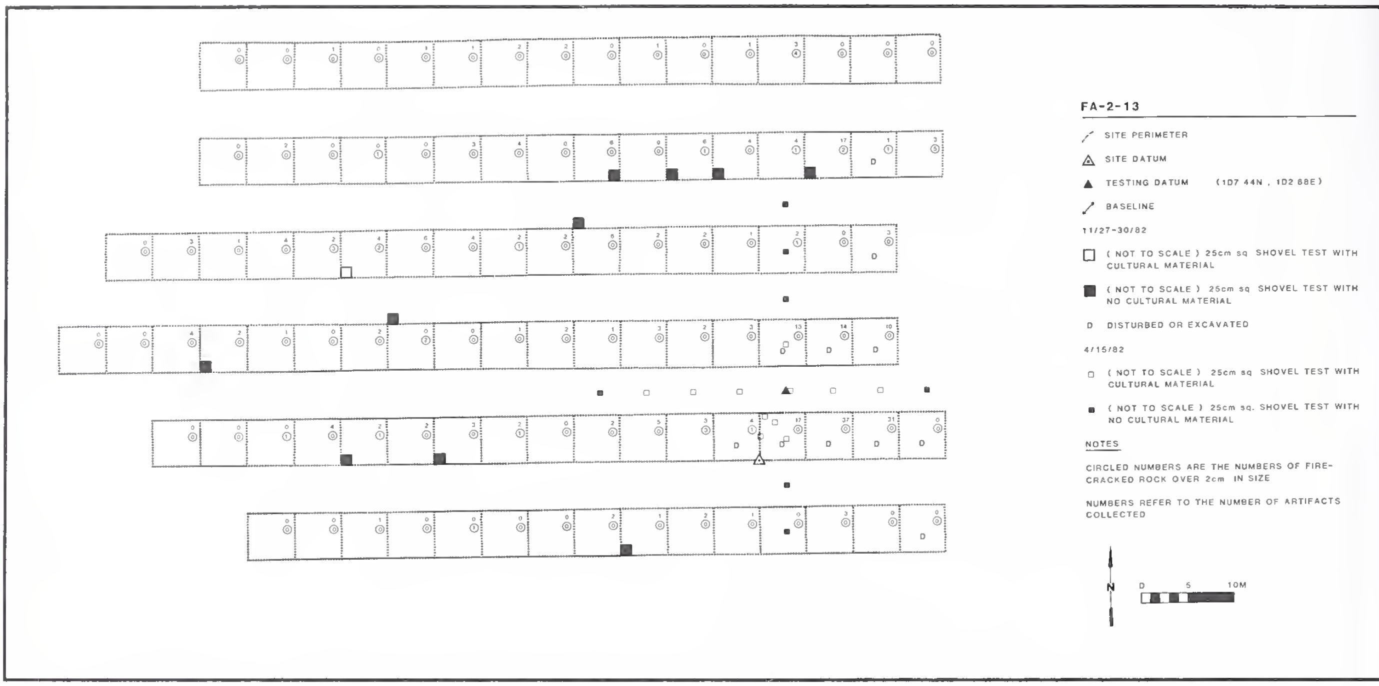


Figure 7-2. Local environment of FA 2-13.



Map 7-2. Site FA 2-13. Testing units and surface collection transects.

Table 7-1. Resources Provided by Locally-Available Plants.

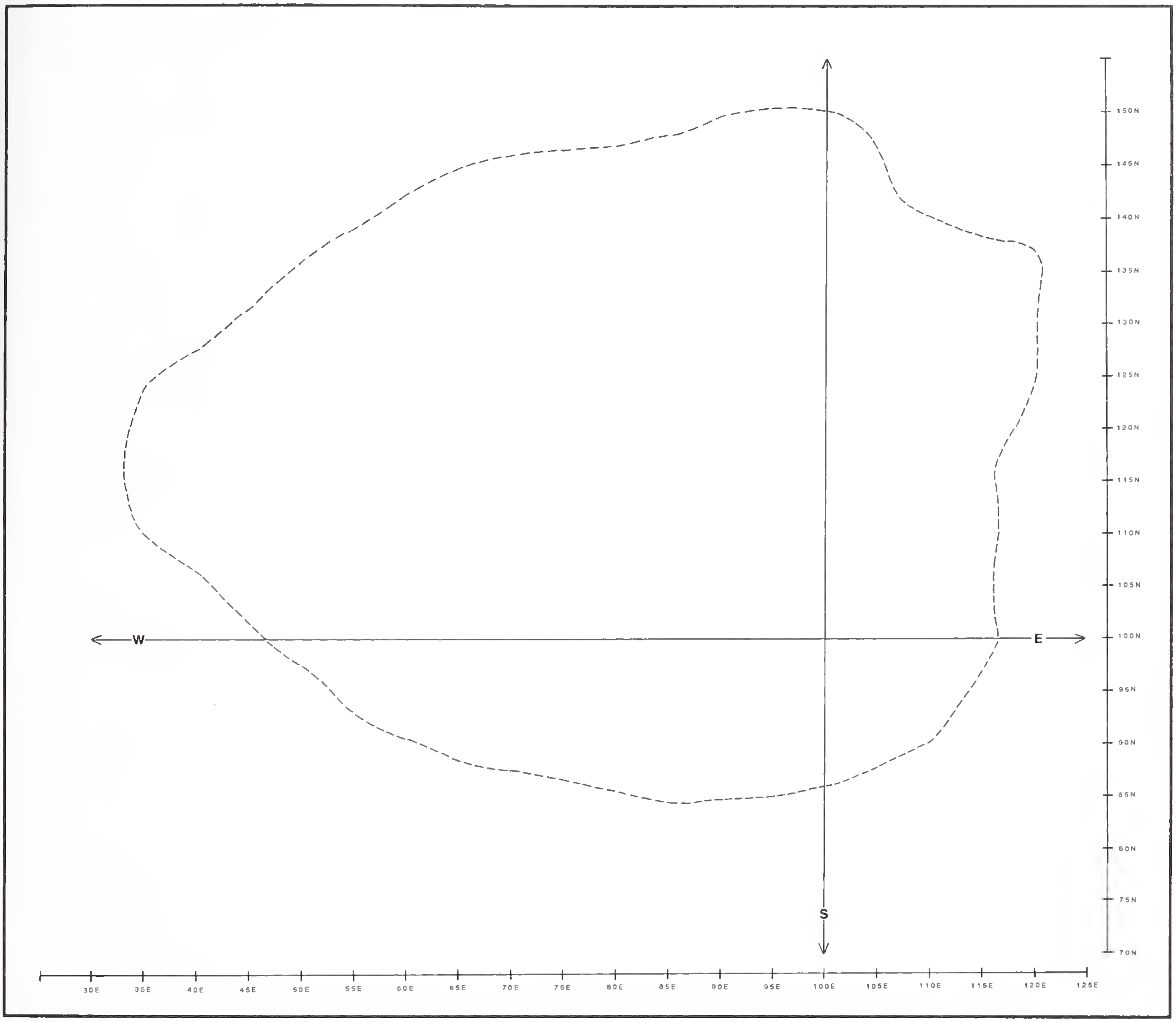
Plant	Food	Fuel	Shelter	Cordage	Tools
	Resources				
Juniper	X	X	X	X	X
Pinyon	X	X	X		X
Greasewood		X	X		X
Saltbush	X	X	X		X
Rabbitbush	X	X	X		
Sage	X	X	X		
Yucca	X			X	
Grasses	X				

vals along a north/south and east/west axis through the site (Map 7-2), and five tests were placed in and around a possible pitstructure. Lithic materials were recovered from over half of the shovel tests. Shovel tests in the depression also produced a number of lithic artifacts. The testing indicated that there were substantial subsurface deposits.

Three 1 m. x 1 m. test units were excavated during the testing phase to identify site stratigraphy and assess subsurface deposits. These units were excavated in the area of the northern artifact scatter, and near the depression and staining in the main site area (Units 1, 2 and 3). Surface artifacts were mapped and the units were excavated in 10 cm levels. All soils were screened. The results of these excavations are presented in the site element discussion.

The test excavations that were carried out at FA 2-13 indicated that the site held buried deposits. In the fall of 1982 formal excavations began. A north/south and east/west baseline was established through the site, with datum at 100N/100E (Map 7-3). All excavations were tied into this grid system. A surface collection was made from transects covering 50% of the of the site (Map 7-2). This sample was used to assess variation in the surface assemblage, and to identify areas for excavation. A series of excavation units was established to define the features on the site. The site was examined as three spatially discrete areas: the Main Site area, the Northeast area, and the Northernmost area. Features 1 (hearth/roasting pit) and 2 (fire-cracked rock scatter) occurred in the central portion of the main site area. Feature 3 (hearth) was located in the northern portion of the main site area.

A series of shovel cuts was placed south and west of Unit 2, and north and east of Unit 3, to assess the extent of Features 2 and 3. These shovel tests defined the rough limits of Features 2 and 3.



Map 7-3. Site FA 2-13, excavation grid and site perimeter.

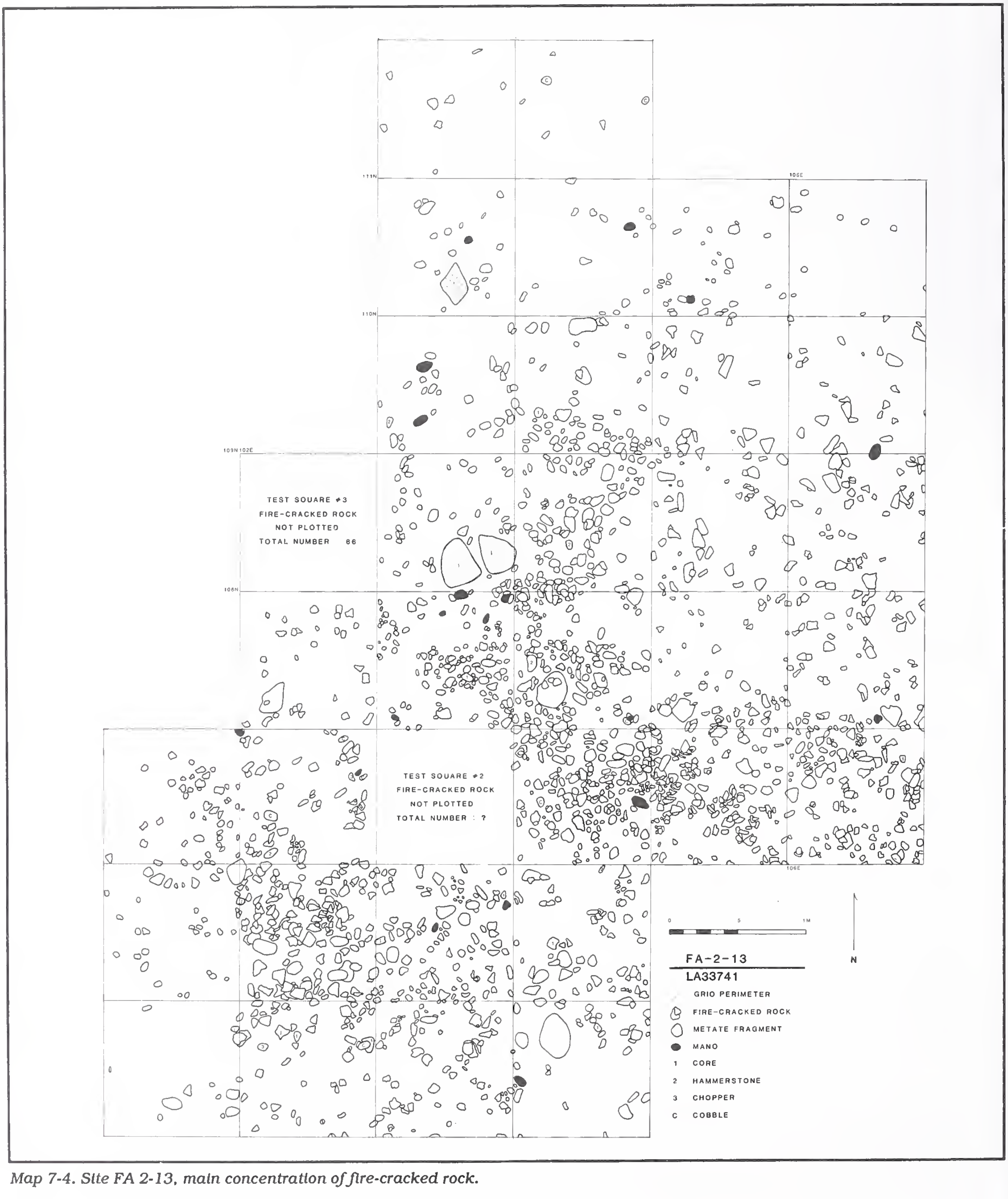
Thirty-five additional grid units were excavated on FA 2-13 during the process of identifying the occupational history of the site and the extent of features on it. The majority of these (33 units) was concentrated in the main site area. Two additional grid units were placed in the northeastern portion of the site (Units 36 and 37).

Site Elements

FA 2-13 was composed of a dense concentration of fire-cracked rock and lithic debris in the Main Site Area, a sparse Northeastern Area, and a Northernmost sparse scatter. Three features were identified in the Main Site Area. The majority of excavations were concentrated in the Main Site Area to identify the extent of features and occupational history. These areas are briefly described below.

Main Site Area (Provenience 1)

The main site area exhibited on the surface a dense concentration of fire-cracked rock and lithic debris (Map



Map 7-4. Site FA 2-13, main concentration of fire-cracked rock.

Figure 7-3. Site FA 2-13, Feature 2.

7-4). A total of 34 grid units was excavated in this area. Units 2 and 3 were excavated during the testing phase and are presented here to describe the stratigraphy in this portion of the site.

Test Units

Unit 2 (106N/103E) • Unit 2 was placed in a dense lithic scatter in the central portion of the main site area to the southwest of Feature 2. This feature consisted of a fire-cracked rock concentration with some bone. Unit 2 was excavated to 80 cm. below the surface. A charcoal stain was identified at the base of Level 2 extending to the bottom of the unit. The stain appeared as mottled and rodent-disturbed. Sparse charcoal flecks were identified throughout. Abundant artifacts including lithics, bone, and fire-cracked rock were recovered from the upper levels (Levels 1-5) and decreased in number with depth. Cultural materials were found in all levels.

An auger was used to test below Level 9. Two auger tests extended to 1.30 m. below this level. One was placed near the east wall of the unit (Auger #1) and the other in the center of the unit (Auger #2). One piece of bone, a flake and a piece of charcoal were recovered from Auger #1, although no staining was evident. No staining or cultural materials were identified in Auger #2.

Unit 3 (101N/102E) • Unit 3 was also placed in the densest artifact distribution in the main site area to the west of Feature 1 (hearth/roasting pit). The unit was excavated to one meter below surface. Again, a charcoal stained mottling was identified in Level 2 but faded toward the bottom of the unit. Sparse charcoal flecks were found throughout the stain. Abundant artifacts were recovered from the first seven levels. Level 9 lacked artifacts, while Level 10 exhibited three lithic items and one piece of bone.

An auger was used to test below Level 10. The auger test extended an additional 1.55 m below the level. Although no staining was identified, three flakes were recovered.

Features

Three features were identified. Feature 2 was identified on the surface and consisted of a concentration of fire-cracked rock and lithic debris. Feature 1, a hearth with an associated fire-cracked rock concentration, was found below the surface scatter. Feature 3, a hearth, occurred in the northern portion of the Main Site area. These features are described below.

Feature 2 (Fire-cracked Rock Concentration) • Feature 2 was initially identified on the surface in the central portion of the main site area. It was observed as a dense concentration of fire-cracked rock and artifacts. Excavations through Level 1 in six grid units determined that the feature measured 2.50 m. north/south by 2.00 m. east/west, and that it was roughly 10 cm. thick (Fig. 7-3). Six burned sandstone slabs were also recovered. Bone, lithics, and groundstone were present.

Feature 1 (Hearth/Roasting Pit) • Feature 1 was identified immediately below Feature 2, at the top of Level 3 (see Fig. 7-4). Although it exhibited considerable rodent disturbance, the feature measured approximately 70 cm. in diameter with a depth of between 10 and 15 cm. The feature's boundaries were vague and poorly defined. Fill consisted of a dark charcoal-stained matrix with fire-cracked rock, bone, and a few lithics.

Feature 3 (Hearth) • Feature 3 was identified in Level 3 as an amorphous, circular, charcoal-stained pit (Fig. 7-5). In Level 4 it became better defined, and appeared to be the bottom of a circular fire hearth. The hearth measured 42 cm. north/south by 49 cm. east/west, and was approximately 8 cm. deep. The fill consisted of a very concentrated, charcoal-stained organic matrix. A light scatter of fire-cracked rock, burned bone, and lithic debris occurred in the immediate area. A fire-cracked rock concentration (Feature 2) occurred 2 meters to the south.

It appears that Features 1 and 3 represent the same occupational episode. Both occurred at the top of Level 3. Feature 2, however, occurred above Feature 1, suggesting a later activity episode.

Northeastern Area (Provenience 2)

Provenience 2 represents a sparse surface lithic scatter in the northeastern portion of the site. Two 1 m. x 1 m. units (36 and 37) were excavated in this area. Both units were excavated one level only, and both lithics and fire-cracked rock were identified. One quadrant of Unit 37 was excavated to caliche at 32 cm. below surface. A few large lithics were plotted in place within Level 1 of Unit 37. An additional 386 flakes were found in 1/8"-mesh screening done at the laboratory because wet conditions at the site, due to snow, prevented proper screening. These data suggest that considerable subsurface deposits occur in this area.

Northernmost Area (Provenience 4)

Provenience 4 was identified on the surface as a sparse lithic and fire-cracked scatter that occurred on the most elevated portion of the site. A single unit (no. 1) was excavated in this area during the testing phase to assess the potential for buried deposits. The results of these excavations are presented below.

Unit 1 (130N/112E) • This test unit was placed in a sparse surface artifact distribution. All soils were screened through 1/8" mesh. Two lithic artifacts and 41 pieces of fire-cracked rock were recovered from the upper 10 cm. (Level 1) of the unit. The fire-cracked rock cobbles exhibited diameters of 3 to 4 cm. No artifacts were recovered below this level. Level 1 was composed of sand matrix and underlaid by hard clay caliche. The unit was excavated 30 cm. into this sterile strata.

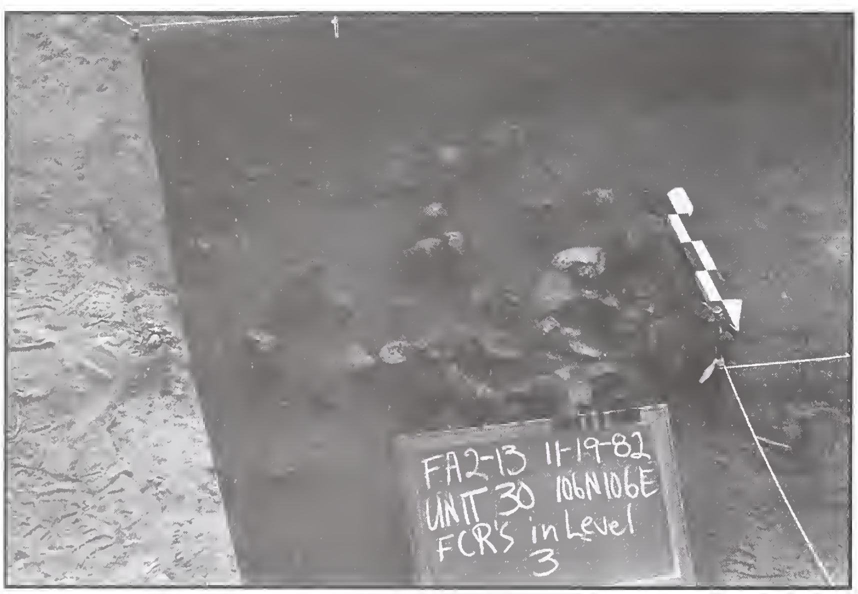


Figure 7-4. Site FA 2-13, example of layer of fire-cracked rock and artifacts.

Site Stratigraphy and Occupational History

The excavations carried out at FA 2-13 identified three depositional units that relate to the overall site formation and occupation (Figs. 7-6 and 7-7). The uppermost level consists of a combination of aeolian and colluvial deposits in which the upper 10 cm. contain organic debris. This deposit is approximately 30 to 35 cm. thick in the central portion of the site. The occupation zone appears to occur in the lower 25% of this stratum, and probably consists of one continuous cultural component, or else repeated occupations over a short time span. This occupational level is easily identified as a horizontal concentration of fire-cracked rock, lithic debris, and charcoal staining. The materials below Unit 1 do not appear to represent an earlier occupation. It seems that bioturbation resulting from post-occupational rodent disturbance has moved cultural material below the occupational level in the sand dune.

The second geological stratum represents aeolian deposition that resulted from dune formation. This stratum contains some artifacts and minimal staining, which is most likely the result of rodent activity. Charcoal staining from features in the upper stratum could be traced down rodent burrows to the lower stratum.

The third stratigraphic unit occurs approximately 1.96 m. below the surface. This stratum is characterized by an orange-tan silt and was identified in auger tests in Units 1, 2, and 3 during the testing phase. No cultural materials occurred in this stratigraphic unit.

Information gained from geomorphologys suggest that the site was occupied for either one continuous period or repeated occupations over a short time span. The fact that Feature 2 is superimposed over Feature 1 would appear to indicate that there were two occupations.

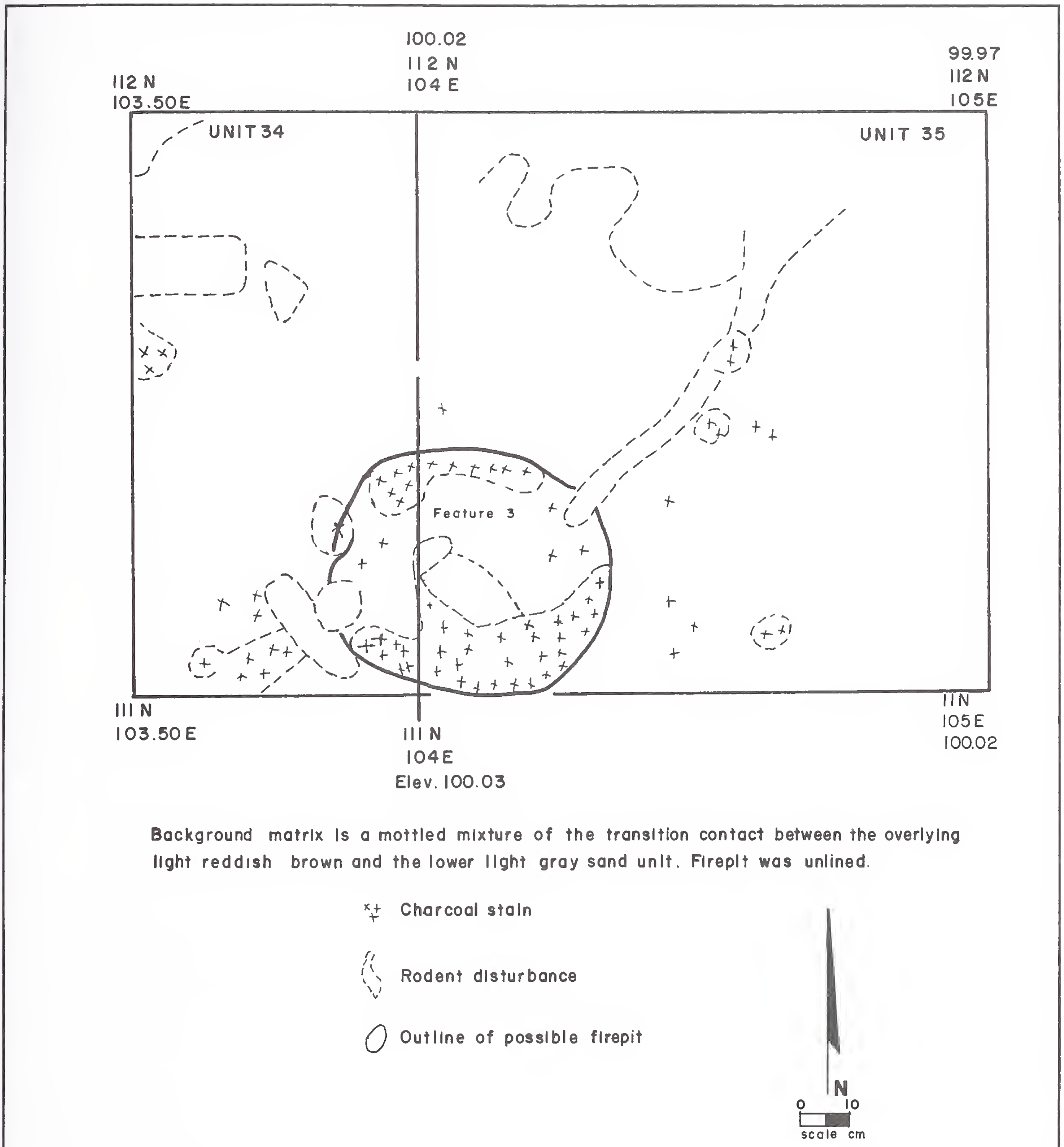


Figure 7-5. Site FA 2-13, Feature 3.

Site Dating

Several methods were employed to date FA 2-13. All indicate an occupation in the Armijo Phase of the Archaic, or possibly as late as early En Medio/ Basketmaker II. Two radiocarbon dates were obtained: 3310 ± 100 B.P. (TX-4779), which yields a corrected date of 1638 B.C. ± 238 (95% confidence interval); and 2410 ± 80 B.P. (DIC-3002), which yields a corrected date of 525 B.C. ± 260 (Klein et al.1982). Five thermoluminescence samples were analyzed by Ralph Rowlett at the University of Missouri. These range in date from 3100 ± 400 to 2650 ± 400 B.P. Mr. Rowlett believes that a determination of 2833 ± 300 B.P. is the best date.

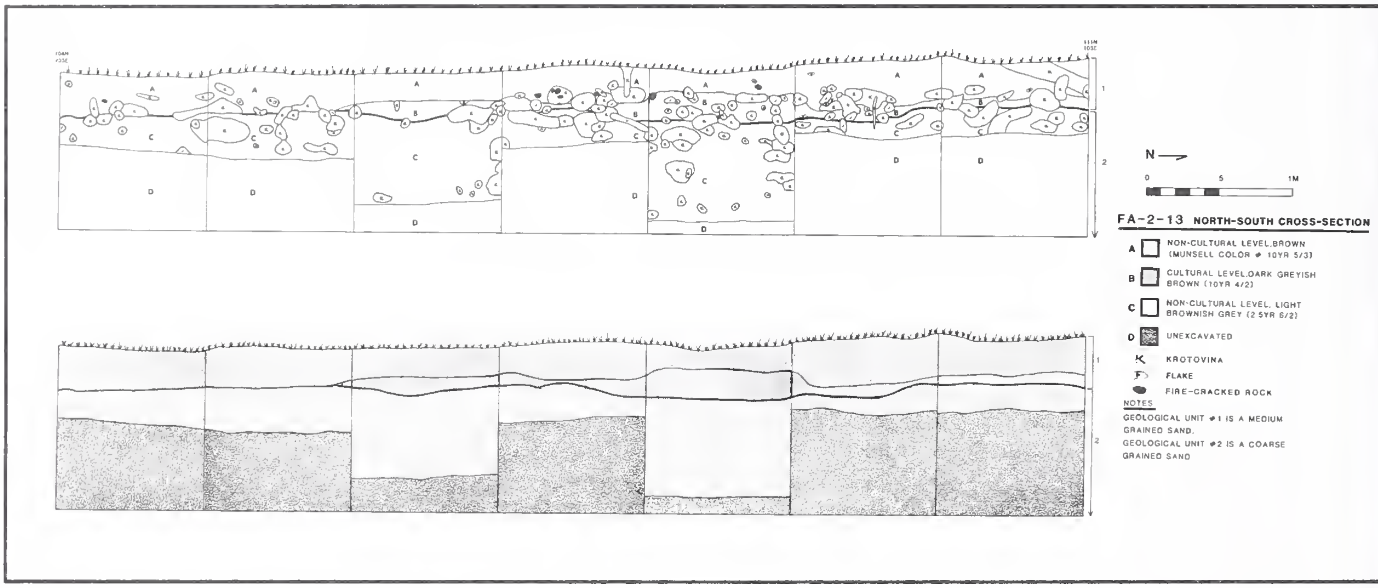


Figure 7-6. Site FA 2-13, north-south cross section.

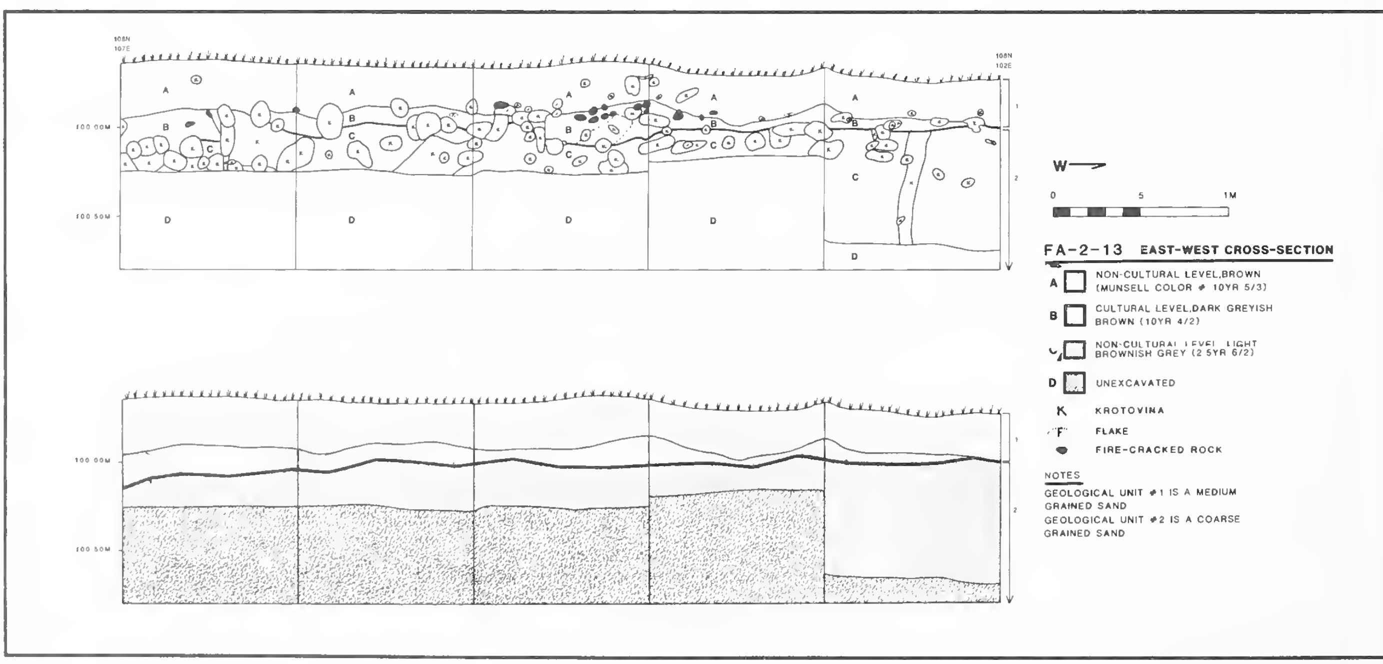


Figure 7-7. Site FA 2-13, east-west cross-section.

Projectile points include late Archaic Armijo phase types as well as an Anasazi type. Given these results this site is assumed to represent primarily the Armijo phase, with possibly an En Medio/Basketmaker II occupation.

Lithic Analysis

This section will discuss the lithic artifacts that were recovered from the site. These data will be used to further determine occupational history and site function at FA 2-13.

A total of 17,942 chipped stone artifacts and 100 groundstone artifacts was recovered from the site. These include a wide range of artifact types: 16,809 flakes, 473 pieces of small angular debris, 1 piece of large angular debris, 21 retouched flakes, 1 retouched piece of small angular debris, 57 projectile points, 136 bifaces, 1 uniface, 31 scrapers, 5 denticulates, 1 chisel, 6 perforators, 5 drills, 8 preforms, 87 cores, 10 hammerstones, 5 choppers, 2 hammerstone/choppers, 2 ground hammerstones, 35 bipolar flakes, 239 fire spalls, 2 anvils and eight non-cultural items.

Material type diversity is also high, with 24 materials represented in the lithic assemblage, and an additional four material types represented by only groundstone. With the exception of 21 other igneous items, all the materials are local. The most common material types are yellow silicified wood (25.1%, 4374 items), San Juan fossiliferous chert (20.3%, 3528 items), Morrison light chert (18.3%, 3178 items) and concoidal silicified wood (17.3%, 3019 items). The remaining 19% of the assemblage is split between 20 different material types.

Three broad areas of the site have been defined, and six analytical proveniences have been defined within these areas. The main site area is the largest and most dense. The surface assemblage within this area is defined as Provenience 1. Auger tests in the main site area are defined as Provenience 3, and the subsurface excavations are defined as Provenience 5. The surface assemblage from the small subsite area to the northeast is Provenience 2, and the subsurface assemblage from this area is Provenience 6. The northernmost test area is discussed as a single assemblage (Provenience 4) due to low artifact counts.

Main Site Area

Provenience 1 • Provenience 1 consists of the surface collection within the main site area. A total of 438 lithic artifacts was recovered from the surface in this provenience. These are 410 flakes, 1 bipolar flake, 7 pieces of small angular debris, 5 bifaces, 2 scrapers, 7 cores, 1 hammerstone, 1 hammerstone/chopper, 2 fire spalls, and 2 anvils.

The most common material types represented parallel the site as a whole, with San Juan fossiliferous chert (26.0%, 104 items), Morrison light chert (19.2%, 77 items), and yellow silicified wood (16.7%, 67 items) being well represented. Conchoidal wood, however, is under-represented compared to the site as a whole, occurring almost exclusively in the subsurface assemblage from this area. The remaining artifacts are split among 15 material types.

Examination of percentages of dorsal cortex on flakes suggests that later stages of reduction were emphasized in this area of the site. Of the 373 flakes with the dorsal cortex, 84% (317 artifacts) exhibited no cortex on their dorsal surface. Every raw material type represented by flakes in Provenience 1 exhibited a majority that lacked any dorsal cortex. Limited cortex was noted on 9 of the 17 raw material types in this group, suggesting that some limited decortication may have occurred.

Examination of core data supports this suggestion. Only seven cores (less than two percent of the Provenience 1 assemblage) were recovered from the surface of the main site area. Almost half of these (42%) are tested cores of San Juan fossiliferous chert (two cores) or quartzite (one core). The remaining cores are multiplatform (one splinter wood core and one quartzite core), single platform (one quartzite core), or bifacial (one quartzite core). The relatively high frequency of tested cores suggests that some material selection and decortication occurred, as indicated by the dorsal cortex data. However, the low relative frequency of cores to flakes along with the relatively high frequency of flakes without dorsal cortex suggests that secondary and tertiary reduction were emphasized.

Platform data also support this conclusion. Only 12 (7%) of the 161 recorded flake platforms were cortical, while 50 (31%) appeared prepared. These prepared platforms exhibited grinding (37, 22%) and retouch (13, 8%). Higher frequencies of prepared platforms are generally associated with bifacial reduction, and retouched platforms in particular can be expected to occur as a result of formal tool manufacture.

Retouched platforms of five different material types were observed in the surface assemblage of the main site area. These materials are San Juan fossiliferous chert (five retouched platforms), yellow silicified wood (four retouched platforms), Morrison light chert (two retouched platforms), Morrison tan chert (one retouched platform), and high surface gravel (one retouched platform). This suggests that formal tools, from each of these materials, were manufactured at the location. It should be noted, however, that much higher frequencies of retouched platforms (of 18 different materials) were recovered below the surface in this area. This indicates that formal tool manufacture, using a much wider variety of raw materials, was more heavily emphasized than initially apparent in the surface assemblage (see Provenience 5 for more information).

Tool manufacture is also suggested by the tools present in this assemblage. Retouched tools include five bifaces, two unifaces, two anvils, one hammerstone/chopper, one hammerstone, and one core/hammerstone. Both of the unifaces and one of the bifaces were classified as functionally incomplete, suggesting that these items may have been discarded as a result of manufacturing errors, rather than use. The remaining four bifaces have undetermined functional completeness.

Three facially retouched tools exhibited evidence of heat treatment. Two unifaces (functionally incomplete) were manufactured of silicified wood and one biface (indeterminate functional completeness) was manufactured of San Juan fossiliferous chert. All three tools appeared to have been heat-treated successfully, although two of them appeared to be manufacturing failures. The surface assemblage is not representative of the high frequencies of tools recovered from excavations in this area (summarized as Provenience 5).

Evidence for tool use from the surface of the main site area is limited to 11 utilized flakes (2.5% of the Provenience 1 assemblage). All but two of these exhibit unidirectional use wear on at least one of their edges. Six flakes exhibited unidirectional scars, and four exhibited unidirectional scars and rounding. Two flakes exhibited bidirectional scars. This suggests that both cutting and scraping activities occurred at this location. Again, the limited number of tools found on the surface does not reflect the variety or frequency observed in the subsurface assemblage.

In sum, the surface assemblage of the main site area (Provenience 1) suggests an emphasis on later stages of reduction, especially formal tool manufacture. Evidence of tool use is limited to utilized flake tools, but suggests that both cutting and scraping occurred. Although discarded formal tools are present, it is unclear if these tools represent manufacturing failures or tools discarded after use.

The surface assemblage does not reflect the same frequency or diversity of lithic items as displayed in the subsurface assemblage of this same area (Provenience 5). This pattern has been observed in other dune situations, where smaller items can be expected to be more frequent below the surface as a result of geomorphological size sorting (Schutt 1988: 7-26; Wandsnider 1985: 6). It is interesting to note, however, that no larger groundstone fragments were recorded on the surface although numerous pieces of groundstone were recovered from excavations. This suggests that although the surface assemblage is not representative of the site, geomorphological size-sorting was not entirely responsible.

Provenience 3 • This assemblage consists of the 167 lithic artifacts recovered as a result of auger tests in the main site area. These artifacts include 161 flakes, 3 pieces of small angular debris, 2 projectile points (indeterminate type), and 1 biface.

Material diversity is similar to the rest of the assemblage from the main site area, with yellow silicified wood (28%, 37 artifacts), San Juan fossiliferous chert (12%, 16 artifacts), and Morrison light chert (27%, 36 artifacts) being the most frequent materials. The remaining artifacts were manufactured of eleven different materials, all locally available.

Reduction technology, as reflected by percentages of dorsal cortex present, indicate that later stages of reduction were emphasized, and only very limited decortication occurred. Of the 128 flakes with dorsal cortex recorded, 119 (92%) lacked any dorsal cortex at all, while cortex was observed on 7 of the 14 material types occurring in small numbers.

Platform data for flakes recovered from auger holes also support this conclusion. None of these flakes exhibits cortical platforms. Formal tool manufacture is suggested by nine (16%) retouched platforms of four different material types (yellow wood, other fossiliferous chert, Morrison mottled chert, Morrison light chert). Ground platforms (four [seven percent]) are also present.

Evidence of tool use is limited to one utilized flake manufactured of high surface gravel. The flake exhibits unidirectional scars on a lateral edge, suggesting use in scraping.

Provenience 5 • All lithic artifacts recovered from excavations in the main site area are grouped into Provenience 5. This provenience includes the vast majority of artifacts recovered from FA 2-13.

A total of 16,964 lithic artifacts and 98 pieces of groundstone was recovered from excavations in the main site area. These include 15,913 flakes, 19 retouched flakes, 15 bipolar flakes, 1 retouched piece of small angular debris, 426 pieces of small angular debris, 1 piece of large angular debris, 8 preforms, 68 cores, 2 hammerstone/groundstone items, 1 hammerstone/chopper, 9 hammerstones, 236 fire spalls, and 5 items which turned out to be non-cultural. Formal tools include 55 projectile points, 127 bifaces, 1 uniface, 1 chisel, 6 perforators, 5 drills, 4 choppers, 29 scrapers, and 5 denticulates. Groundstone artifacts include fragments of a variety of grinding implements.

As might be expected of so large an assemblage, material types reflect the material diversity for the site as a whole, and are generally like the surface assemblage in this area (Provenience 1). The majority of the lithic assemblage was manufactured of 3 local material types, with 21 additional types represented. With the exception of 21 items manufactured of other igneous material, all of these are locally-occurring. Yellow wood (23.6%, 3892 items), San Juan fossiliferous chert (20.6%, 3395 items) and Morrison light chert (18.6%, 3065 items) are well represented, as they are in the surface assemblage. Conchoidal wood, however, is over-represented compared to the surface assemblage (18.1% of the excavation sample; 6.3% of the surface sample).

Examination of dorsal cortex on flakes suggests that very little decortication occurred in the main site area, and that reduction strongly emphasized later stages of reduction and tool manufacture. Of the 15,434 flakes examined for dorsal cortex, 92% (14,270 flakes) lacked any cortex on their dorsal side. This is a very high frequency of flakes with no dorsal cortex, and is even higher than that exhibited by the surface assemblage (84%). Some cortex is recorded on 19 of the 22 materials represented, indicating that some decortication occurred on the majority of materials, but was limited in degree.

Examination of core data from Provenience 5 supports the interpretation that some decortication occurred, although an emphasis on later stages of reduction is indicated. Numerous core types are represented: multiplatform regular cores (27, 39%), multiplatform exhausted cores (9, 13%), single platform regular cores (3, 4%), single platform exhausted cores (2, 2%), bifacial regular cores (14, 20%), bifacial exhausted cores (3, 4%), and tested cores (13, 19%). Eight material types are represented by tested cores, suggesting that material selection for these locally-occurring materials took place on FA 2-13. These materials are yellow wood, splinter wood, San Juan fossiliferous chert, other fossiliferous chert, Morrison mottled chert, high surface gravels, moss jasper, and quartzite. The variety of core types that is present in this assemblage suggest that a wide variety of reduction techniques was carried out. This variety further indicates that material selection, core reduction, and formal tool manufacture occurred at the site.

Platform data supports both these findings. Cortical platforms, indicating decortication, comprise only 2% (212 platforms) of the flakes with platforms. This suggests that limited decortication occurred. Prepared platforms (ground or retouched), indicating later stages of reduction, usually tool manufacture, are very well represented (43%, 3,418 platforms).

Retouched platforms comprised 7% (528 platforms) of the prepared platforms. Numerous raw materials are represented among flakes with retouched platforms (18 total), suggesting that a wide range of raw materials were used to manufacture formal tools. Raw materials that were used for formal tool manufacture include yellow wood, conchoidal wood, splinter wood, palm wood, San Juan fossiliferous chert, high surface fossiliferous chert, other fossiliferous chert, Morrison mottled chert, Morrison light chert, Morrison tan chert, Morrison grey chert, Brushy Basin chert, high surface chert, moss jasper, banded chalcedony, other igneous (non-local), quartzite, and high surface quartzitic sandstone. Formal tools from the vast majority of these material types are also represented in this assemblage, suggesting that formal tools may have been manufactured, used, and discarded at this location.

It should be noted that seven of the retouched platforms exhibited use-wear on their platform-dorsal edges. This suggests that tools were resharpened at the location. Maintenance activities of this type can be expected to occur as a result of tool use, or at a base camp. Only two material types are represented by utilized retouched platforms. They are conchoidal wood (five), and Morrison light chert (two). These data indicate that at least two tools were resharpened at this location.

Evidence for tool use includes both discarded tools themselves, and use-wear on both retouched and unmodified edges. The assemblage from Provenience 5 includes a wide variety of tool types and numerous edges with utilization. These formal and expedient tools are summarized below.

The formal tool assemblage that was recovered from Provenience 5 is characterized by considerable artifact-type variety and relatively high formal tool frequencies. Nine different types of formal tools were represented by the 233 formal tools. Bifaces are by far the most common formal tool type, with 127 bifaces represented. Next in frequency are 55 projectile points, followed by 29 scrapers. Denticulates, drills, perforators, choppers, and a chisel (or wedge) were also recovered.

Bifaces are associated with a number of activities, and many formal tool types are manufactured through bifacial reduction techniques. At this provenience, the majority of the bifaces (56%) are recorded as functionally incomplete. This suggests that many of the bifaces represented may be manufacturing failures. However, twenty-two percent of bifaces are recorded as functionally complete, and three of these exhibited use-wear along a retouched edge. Two bifaces exhibited bidirectional use wear, and one biface exhibited unidirectional hard wear. This suggests that bifaces were not only manufactured at this location, but that several may have been discarded after use. Wear patterns indicate utilization in both cutting and scrapping activities.

Projectile points indicate that hunting was an important component of the subsistence activities at FA 2-13. Both the high frequency of projectile points and the roughly 12,000 bone fragments (Bertram, this volume) support this suggestion.

Of the 55 projectile points identified, information on projectile point type is available for only 14. The majority of these (12) are classified as late Archaic. One each is classified as Armijo phase and as Anasazi. In addition, four projectile points are recorded as reworked. This suggests that this site may have been revisited one or more times from the late Archaic through Anasazi time periods.

Scrapers and unifaces are also frequent in this assemblage (29 scrapers and 1 uniface). Examination of functional completeness suggests that unifaces and scrapers have been discarded both as a result of errors in manufacturing (functionally incomplete), and as a result of utilization (functionally complete). Three unifaces also exhibited use wear. All three of these exhibited unidirectional hard wear, indicating that these tools were used to scrape on hard surfaces like bone or wood (Schutt 1982).

Additional evidence of tool utilization is limited among the formal tools, although numerous unmodified edges were utilized. Only one additional formal tool exhibited utilization. This was a drill with rotary wear on its tip. An additional 338 expedient tools exhibited utilization on one or more edges. Thirteen of these are marginally retouched flakes, and 325 are unmodified flakes with use-wear. Of the retouched tools, the majority (9, 69%) exhibit unidirectional use-wear, indicating scraping. Three tools (23%) exhibited bidirectional use-wear, indicating cutting. A retouched tool exhibited one edge with unidirectional use-wear and one edge with bidirectional use-wear. The unmodified flakes also exhibited a higher proportion of unidirectional wear patterns (264, 81%). Only 61 unmodified flakes (19%) exhibited bidirectional use-wear indicating cutting. This suggests that activities involving scraping may have been emphasized at this location, at least among those activities likely to produce wear patterns.

Also of interest to the functional interpretation of this location is the high frequency of grinding implements. Examination of the 98 fragments of groundstone, to assess the minimum number of grinding implements, indicates that numerous grinding implements of various types were used at this location. At least ten one-hand manos, eight indeterminate manos, three two-hand manos, two slab metates, four unknown metates, two trough metates, one grinding slab, one other groundstone item, and one indeterminate ground and grooved item were recovered. These estimates of minimum numbers of grinding implements (MNGI) are based on the evaluation of artifact type, material type, grain size, and number of grinding surfaces. This suggests that grinding played an important role in subsistence at this site. Scott Cummings (this volume) suggests that cheno-am seeds, sagebrush seeds, and juniper berries were probably ground on at least two of these metates.

In summary, Provenience 5 displays a wide variety of expedient and formal artifact types which suggest that numerous activities occurred at this location. Activities relating to tool manufacture, maintenance, and use are represented. Reduction information indicates that later stages of reduction, specifically tool manufacture, were emphasized. Some decortication of local materials also occurred. Tool maintenance is represented by several resharpening flakes, and use of tools for cutting, drilling, and scraping is indicated. Use-wear data suggest that scraping may have been emphasized, at least as reflected by wear patterns. Variety in the tool types themselves suggests that hunting and plant processing played an important roll in the subsistence activities at this location. In addition, numerous tools generally believed to be used to make other tools, such as drills, perforators, and a wedge, are present in the assemblage.

Northeast Area

Provenience 2 • Provenience 2 is the surface assemblage from a small portion of the site to the northeast of the main site area. Subsurface remains in this area are summarized as Provenience 6.

A total of 13 lithic artifacts was recovered from Provenience 2. Although no groundstone was recovered from the surface, two pieces were recovered from subsurface testing. Of the 13 lithic artifact, the majority (11, 84%) were flakes. One biface was also recovered along with one multiplatform exhausted core.

There are only four material types represented on the surface of this provenience. The majority of the assemblage is yellow silicified wood (72.7%, 8 items). The other three materials are represented by 1 item each.

Reduction information is limited by the small sample size in this provenience. Examination of both dorsal cortex and platform attributes suggests that all stages of reduction are represented. Of the 10 flakes with dorsal cortex recorded, 70% (7) lacked any cortex. Cortex was observed on the dorsal surfaces of yellow wood, and other fossiliferous chert flakes. This tends to indicate that decortication, although limited, occurred at this location. Later stages of reduction, however, appear emphasized.

Among the five flakes (all yellow wood) which had platforms, a cortical platform, a collapsed platform, a simple platform, and a retouched platform were identified. One San Juan fossiliferous chert flake exhibited a ground platform. This suggests that some decortication, as well as formal tool manufacture occurred at this location. Test excavations also support this inference (see Provenience 6).

Evidence for tool use is quite limited, as is expected given the small sample of items recovered from the surface. Only one flake manufactured of yellow silicified wood exhibited use wear (unidirectional scars and rounding).

The biface recovered from this provenience (silicified wood) may be a manufacturing failure. It was classified as a functionally incomplete early biface. This suggests that this tool was discarded before being used.

The low variety and frequency of artifacts from the surface suggest that activities within this area were more limited than within the main site area. Evidence for all stages of reduction are present, yet frequencies remain low and material types are limited. This suggests a more limited use of this area than observed in other parts of the site.

Provenience 6 • Provenience 6 represents the artifacts recovered from subsurface testing in this northeastern area. A total of 386 lithic artifacts and two pieces of groundstone (included with the MNGI of provenience 5) was recovered. There are 312 flakes, 19 bipolar flakes, 2 retouched flakes, 37 pieces of small angular debris, 2 bifaces, 11 cores, 1 chopper and 1 fire spall.

Material variety is limited in this area, as indicated by the surface assemblage. Although seven raw material types are represented, which is three more than observed on the surface, the vast majority of the assemblage (370, 95.6%) is yellow silicified wood. This indicates reduction involving fewer materials than in the main site area. With the exception of 12 San Juan fossiliferous chert artifacts, the other materials are represented by only one item each.

Reduction information suggests that tool manufacture may not have been as heavily emphasized in this area as in the main portion of the site. Although the majority of the flakes lacked any dorsal cortex (225 [67%] of the 334 flakes with dorsal cortex recorded), this frequency is much less than in the main site area (92% in Provenience 5). In addition, at least one flake with dorsal cortex was recorded for all material types represented by flakes. This suggests that decortication of at least 4 material types may have occurred in this area.

Platform types also indicates a difference between reduction in this area and in the main site area. Cortical flake platforms were recorded on only yellow silicified wood, yet comprise 20% (35 of 170) of the assemblage of flakes with platforms. Prepared platforms (retouched and ground) comprise only 14% (26 platforms) of this assemblage. This is considerably lower than exhibited in the main site area (Provenience 5 had 43% prepared platforms). This suggests that earlier stages of reduction were emphasized in this area.

Of the 13 retouched platforms, all but one (San Juan fossiliferous chert) are yellow silicified wood. This suggests that at least two retouched tools were manufactured here. At least one tool of yellow wood and one of San Juan fossiliferous chert were manufactured at this location.

Eleven cores were recovered from Provenience 6. The majority of these (7, 63%), are yellow silicified wood. Two of these are tested cores, one is a regular multiplatform core, three are exhausted multiplatform cores, and one is an exhausted bifacial core. The remaining cores are made of conchoidal wood (one regular multiplatform core), San Juan fossiliferous chert (one regular multiplatform core), Brushy basin chert (one bifacial core), and moss jasper (one tested core). These data also indicate an emphasis on reduction of yellow silicified wood, although other materials were also reduced at this location.

Tool data are somewhat limited. Formal tools are limited to two bifaces and one chopper. Both bifaces are recorded as functionally incomplete, suggesting that they may be manufacturing failures. One was manufactured of a silicified wood (red shades), and one was manufactured of San Juan fossiliferous chert. Expedient tools were all manufactured of yellow wood, and include two retouched flakes (one with unidirectional use wear), and three unmodified flakes with use-wear along an edge (all unidirectional). This suggests that scraping was of primary importance in this area. Two pieces of groundstone were also recovered from the provenience but are summarized with the MNGI of Provenience 5. These fragments are one piece of a grinding slab, and one piece of a metate or slab. Both of these are made of sandstone.

In summary, this provenience is characterized by more emphasis on earlier stages of reduction than exhibited within the main site area. Evidence for decortication of several materials is indicated; however, yellow wood was preferred for most reduction in this area. At least two tools were apparently manufactured, and both bifaces appear to be manufacturing failures. Evidence for tool use is somewhat limited compared to the main site area. Some limited scraping probably occurred, as indicated by the four expedient tools with unidirectional use wear.

Northernmost Area

All of the assemblage from this area, both surface and subsurface, is summarized as Provenience 4. Only two items were recovered.

Provenience 4 • Provenience 4 consists of only two flakes, one manufactured of high surface gravel (with unidirectional use wear and no dorsal cortex) and one of quartzite (collapsed platform and 51-75% dorsal cortex).

Summary

The lithic assemblage from FA 2-13 is impressive in both frequency and variety. A variety of artifact types and material types are present, as well as three hearth-related features. The site was divided spatially into three general areas, and these exhibit different assemblage composition. The northernmost test area includes only two flakes. The northeastern area and the main site area include frequencies worth discussion.

The main site area is characterized by high density and diversity in artifact and material types. Later stages of reduction are emphasized, specifically formal tool manufacture, although all stages of reduction are represented. Tool maintenance and use are also represented. Tool-uses, as reflected by wear patterns, included cutting, drilling and scraping. Scraping appears to have been emphasized, as indicated by frequencies of unidirectional use-wear on lithic artifacts. Grinding was also of primary importance and numerous grinding implements of several types were present. Hunting, as reflected by numerous projectile points and bone fragments, was also of importance in subsistence. Several tool types usually associated with the manufacture of other tools were also present.

The northeastern site area exhibits less artifact variety and frequency than does the main site area. This is interpreted as indicating a more limited use of this area, focusing primarily on the reduction and limited use of yellow silicified wood. Although all stages of reduction appear represented, emphasis on earlier stages of reduction is suggested. Tool use was also limited, with only four tools exhibiting use-wear (all unidirectional). This suggests that within this area, tool manufacture and use were limited, and only scraping occurred or produced identifiable use-wear.

The assemblage from the main site area appears quite different from the northeastern area. It is unclear how these two areas may be related. They may represent discrete activity areas within the same site, or separate occupations at FA 2-13.

Examination of the assemblage as a whole indicates an extensive occupation based on both frequency and diversity of artifacts. The high variety of artifact types, presence of features, tool-maintenance evidence, and tools associated with tool manufacture, all suggest that this site was a residence of indeterminate duration. What kind of residence, however, presents is unclear. Although the assemblage is typical of what could be considered Archaic base camps (see Rollefson 1974:7-4), other research indicates that base camps cannot be defined on the basis of site size and diversity alone (Moore 1980: 361). Repeated occupation for short periods may produce assemblages similar in size and diversity to assemblages from sites occupied for one long, intensive episode. These issues will be explored in depth in the next section.

Conclusions

Research in the Farmington area has been concentrated south of Farmington, and includes the Navajo Mine Archeological Project (NMAP [Hogan and Winter 1983]), the Coal Gasification Project (CGP [Reher 1977]), the Utah International Project (UII [Moore and Winter 1980]), and the Navajo Indian Irrigation Project (NIIP [various reports]). Much of this research has focused on the Archaic period, and has emphasized settlement patterns and classification of site types, specifically the definition and location of base camps.

The CGP Survey examined the question of site location and type relative to resources. Reher and Witter (1977: 114) suggested that sites should be located in areas of vegetative diversity so that Archaic hunters and gatherers could maximize their cost/return ratio by exploiting a wide range of plant species. The analysis of vegetative diversity in the CGP survey area indicated that Archaic sites did in fact appear to be located in such areas. An Archaic site types classification was presented in their analysis, and special-use sites and campsites were defined. Generally, the campsites included more hearths and greater diversity of tools.

Vogler (1983) argued, using the NIIP data, that Archaic groups located residential sites (base camps) with respect to water. He argued that Archaic sites should be located near water and in areas of high vegetative diversity. Base camps were defined in a manner similar to the CGP survey. Classifications were based on assemblage size and diversity, and the presence of facilities reflecting an intense seasonal occupation.

Reynolds (1980; Reynolds, Cella, and Caballero 1984) applied discriminant analysis to additional NIIP data to define site types on the basis of their assemblage characteristics. Base camps were one of four types initially defined on the basis of the survey data. Reynolds described base camps in more detail using excavation data. Major base camps in this analysis were characterized by high frequencies of debris (heavy emphasis on fire-cracked rock), relatively few cortical flakes, and little evidence for primary reduction relative to the other clusters of sites.

Given the location of FA 2-13 in respect to water and vegetation diversity, the site can be easily classified as a major Archaic base camp.

FA 2-13 is located close to numerous water sources. Seasonal water could be expected $o flow in the Farmington Glade less than 1 km. to the west. Permanent water could be found in the La Plata River 2.13 km. to the west, in the Animas River 5 km. to the southeast, and in the San Juan river 5 km. to the south. In addition, Brown spring is located 4.5 km. to the north. All of these water sources could be reached in a day.

Vegetative diversity is high in this area, as is diversity of landforms. The Farmington Glade Arroyo and its associated floodplain contain riparian vegetation and scrubs. In the immediate vicinity of the site the vegetation is grasses and scrubs, associated with stabilized dune. Pinyon and juniper are located to the east on Hood Mesa, and to the west above the talus slope that overlooks the aroyo.

Assemblage characteristics also fit well with the base camp models presented above. FA 2-13 is characterized by high frequencies of artifacts and considerable diversity. In addition, flakes with cortex are generally under-represented compared with most of the sites in the area. Evidence for primary reduction is limited, while fire-cracked rock is well-represented.

Although this site could be considered a classic base camp, additional research in the Farmington area suggests that identification of base camps simply on the basis of site size and diversity may be erroneous. It is clear that the issue of multiple occupation must be addressed, especially since multiple occupations can be expected to occur in areas that offer a wide range of options or resources.

Some evidence from both the NIIP project areas and the CGP project area indicates that multiple occupations of Archaic campsites may be more frequent than initially suspected. Del Bene and Ford (1982: 1123) noted of the NIIP Block VI-VII excavated sites, that evidence of multiple occupation was highest in sites near variable terrain or well-developed drainages. In addition, evidence from the NMAP project suggests that many of the CGP sites may actually be short-term microband camps occupied repeatedly during a particular season (Hogan and Winter 1983).

Given these findings, FA 2-13 might be expected to have been occupied for more than one season, especially since it is located next to a drainage and in an area of variable terrain. Possibly this site was occupied as late as Anasazi time periods, given the presence of an Anasazi-style projectile point.

The stratigraphy at FA 2-13, however, does not clearly indicate multiple occupations. The cultural deposits at this site are disturbed, but appear to indicate a concentrated occupation within a relatively short time span, possibly a single season or two seasons. Thus, it is unclear, based on stratigraphy alone, if this site represents multiple occupations or a single occupation.

Examination of macrobotanical remains (Toll, this volume) and pollen (Scott Cummings, this volume) suggests that occupation of the site occurred in late summer or early fall, with the occupants exploiting a relatively restricted resource base. Faunal evidence (Bertram, this volume), appears to indicate a late fall or early winter occupation, and to reflect the frugal use of one or two deer and a few smaller mammals. Given these results, a fall occupation seems likely, concentrating on a narrow-spectrum resource base. Also likely is the reoccupation of this area in one or more fall seasons.

This pattern most closely fits with the suggestion by Elyea and Hogan (1983) that Archaic settlement patterns in the area are best described as a serial foraging strategy where microband base camps are located near water and/or concentrations of seasonally abundant plant resources. Residential sites in this model are expected to have been reoccupied, since they were close to water. FA 2-13 appears to represent a camp of this type.

Although Bertram suggests (this volume) that FA 2-13 is a hunting station, this classification suggests that procurement of faunal resources was the primary function of the site. Although frugal consumption of faunal resources is indicated, this classification is very misleading when the entire assemblage is considered. Given the high frequency of groundstone, diversity in the tool assemblage, and the models of settlement in the area, it appears more likely that FA 2-13 is located in response to water and plant resources rather than faunal resources.

In sum, FA 2-13 may have been a microband residence occupied for one or more fall seasons in the Armijo phase of the Archaic. It appears to represent the exploitation of a narrow-spectrum resource base, particularly focusing on goosefoot, seepweed, and juniper berries. Faunal resources were also an important supplement to the diet. This pattern fits well with a serial foraging model, emphasizing the importance of water and plant resources in settlement and subsistence.

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Chapter 8 • Lithic Analysis

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Introduction

This chapter describes the lithic materials that were recovered from 26 prehistoric and historic sites in the Farmington portion of the Elena Gallegos Land Exchange. The methods of chipped stone and groundstone analysis that were adopted for the project will be described, and summaries of lithic materials from each site will be presented. Twenty-two sites were tested and four sites underwent more extensive excavation. The lithics of site FA 2-13 are discussed in the report on that site (Schutt, this volume).

The analysis of materials from sites in the Elena Gallegos Land Exchange was conducted over several years. Because of the longevity of the project there are some basic inconsistencies in the data that are presented in this report. In some cases artifact numbers presented in this text do not match the numbers in the various project data bases. These inconsistencies in the data arose from the following factors: (1) reanalysis of artifacts by different analysts; (2) artifact losses; and (3) employment of different computer specialists.

A large number of the artifacts were analyzed several times. Due to problems with the original analysis, some materials required restudy. Due to the duration of the project, many lithic analysts participated in this second analysis. This resulted in some critical inconsistencies in artifact and attribute identification. These data problems prompted the third level of reanalysis, which was carried out by the author. A portion of the debitage was reexamined in this third analysis, as well as all cores, tools, and groundstone. This resulted in a number of artifacts being reclassified, with consequent changes in various artifact counts. The counts of cores, tools, and groundstone presented in the text are the result of the final specialized analyses that were carried out by the author.

Lithic artifacts examined during these analyses were moved from one place to another, resulting apparently in some artifact losses. As artifacts were pulled for drafting and photographing, some were either misplaced or lost; this also contributed to inconsistencies in artifact numbers. The numbers presented in the text represent the artifact totals resulting from the final analysis.

The computer output which was required for many levels of data interpretation was produced by two specialists. This resulted in some initial inconsistencies in data presentations. Tables which describe artifact variation may be presented in different formats, but with a few exceptions, present the same information.

Chipped Stone Analysis

The lithic analysis that was adopted for the Farmington lithic assemblages was aimed toward gaining maximum subsistence information from sites that were primarily comprised of lithic artifacts. The following section describes the attributes selected and discusses their meanings as they relate to research goals. The definitions presented are for the most part combined from a number of sources (Chapman and Schutt 1977; Schutt 1982a, 1983a, 1983b, 1988).

The analysis of lithic artifacts was conducted by several specialists. The majority of debitage recovered from the Farmington portion of the Land Exchange was analyzed by Stephen Fischer and David LeGare. Other parts of the analysis were done by persons trained by the author to ensure consistency among individuals. As noted, I was responsible for specialized studies on groundstone, cores, and formal tools.

Material Type

All lithic materials were examined for material type to aid in identifying the source of raw materials, and to isolate technological factors that relate to reduction and tool manufacture. Once source areas are identified it is possible to discuss prehistoric movement within an area, potential exchange with other populations, and factors that contribute to material selection and acquisition.

In addition to identifying source areas, material type was monitored to identify raw materials that occur in the same nodule. Once the range of materials that are associated within a given nodule are identified, it is possible to begin to discuss the various reduction and tool manufacturing techniques utilized by prehistoric populations.

Lithic materials were identified with a four digit code developed by A.H. Warren (Warren 1967). A material type collection was compiled during the analysis. Artifacts of various material types were removed from collections and catalogued by material type for comparative purposes. A. H. Warren was consulted to maintain proper identification. Technicians were urged to consult one another through all phases of analysis to maintain consistency among observers.

Table 8-1 describes the materials encountered on sites in the Farmington area. A variety of individual material types were lumped into categories that reflect source areas and individual lithic nodules. The lumped material categories depend on the geographic location and the geology of the study area, as well as the confidence one has in consistent material identification. In some geographic areas raw materials are so different that misidentification is unlikely, while in others slight variation between nodules result in subtle distinctions. Additional potential for misclassification occurs when large numbers of artifacts are coded over a long period of time. All these factors were considered when the final material stratification was developed.

The raw material types present on sites in the study area are for the most part locally available. Non-local materials include Jemez and Polvadera Peak obsidian, as well as various basalts. Although x-ray fluorescence trace-element analysis was not conducted on the obsidian recovered, our visual source identifications merit confidence. Sappington found that obsidian visually identified as Polvadera Peak by Schutt (1983), during the Navajo Mine Archeological Project, did in fact originate from Polvadera Peak (Sappington 1983: 615). The nearest sources of glassy basalt (3700) are in the No Aqua and the San Antonio Mountains, west of Quemado, and in the Cochiti area.

Table 8-1. Farmington Area Material Type Stratification.

Silicified Wood

1 YELLOW: Yellow but may grade to red. May occur in a localized source in San Juan Basin. (Materials include: 1150, 1120.)

2 CONCHOIDAL: Light and dark, ranging from chert to chalcedony with conchoidal fracture. (Materials include: 1111, 1112, 1113, 1140, 1141, 1142.)

3 SPLINTERY: Light and dark; splintery and dull. (Materials include: 1109, 1110.)

4 PALM: Palm wood with vascular rays. (Materials include: 1130.)

Chert

5 FOSSILIFEROUS SAN JUAN: Cream to light red and gray. Some misclassification required lumping. San Juan Basin; Permian. (Materials include: 1011, 1016, 1017.)

6 FOSSILIFEROUS HIGH SURFACE: May be banded, varicolored; glossy luster, fossils include needle or seed-like forms. High Surface gravels, Tertiary, San Juan Basin. (Materials include: 1014.)

7 OTHER FOSSILIFEROUS: Undifferentiated. Probably Permian. (Materials include: 1010.)

8 MORRISON MOTTLED: Colors range from reds, grays, white, and greens; they are generally mottled. Upper Morrison Formation. (Materials include: 1400, 1420, 1422, 1425, 1430, 1431, 1434.)

9 MORRISON LIGHT: Cream and white, grades to light green. Upper Morrison, San Juan Basin. (Materials include: 1020, 1022.)

10 MORRISON UNDIFF. TAN: Light colors, tan, yellow, cream and orange; undifferentiated. Probably Morrison Formation. (Materials include: 1620, 1630, 1635, 1640, 1660, 1680.)

11 MORRISON UNDIFF. GRAY: Gray, undifferentiated. Probably Morrison Formation. (Materials include: 1600, 1610, 1650.)

12 BRUSHY BASIN: Green, pink, gray; associated with baked shales. Brushy Basin Mb., San Juan Basin. (Materials include: 1040, 1041, 1042, 1044, 1046.)

13 BRECCIA: Undifferentiated. (Materials include: 1570)

14 UNDIFF. BLACK: Black; undifferentiated. (Materials include: 1030, 1031.)

15 OTHER CHERT: Porcelainites, clayey; undifferentiated. (Materials include: 1500, 1520.)

Chert and Chalcedony

16 HIGH SURFACE GRAVELS: Includes a number of cherts and chalcedonies, white and clear, moss inclusions, milky white inclusions. High Surface Gravels. (Materials include: 1050, 1051, 1052, 1053, 1054, 1055, 1057, 1090, 1091, 1092, 1098, 1099, 1200, 1201, 1210, 1211, 1213, 1215, 1240, 1300, 1320, 1330.)

Chalcedony

17 MOSS JASPER: Yellow and red chalcedony; moss inclusions(moss jasper). Undifferentiated. (Materials include: 1060, 1061, 1063, 1070, 1071, 1075, 1220, 1221, 1230, 1231, 1232, 1233.)

18 BANDED: Banded; miscellaneous. (Materials include: 1250.)

Obsidian

19 POLVADERA PEAK: Smoky gray with fine white inclusions, black dust. Probably Polvadera but may be difficult to distinguish from other Jemez obsidian. (Materials include: 3530, 3531.)

20 JEMEZ: Clear to brown or gray tinges, may have brown streaks or white spherulitic inclusions. Jemez Mountains. Also known to occur in gravels. (Materials include: 3520, 3524, 3525.)

Igneous

21 INTERMEDIATE GRANITICS: Granitic rocks; phaneric, aphanitic with phenocrysts, syenitic. (Materials include: 3000, 3015, 3030.)

22 MELAPHYRE: Aphanitic with phenocrysts. (Materials include: 3055.)

23 OTHER IGNEOUS: Includes a number of low frequency igneous rocks; from intermediate hornblendes, porphyry, diorite hornblende, hornblendite, and basalt. (Materials include: 3036, 3075, 3241, 3400, 3491, 3700.)

Metamorphic

24 QUARTZITE: Undifferentiated, various colors. Probably Morrison Formation and High Surface gravels. (Materials include: 4000, 4005, 4010, 4060.)

25 HORNFELS: Include dark fine grained, light green and black. San Juan Area. (Materials include: 4350, 4351, 4352.)

26 OTHER METAMORPHIC: Includes a number of low frequency metamorphic rocks; argillite, schist, greenstone, gneiss, and various quartz. (Materials include: 4200, 4450, 4510, 4525, 4750, 5000, 5011, 5020.)

Sedimentary

27 SANDSTONE: Undifferentiated. (Materials include: 2000, 2010, 2021, 2070.)

28 HIGH SURFACE QUARTZITIC SANDSTONE: Quartzitic sandstone, siltstone, miscellaneous, mottled tan and gray, red. High Surface gravels; San Juan Basin. (Materials include: 2200, 2221, 2270, 2204.)

29 LIMESTONE: Gray, undifferentiated. (Materials include: 2700.)

Artifact Type

Artifact identification was aimed at classifying multi-functional tools when possible. To this end, a number of combined categories were developed. A core, for example, may exhibit evidence of use as a chopper or a hammerstone; such artifacts would be classified as core/choppers or core/hammerstones. The definition of each artifact type is given below. An attempt was made to describe how each artifact class and attribute was used to identify prehistoric subsistence and technology.

Flake • A flake is a piece of debitage that exhibits definable ventral and dorsal surfaces. The ventral surface is the surface that was last attached to the larger rock from which it was removed.

Bipolar Flake • A bipolar flake may exhibit "...a negative bulb of percussion on one or both surfaces, or the presence of two positive bulbs of percussion on opposite surfaces, or on opposite ends of the same surface. Bipolar debitage often exhibits crushing upon distal and/or proximal ends" (Chapman and Schutt 1977:86). Bipolar reduction is viewed as an extremely random technique of flake manufacture, and is generally used to reduce nodules too small for freehand percussion.

Angular Debris • "Small angular debris is debitage which exhibits no definable ventral surface, but does exhibit conchoidal scars indicative of percussion manufacture" (Chapman and Schutt 1977:86). In the past a weight of 40 grams was used to distinguish between small and large angular debris (Chapman and Schutt 1977:86). Large angular debris is an artifact that does not meet criteria to be classified as a core or a flake yet exhibits conchoidal fracture. Where small angular debris is viewed as shatter resulting from the reduction process, large angular debris is considered a type of core material.

Biface • A biface is a formal tool that exhibits retouch extending over one-third or more of both surfaces of the artifact. Bifacially manufactured tool may include projectile points, preforms, drills, knives, etc. These tool categories are generally defined by overall morphology and evidence of use-wear. Bifacial tool manufacture represents a formal type of tool production which requires a more specialized manufacturing technology.

Uniface • A uniface is a formal tool that exhibits retouching extending over one-third or more of one surface of the artifact. In general, unifacial tools are used for scraping. Unifacial tool production, again, represents formal tool manufacture.

Scraper • A scraper is a type of uniface that exhibits use-wear indicating that it was used in a scraping motion.

Preform • A preform is a category of biface that exhibits bifacial retouch yet lacks evidence of bifacial thinning. It represents an early stage of bifacial tool manufacture.

Projectile Point • Projectile points are generally produced through biface production. Their overall morphology is characterized by a point and two similar lateral sides that facilitate piercing. Bases were shaped to facilitate hafting.

Drill • Drills exhibit bifacial retouch or extensive marginal retouching. The retouching is aimed toward producing a projection and a handle. When wear patterns are present rotary wear can be identified. Rotary wear is characterized by scarring or edge abrasion on the shaft of the projection which is produced as the tool is twisted in the drilling process. The tip exhibits either crushing or rounding.

Burin • A burin is a chisel-like implement modified from a flake or blade. Edges parallel to the long axis are removed or obliqued, forming a right angle on one or both edge margins (Crabtree 1972:48).

Perforator • Perforators are projections exhibiting wear characterized by rounding or striations on the tip and along the shaft. Wear indicates that the tool was punched through a soft material. Striations are generally parallel to the shaft and extend from the tip.

Graver • "Gravers are also projections that are designed to have a functional point that is used to incise or form organic materials and soft stone" (Crabtree 1972). Unlike drills, they do not require a long shaft. Gravers are generally produced through marginal retouch and exhibit step fractures on the tip, indicating that they were used in a scraping motion.

Denticulates • Denticulates are artifacts that exhibit prominences resembling teeth, similar to a saw blade (Crabtree 1972:58). Identifying their function should depend on the location and type of wear patterns. If wear patterns are confined to the tips of the teeth alone, the tool was probably used in a manner similar to a graver, for incising. If, however, the wear pattern is characterized by rounding on tips as well as between the teeth, the tool was probabiy used to seperate fibers (e.g., of Yucca). One must examine wear patterns and their location to gain as much functional information as possible.

Cores • Several core classes were identified in the analysis. During initial stages of analysis regular as well as exhausted cores were monitored. Regular cores are defined as pieces of debitage that exhibit negative scars, two or more centimeters in length, originating from one or more platforms. Regular cores are viewed as raw material that can still produce usable flakes. Exhausted cores are pieces of debitage that exhibit negative scars between one and two centimeters in length. These scars may originate from one or more platforms and can be distinguished from retouching on the basis of scar regularity along an edge margin. Where retouching is aimed at producing a uniform edge for tool use, flake removal from exhausted cores is aimed at producing flakes, resulting in more irregular edge margins. Exhausted cores represent the maximum use of raw materials.

The number of flakes removed from each core was recorded during the initial analysis. Specialized analyses conducted on cores at a later point recorded the number of flakes removed from each platform as well as the total number of flakes removed. This information was monitored to aid in quantifying three subjective core type categories. These subclasses of cores were identified among regular and exhausted cores. Core types monitored include single platform cores, multiplatform cores, and bifacial cores. Tested cores were also recorded.

Single Platform Cores. Single platform cores exhibit a single striking surface from which flakes are removed. Generally these cores are conical and the flakes that are removed are similar in length, suggesting a systematic technique of core reduction (Schutt 1983b:72).

Multi-Platform Cores. Multi-platform cores are cores that exhibit more than one striking platform, from which any number of flakes were removed. Generally flakes are removed from any usable platform, resulting in a fairly random reduction technique which produces flakes of varied lengths (Schutt 1983b:72).

Bifacial Cores. Bifacial cores are similar to bifaces in overall morphology; however, they exhibit steeper edge angles along edge perimeters, and high centers. Flakes are removed from either surface adjoining the edge margin by using the opposing surface as a striking platform. This core reduction technique results in an artifact similar to a biface but lacking evidence of bifacial thinning. Additionally, this technique produces not only flakes that can be used either expediently or manufactured into formal tools, but also a core that can easily be transformed into a formal tool (Schutt 1983b:72).

Tested Cores. Tested cores are pieces of raw material that were examined for material quality and rejected. Generally, a single flake is removed and the core is discarded due to poor material quality. Tested cores represent initial stages of raw material selection.

Chopper • A chopper is a tool exhibiting battering on an edge formed by the intersection of two surfaces. The edge is sharp and wear indicates use in a chopping fashion. A large portion of tools that were used as choppers were classified as cores with chopper use. Generally, the primary function of the tool was a core, with secondary chopper use.

Hammerstone • During initial stages of the lithic analysis, artifacts that exhibited evidence of battering suggesting use as hammers were classified as hammerstones. In the past, rocks that exhibit evidence of battering have been categorized in this way. Yet when overall hammerstone morphology is examined it is clear that a number of hammerstone types representing distinct activities exist (Schutt 1982b:161-166). To aid in identifying this additional functional information, three hammerstone sub-types were identified: knappers, groundstone sharpeners (peckers), and pounders (defined below). Although these classes represent three different activities, it appears that there may be additional hammerstone types within these categories.

Knapper. Knappers are cobbles that exhibit battering on a localized portion of their smooth cortical surfaces. This type of battering is characteristic of use as a knapper or hammer for the manufacture of chipped stone artifacts.

Groundstone Sharpener (Pecker). Ground stone sharpeners are angular pieces of raw material or cores that exhibit battering on sharp edges. Their angular nature and the location of battering, clearly do not represent use in chipped stone manufacture. Groundstone sharpeners were used to roughen grinding surfaces and are known to occur in direct association with other grinding implements. Several tabular artifacts with battering similar to that found on groundstone sharpeners were also identified. These artifacts were separated to determine if they represent another artifact class. Their small number prohibited identifying tool function.

Pounders. Pounders exhibit massive battering on a convex surface. The battering is much more extensive than that identified on peckers, and generally results in a uniformly smooth, battered surface. This type of wear probably results from pounding another material against an anvil.

Wedge • A wedge is an artifact that is pie shaped in cross section. Wear is characterized by crushing on the edge, and in some cases, striations that are perpendicular to the wedge edge. Battering on the large end results from hammering the wedge into place.

Unmodified • Objects that were initially picked up during excavation and later found to exhibit no evidence of human alteration were classified as non-cultural.

Retouched Rock • These artifacts are tabular pieces of silicified wood that have been retouched or altered.

Fire Spall • Fire spalls are pieces of lithic material that blow off from intense heat. These pieces of rock are characterized by an irregular, fire-cracked, dorsal surface. Fire checks or minute rectangular cracks (Crabtree 1972:64) may also be present.

Metate • Metates are the stationary portion of a grinding unit and are pieces of stone on which manos are used to grind various materials. Grinding surfaces indicate that a mano was moved in a forward and backward motion. These artifacts are generally associated with grinding vegetal materials.

Mano • Manos are hand-held pieces of stone which are used to grind materials on a metate. Evidence of use appears as abrasion, which results in a flat or convex surface, indicating that the tool was moved in a forward and backward motion.

Undetermined Groundstone • Groundstone artifacts that are fragmentary and exhibit a portion of a grinding surface, yet lack characteristic morphology to classify, were identified as undetermined groundstone.

Grooved Maul • Mauls are artifacts that exhibit battering on a rounded or blunt area. Wear suggests use in a pounding manner (Chapman 1977).

Axe • Axes exhibit a sharp edge for chopping or cutting which is usually manufactured through retouch and/or grinding. These tools are grooved for hafting.

Hafted Hoe • A hafted hoe is a flat stone that has been grooved for hafting, and is used to work soil. These tools generally exhibit rounding and polish on the used edge.

Hand-Held Hoe • A hand-held hoe exhibits rounding and polish similar to that of a hafted hoe on its used edge, but it lacks a hafting element.

Anvil Stone • An anvil stone is a rock that is used as a work surface to pound or cut other materials upon. Wear patterns may include impact points or cuts.

Portion

Artifacts were classified as either whole or fragmentary. The portion of an artifact recovered was noted to describe the tool's condition.

Cortex

Six categories of cortex were monitored: none, 1-25%, 26-50%, 51-75%, 76-99%, and 100%. Cortex on flakes was measured as the percent of dorsal surface, while the overall percentage of cortex was monitored on all other artifacts. The amount of cortex on artifacts was used in conjunction with other attributes to identify stages and techniques of reduction. The frequency of flakes within each cortex category was tabled to aid in stratifying the cortex categories that represent primary versus secondary reduction.

Platform Type

The striking platforms on flakes were examined for overall morphology to aid in identifying methods of tool manufacture and core reduction. Additionally, they were monitored to distinguish between manufacturing and resharpening flakes. Six platform types were observed, as follows.

Cortical • Cortical platforms are striking surfaces that exhibit a portion of a remnant cortical surface.

Collapsed • A flake with a collapsed platform lacks the actual striking surface, yet exhibits morphology suggesting that the proximal portion of the flake is almost complete.

Facet • Faceted platforms include both single and multi-faceted striking surfaces. Single facet platforms exhibit one, smooth, non-cortical surface that does not originate from an edge perimeter on the platform. Multi-facet platforms exhibit two or more non-cortical facets that do not originate from an edge perimeter. These platforms are generally viewed as resulting from core reduction rather than formal tool manufacture.

Retouched • "Retouched platforms exhibit small retouch scars originating form what was the edge margin of the retouched artifact prior to flake removal" (Schutt 1982a). Flakes with retouched platforms are generated when a biface or uniface are manufactured or resharpened. Although they are defined as <u>retouched platforms</u>, it is the remnant of facial retouching that occurred prior to flake removal that is observed, not retouching on the platform that occurred after the flake was removed. Retouched platforms were also examined for evidence of platform preparation and utilization prior to flake removal from the original tool. Although this distinction cannot be made on all flakes with retouched platforms, enough cases are clearly distinguishable to warrant monitoring (Schutt 1984). During the Kaiser Steel analysis of site KS120 (Schutt 1984), this distinction could be made on 36% of all flakes with retouched platforms. While grinding preparation on retouched platforms results in a flatter, less lustrous surface, rounding resulting from utilization is not flat and is generally very lustrous.

Ground • Ground platforms exhibit abrasion resulting from platform preparation. This abrasion is generally flatter and less lustrous than rounding resulting from utilization; the latter is not flat and is very lustrous. Platform grinding may obliterate signs of other platform types.

Stepped • A stepped platform exhibits stepping resulting from platform preparation. Steps are abrupt and make it difficult to identify other platform types.

In addition, the angle at the intersection of the platform and dorsal surface plane was measured to determine if this angle could be used to distinguish between core reduction flakes and biface reduction flakes.

Utilization and Marginal Retouch

The presence of utilization or marginal retouch on flakes and small angular debris was recorded by its location on the artifact. With the ventral side up, right lateral, left lateral, proximal, and distal locations were monitored. Additional attributes monitored on utilized and marginally retouched flakes and pieces of small angular debris were edge shape (concave, convex, straight, notches, projections, concave/convex, denticulate, irregular, and break); the direction of use-scars and/or rounding (unidirectional or bidirectional); and the utilized edge angle. Edge angle was measured as the "...intersection of the dorsal and ventral surfaces of the debitage at the edge of the perimeter. The effects of usage upon edge angle morphology were not measured" (Chapman and Schutt 1977).

Marginal Retouch • Marginal retouch is the detachment of flakes from a tool's edge for the purpose of altering the shape of that edge. It is characterized as a series of negative scars which originate from an edge perimeter and extend over less than one-third of the surface of the artifact. Unidirectional marginal retouch occurs on one surface of the artifact, while bidirectional retouch occurs on both surfaces that intersect at the edge perimeter.

Utilization • All artifacts were examined for evidence of utilization with binocular microscopes, at magnifications ranging from 20-80x. The identification of wear patterns was based on previous work by the author in association with other lithic analysts (Chapman and Schutt 1977; Schutt and Vierra 1980).

An effort was made to use conservative criteria of consistency to identify edge damage resulting from past human activities. Experiments conducted over a number of years have proved that many non-cultural activities can produce edge damage similar to use-wear on chipped stone artifacts (Tringham et al. 1974; Schutt 1979, 1980, and 1982a). Therefore, edge damage that could possibly have resulted from non-human activities was not identified as use-wear. Four basic scar types and two types of rounding are characteristic of use-wear. These scars and rounding may occur in combination; however, their correlation with specific uses has not been demonstrated (Schutt 1982a). The following scar types and rounding were recognized as wear patterns.

Feather Scars • Feather scars "... are morphologically similar to many scars produced through retouch in that the distal and lateral portions of the scars feather out to meet the debitage surface, rather than terminating in abrupt fractures" (Chapman and Schutt 1977:89).

Step Fractures • "Step fractures are negative scars originating from an edge perimeter which terminate at their distal ends in abrupt steps or cleavages which are morphologically similar to macroscopically observable hinge fractures produced occasionally through debitage manufacture" (Chapman and Schutt 1977:89).

Crescentic Scars • "Crescentic scars are microscars which have resulted in detachment of a portion of the edge margin and equal portions of both flake surfaces adjoining the edge margin. These scars appear as shallow concave scoops along the edge margin" (Chapman and Schutt 1977:89). These scars may result from a range of uses (Chapman and Schutt 1977:89). Additional experiments indicate that these scars may result from an error in tool movement. Crescentic scars represent a snapping rather than a flaking of the edge. The snap occurs when force is applied at a 90-degree angle to the tool's edge. In sawing this would result from a lateral, side to side motion of the edge. Consistent crescentic scars were not recorded as use-wear because they can easily result from a number of non-cultural forces as well as from the improper use of the tool.

Nibbling • "Nibbling... is observed as relatively continuous sets of extremely small feather scars situated on one or both surfaces of an artifact adjoining the edge margin" (Chapman and Schutt 1977:90).

Rounding • "Edge rounding...is the result of abrasion of the edge margin itself and is quit often observed microscopically as a polish of greater or lesser degrees of luster along the edge margin" (Chapman and Schutt 1977:90). Rounding was recorded as bidirectional or unidirectional on the basis of the shape of the rounded edge. Bidirectional rounding is evenly distributed to both sides of the edge margin, while unidirectional rounding occurs more towards one face of the edge margin.

Striations • Striations are minute scratches resulting from contact between two media. Striations are extremely reliable indicators of how a tool was moved or how one tool contacted another (groundstone).

Battering • "Battering is the pounding application of force to a locus (loci) on some material against another material, resulting in conchoidal fracture patterns on natural surfaces or deterioration of the edge margins" (Schutt and Vierra 1980:29).

Polish • "Polish is observed as a sheen or mirror-like surface apparent on the edge margin and/or surfaces directly adjacent to the edge margin of the utilized artifact" (Chapman and Schutt 1977:92).

Pecking • Pecking occurs on an artifact as the result of hitting it with another stone object. Surface pecking was recorded on groundstone and is viewed as a procedure used to roughen the grinding surface for more efficient grinding. The tool used to roughen the surface is a groundstone sharpener or pecker.

Type of Wear

Wear patterns on flakes and small angular debris were reported as unidirectional or bidirectional. This distinction was based on the direction of rounding and the proportion of scars on either side of the utilized edge perimeter (Schutt 1982a:94-108). An edge with a scar ratio of 3.5:1 or greater on either side of the edge perimeter exhibits unidirectional wear, while an edge with less than a 3.5:1 ratio exhibits bidirectional wear. Unidirectional wear is viewed as resulting from scraping, while bidirectional wear results from cutting. The location of scars in conjunction with the overall tool shape was also used to identify tool type.

Individual scar types were recorded on artifacts other than flakes and small angular debris when wear patterns were identified.

Measurements

The length, width, and thickness of each artifact was measured to the nearest millimeter. The length on flakes and projectile points was defined as the measurement along the proximal-distal axis. Width was measured as the widest distance at 90 degrees to the length. Among all other artifact classes, length was measured as the largest dimension of the artifact. Thickness was measured as the third dimension of the artifact.

Weight

Each artifact was weighed to the nearest gram. Artifacts weighing less than 0.5 grams were recorded as zero grams.

Formal Tool Analysis

The formal tool analysis for the Elena Gallegos lithic artifacts was designed to maximize information about use and discard patterns, as well as provide chronological data. Facially retouched tools were examined to determine if they represent manufacturing failures or tools used and discarded at sites, to determine the stage of manufacture at which discard occurred, and to date diagnostic artifacts. This analysis is based on a number of studies carried out by the author (Schutt 1983a, 1986, 1988), which have been directed toward isolating objective criteria to distinguish between potentially usable tools and manufacturing failures (or artifacts that were never completed) and classifying bifacial tools into stages of tool manufacture (Schutt 1983b).

It has been accepted among many archeologists that formal tools recovered from sites represent tools that were utilized and discarded at the location of recovery. The presence of specific formal tool types has then been used to identify activities conducted at sites. The activities that are identified at a given location are then used to classify site types.

The formal tools that are recovered from archeological sites, however, may not have been used at them. If these artifacts represent manufacturing failures (tools broken during manufacture due to flaws in material or errors in knapping), interpretations of site function are changed considerably. Generally, manufacturing failures are found at manufacturing sites, not at use locations. It is critical that we distinguish tools that were manufactured, used, and discarded from artifacts that were merely broken and discarded prior to completion.

Both subjective and objective criteria have been developed to classify tools as functionally complete or incomplete. Subjective methods are less time consuming but require the trained eye of the lithic specialist. These methods do not result in easily replicated studies. The objective method requires more time but can be implemented by less-skilled observers, and is more easily replicated.

The formal tools that were recovered from the study area were classified as functionally incomplete (manufacturing failures) or functionally complete (tools). A subjective method of analysis (involving assessments of edge uniformity, breakage, material flaws, and knapping mistakes) was used to record data quickly. This method was also selected because the analysis was carried out by a single analyst who is a lithic specialist.

Tool function is conditioned by the edge shape of the utilized portion of the tool (Wilmsen 1968). Both facial and marginal retouch represent an attempt to change the edge shape of the tool to meet certain requirements. These requirements are conditioned by the activity that will be performed with the tool. Analyses of utilized tools recovered from archeological assemblages (Schutt 1983a) support this premise. Archeological data indicate that scraping tools with unidirectional wear patterns exhibit steeper edge angles, while cutting tools with bidirectional wear exhibit more acute edge angles.

In addition to possessing an edge shape dictated by a particular activity, a functional edge must also exhibit a uniform edge morphology, regardless of tool type. The various functions for which a tool is used may require a variety of functional edge shapes and lengths, but all activities require that the tool have a uniform functional edge to perform the task effectively. The functional requirement of a cutting tool is a sharp, uniform edge much like a modern day knife. The edge of the knife may be straight or serrated, but it must form a uniform straight line in plan view. The same is true of scraping tools. Although they are used functionally to perform different activities (cutting and scraping), a uniform edge is still necessary. Whereas the cutting tool requires a uniform sharp edge, the scraping tool requires a uniform edge that is not acute and that will withstand the force necessary for scraping. Projectile points require a point and two uniform lateral edges to facilitate piercing. Although overall tool morphology is different, the functional edges are all uniform.

Bifacially manufactured tools were also classified into another typology to provide information on stages of tool manufacture. This typology is based on a study done by Schutt (1983b) for a large formal tool assemblage near Rhodes Canyon, New Mexico. Bifaces in four stages of tool manufacture were monitored. This classification was used to determine the stage at which the biface entered the archeological record. Once identified these data can aid in determining the activities that occurred at sites prehistorically.

Formal Tool Attribute States

Formal tool attribute states are as follows.

Material Type • Material type was classified as described in the chipped stone analysis.

Portion • The condition of the artifact was recorded as whole, fragment, tip, or base. Tip and base were recorded for projectile points to aid in identifying breakage.

Cortex • Cortex was measured as previously discussed in the chipped stone analysis section.

Tool Type • Tool types that were monitored in this analysis include bifaces, projectile points, and artifacts with extensive marginal retouch. Definitions of these artifact classes can be found in the Chipped Stone Analysis section. In addition to their classification as a tool type, projectile points were assigned to chronological typologies.

Stage of Bifacial Manufacture • The stages of bifacial manufacture, and the biface types associated with them, were recorded to aid in identifying stages of breakage and discard patterns. This typology is largely taken from Schutt (1983b). Biface types include blanks, early bifaces, late bifaces, and bifacial tools. These are defined as follows.

> **Blanks** (Stage 1) are rough preforms that can be used to manufacture any number of tools. Blanks lack uniform retouching, bifacial thinning, and pressure flaking. They represent early stages of biface manufacture. **Early bifaces** (Stage 2) exhibit beginning stages of bifacial thinning. Edges are irregular both laterally and transversely. Portions of the edges often exhibit unworked areas. Early bifaces are manufactured from direct percussion and are larger than completed tools (Crabtree 1972). **Late bifaces** (Stage 3) are smaller and bifacially thinned. They generally exhibit well-shaped morphology and may show evidence of pressure flaking. **Bifacial tools** (Stage 4) are bifacially thinned and exhibit edges that can be produced through direct percussion or pressure flaking. Functional edges are uniform; overall morphology indicates that the tool is functionally complete.

Functional Completeness • Tools were examined to determine if they were functionally complete prior to discard or if they represent manufacturing failures or functionally incomplete artifacts. Artifacts are recorded as functionally complete, functionally incomplete, or undetermined, by using the criterion of edge uniformity (Schutt 1988). Artifacts were classified as undetermined when it was not possible to determine completeness.

Utilization • Artifacts were examined for evidence of microscopic use-wear. Although the identification of use-wear can provide evidence that a tool was completed and utilized, the lack of use-wear does not mean the tool was not used. The difficulty of identifying use-wear on retouched artifacts has been well documented (Keeley 1974; Odell 1975; Schutt 1982a). Tools that are classified as functionally complete were interpreted as utilized tools although they may not show wear with low power magnification.

Groundstone Analysis

The fragmentary nature of the groundstone assemblage, as well as the low number of ground artifacts, limited the analysis to the identification of tool types; determining the minimum number of grinding implements (MNGI) at each site; and identifying the sources of groundstone raw materials.

Through the identification of groundstone tool type it is possible to distinguish among a number of grinding activities. Once tool types are classified and specific attributes recorded it is possible to determine the minimum number of grinding implements. This method uses variation in groundstone attributes to identify fragments that could potentially belong to the same grinding implement (Schutt 1982b), without the time-consuming process of actually fitting groundstone fragments together. The resulting minimum number of groundstone implement counts represent the most conservative number of implements in a given assemblage. The MNGI can then be used to identify and compare the various emphases placed on grinding at sites in the study area.

Several attributes were selected to classify the groundstone assemblage. These attributes are defined below, along with a discussion of how each attribute was used to provide information about prehistoric subsistence.

Artifact Type

Groundstone encompassed four general kinds of artifacts; manos, metates, undetermined groundstone and other groundstone objects. These general categories included eleven groundstone artifact classes. These classes are defined below.

Mano • Three types of manos were recorded. Manos are hand-held pieces of stone which are used to grind various materials on a metate. They were most commonly used to grind vegetal materials. Use-wear is characterized by abrasion, resulting in a flat or convex ground surface, indicating use in a forward and backward motion. Manos may exhibit more than one grinding surface. Both one-hand and two-hand manos were classified on the basis of overall size. When it was not possible to determine if manos were of one- or two-hand type, they were recorded as <u>undetermined mano</u>.

Metate • Four metate classes were observed. Slab metates exhibit a flat grinding surface; basin metates a narrow, concave grinding area rimmed with stone; and trough metates, a narrow, concave grinding area that is open on one or both ends. When a piece of groundstone exhibited a concave grinding surface yet it was not possible to identify the type of metate, the artifact was recorded as <u>undetermined metate</u>. Grinding surfaces indicate that the mano was used against the metate in a forward and backward motion. Metates are the stationary portion of the grinding unit and are pieces of stone on which manos are used to grind various materials. Again, they were generally used to grind vegetal material.

Other Groundstone • Functional categories can be based on the character of abrasion, and on other observational data. A grinding slab is a flat stone that exhibits use-wear indicating that a repetitive forward and backward motion was not used. Generally use-wear suggests either a circular motion or a forward and backward motion in many directions. These kinds of wear suggest a function other than vegetal processing, and indicate that a substance or object was ground on these slabs. Uses may have included grinding stone pigment or shaping pendants. In some cases remnant pigment can be identified on a ground surface.

Ground axes exhibit a sharp edge for cutting and a groove for hafting. Functionally they are viewed as chopping or cutting implements. In several cases the function of a groundstone artifact could not be identified. This lack of clarity was not based on the artifact's fragmentary nature but on the unusual artifact shape. These artifacts were classified as <u>other groundstone</u>.

Undetermined Groundstone • A number of groundstone artifacts were too fragmentary to classify yet exhibited a portion of a grinding surface. These artifacts were classified as <u>undetermined groundstone</u>.

Material Type

Raw materials selected for groundstone use were monitored to identify sources of raw materials and to aid in identifying MNGIs. Material type was recorded as a four digit code, following A. H. Warren (Warren 1967). All raw materials used to manufacture grinding implements were acquired from local sources.

Raw materials were classified by grain size (coarse, medium, and fine) to aid in MNGI identification, as well as to isolate functional diversity among similar grinding implements. For example, three metates of similar grain size may indicate similar kinds of grinding; however, three metates each with a different grain size may suggest that vegetal materials were processed in a stage-like manner. Grain size thus has potential for isolating functional diversity.

Portion

The portion of the artifact recovered was recorded to aid in identifying MNIs. Groundstone artifacts were considered fragmentary when any portion of the artifact was missing.

Grinding Surface

The number and type of grinding surface was monitored to aid in identifying the minimum number of grinding implements at each site. The number of grinding surfaces, as well as the curvature of the surface were recorded. The following surface types were identified: one flat surface; one concave surface; one convex surface; two flat surfaces; two concave surfaces; two convex surfaces; one flat and one convex surface; and one flat and one concave surface.

Striations

The presence and directionality of striations was monitored to aid in identifying artifact type. The directions of striations provide the best indications of how a tool was moved across a medium (Schutt 1982:64-67). When striations are not present on groundstone one must rely on overall artifact shape and utilized surface shape to identify how the tool was used. For example, hand-held grinding artifacts may be used as a mano (forward and backward motion), or a floor polisher (circular motion). In this case the determination of artifact type is most accurately made on the basis of the direction of striations caused by use. Overall shape may be similar.

The presence or absence of striations was recorded for all groundstone artifacts. The directions of striations were monitored as parallel, perpendicular, or at various angles to the grinding surface. No artifacts in this assemblage exhibited striations that suggest a circular motion.

Other Use

Evidence of secondary use on grinding implements was recorded. Three types of secondary use were identified; use as an anvil, use as a hammerstone (knapper), and use as a groundstone sharpener (pecker).

Measurements

Length, width, and thickness were measured to the nearest millimeter. Length was measured as the largest dimension of the artifact. Width was the measurement at 90 degrees to the length, and thickness was the third dimension.

Farmington Lithic Summaries

The following section will present summaries of lithic materials that were recovered from each site. Sites are discussed in ascending number. These summaries will be followed by a discussion of isolated artifacts and a concluding section.

Data presented in these reports were provided by the USFS. While general site descriptions were taken from site reports presented in this volume, artifact counts and descriptions were generated in tabular form by USFS computer specialists. Analytical proveniences were selected on the basis of scatter diagrams that were generated by the USFS. For the most part these proveniences were defined by the computer analyst. In most cases the computer printout presents subsurface artifacts as a single provenience.

FA 1-1

FA 1-1 consists of a lithic and ceramic scatter with some groundstone. A hearth (Feature 1) and fire-cracked rock scatter were identified in Provenience 1. Dates for the site are based on ceramic analysis and radiocarbon dates from the hearth. Ceramics recovered from Provenience 1 date to A.D. 1100-1300 (Raish this volume), while the radiocarbon date in Feature 1 is 2738 B.C. ± 308 years (Bertram, this volume).

A total of 53 lithic artifacts was recovered from the site. These artifacts include 39 flakes, 7 cores, 1 hammerstone, 1 projectile point, and 4 pieces of groundstone. Lithic artifacts were manufactured primarily from locally-available intermediate granitic materials (33 artifacts). This material category was followed in frequency by quartzite (10 artifacts), San Juan fossiliferous chert (3 artifacts) and other metamorphic rocks (2 artifacts). The remaining five artifacts were manufactured from five additional, locally-available materials.

Scatter plots of lithic artifacts were used to identify potential activity locations. These plots identified two spatially discrete surface lithic scatters. Provenience 1, to the north, consists of a sparse scatter measuring approximately 100 m. N/S by 75 m. E/W, while the southern concentration (Provenience 2) measures 30 m. N/S by 50 m. E/W. Provenience 3 represents subsurface artifacts recovered from test excavations in Provenience 1. Lithic assemblages will be described for each provenience below.

Northern Artifact Scatter

Provenience 1 • Twenty-seven lithic artifacts were recovered from the surface in the northern artifact scatter. Seven additional artifacts were found in subsurface test excavations (Provenience 3). Surface artifacts included 23 flakes, 3 cores and 1 hammerstone. Seventy percent of these materials were manufactured from intermediate granitic rock.

Dorsal cortex and platform types suggest that both primary and secondary reduction occurred in this area. The amount of dorsal cortex and the number of cortical platforms indicate decortication of intermediate granitic materials.

Additional artifacts recovered from this area include a quartzite hammerstone and three cores. The cores were manufactured from intermediate granitics (2 cores) and hornfels (1 core). Two of these were multiplatform cores and one was a single platform core. All cores exhibited a high percentage of cortex (51-75%). No evidence of grinding was found in this provenience.

Provenience 3 • Seven lithic artifacts were recovered from subsurface test excavations in the northern artifact scatter. These artifacts include six flakes and one fire spall. Although few in number, these artifacts represent more variation in material types, as well as reduction technology, than artifacts found on the surface. With the exception of one quartzite flake, platforms and dorsal surfaces lack cortex, which in the surface assemblage clearly indicates primary reduction.

The subsurface assemblage instead exhibits evidence of resharpening and expedient tool-use. Two flakes manufactured from silicified wood and San Juan fossiliferous chert exhibit retouched platforms with use, or evidence of tool resharpening. The platform dorsal angles on these flakes measured 40 and 75 degrees, suggesting that scraping and cutting occurred. Two additional flakes exhibited expedient tool-use in both cutting and scraping.

Southern Artifact Concentration

Provenience 2 • Nineteen lithic artifacts were recovered from the southern artifact concentration. These artifacts included ten flakes, four cores, one projectile point, two manos, one piece of undetermined groundstone, and a flake from a piece of groundstone. A large percentage (63%) of these artifacts was manufactured from intermediate granitic rock.

Overall debitage variation is similar to the surface assemblage in the northern scatter. Again, dorsal cortex and cortical platforms suggest that the decortication of intermediate granitic material occurred at the location.

This area exhibited evidence for vegetal processing. Three pieces of groundstone were recovered: two manos, of quartzite and of sandstone, and one piece of undetermined groundstone.

The projectile point that was recovered exhibited En Medio morphology but appeared to have been broken during the latter stages of manufacture. It is unclear whether this point represents an earlier occupation of the site or curation by later occupants; however, the early radiocarbon date in Provenience 1 suggests multiple occupations at the site. A second Anasazi projectile point was also recovered from the site, although its exact provenience is not known. This point was manufactured from Santa Fe chert and exhibited successful heat treatment. Unlike the Archaic point, this projectile was functionally complete.

Summary

Lithic, ceramic, and radiocarbon data from this site suggest two occupations. The lithic assemblages recovered from site FA 1-1 indicate considerable technological and functional diversity that in some cases is spatially discrete. Both primary and secondary reduction, as well as tool use and resharpening, are indicated. The evidence for expedient tool-use, as well as the resharpening of formal tools, indicate that cutting and scraping occurred at the location. Groundstone suggests that vegetal processing may have also occurred at the site and that this activity occurred only in Provenience 2.

FA 1-2

FA 1-2 is a lithic scatter with some groundstone and four hearth remnants. One Mancos Corrugated sherd (ca. A.D. 900-1200) was also recovered. Radiocarbon samples obtained from two of the hearths yielded dates of 2255 B.C. ± 290 and 1220 B.C. ± 635 (Bertram, this volume).

One hundred and twenty-eight lithic artifacts were recovered from the site. These artifacts include 70 flakes, 30 manos, 13 metates, 6 cores, 4 fire spalls, 1 biface, 1 hammerstone, 1 tested core, 1 hammerstone/chopper, and 1 hammerstone/core flake. All these artifacts appear to be manufactured from locally-available materials. The majority of artifacts were manufactured from intermediate granitic rock (34 artifacts), sandstone (30 artifacts), and conchoidal wood (21 artifacts). Other materials include quartzite (12 artifacts), Morrison light chert (10 artifacts), basalt (7 artifacts), hornfels (4 artifacts), High Surface quartzitic sandstone (3 artifacts), High Surface fossiliferous chert (3 artifacts), and one artifact each of splintered wood and San Juan fossiliferous chert.

Scatter diagrams were used to plot lithic artifacts to aid in identifying activity locations. These plots defined four spatially discrete surface lithic scatters. Provenience 1, located near the center of the site, consisted of 33 lithic artifacts covering an area measuring 30 m. N/S by 16 m. E/W. Located east and southeast of Provenience 1, Provenience 2 consisted of 21 lithic artifacts encompassing an area measuring 75 m. N/S by 100 m. E/W. Provenience 3, situated northwest of Provenience 1, has 24 lithic artifacts covering an area 100 m. E/W by 60 m. N/S. The last surface provenience, Provenience 4, is located 25 m. south of Provenience 2 and consists of eight lithic artifacts within an area measuring 12 m. E/W by 5 m. N/S. Subsurface tests were also placed within Proveniences 1 and 2. The lithic assemblages from these test excavations are listed in Proveniences 5 and 6, respectively. Lithic assemblages are described by provenience below.

Center of Site

Provenience 1 • Thirty-one lithic artifacts were recovered from the surface in this provenience. An additional 42 artifacts were recovered from subsurface tests within this area (Provenience 5). These surface artifacts included twelve flakes, eleven manos, four metates, and one hammerstone. Also present were one cobble and two pieces of fire-cracked rock. Most of these artifact were manufactured from sandstone (ten artifacts), conchoidal wood (four artifacts), Morrison light chert (three artifacts), and other igneous (three artifacts). An additional four artifacts were manufactured from three different locally-available materials.

Of the twelve flakes recovered from this provenience, eight lacked dorsal cortex, two had cortex ranging from 1-25%, one had 26-50%, and one exhibited 76-99% cortex. This suggests that both primary and secondary reduction occurred within this area. One quartzite hammerstone was also recovered. No evidence of formal tool manufacture or expedient tool-use was evident in this assemblage.

A minimum of 12 grinding implements is represented by the 14 fragments of groundstone and 1 complete mano. The implements include three metates and nine manos. The majority of fragments were manufactured from sandstone (nine fragments), followed by other igneous (three fragments), quartzite (two fragments) and intermediate granitic rock (one fragment). The high proportion of groundstone within this provenience indicates this area was used primarily as a milling locus.

Provenience 5 • A total of 42 lithic artifacts was recovered from subsurface tests in this area. These include 32 flakes, 4 indeterminate mano fragments, 4 fire spalls, 1 grinding slab fragment, and 1 biface.

Commonly-used materials include conchoidal wood (17 artifacts), sandstone (6 artifacts), and intermediate granitic rock (4 artifacts). The remaining eight artifacts were manufactured from four different materials, all locally available.

Secondary reduction is indicated by dorsal cortex on flakes in this assemblage. Thirty of the flakes recovered lacked dorsal cortex, while of the remaining two, one fell in the range from 1-25%, and the other showed 100%.

No evidence of formal tool manufacture or expedient tool-use was seen in the debitage. One chert biface blank was recovered, however.

Five fragments of groundstone were recovered, four indeterminate manos and one grinding slab, all manufactured from sandstone. These fragments further support the interpretation of this area as a milling locus.

Eastern Scatter

Provenience 2 • Twenty-one lithic artifacts were recovered from the surface of this provenience. An additional two lithic artifacts were recovered from test excavations (Provenience 6). The surface artifacts included eleven groundstone fragments, six flakes, two cores, a hammerstone/chopper and a tested core. These artifacts were manufactured from sandstone (eight artifacts), intermediate granitic rock (five artifacts), quartzite (four artifacts), High Surface quartzitic sandstone (two artifacts), and basalt (two artifacts). All appear to be of locally-available materials.

Although limited in number, the debitage appears to be the result of both primary and secondary reduction. Dorsal cortex shows half the flakes lack cortex and the remaining half exhibit varying degrees of cortex. No flakes exhibit retouch on the platforms.

Other artifacts recovered were a quartzite hammerstone/chopper, two cores, and a tested core. The two cores consisted of a single platform intermediate granitic core with 1-25% cortex, and an exhausted multiplatform core of High Surface quartzitic sandstone with no cortex. The tested core was manufactured from intermediate granitic rock.

No evidence of formal tool manufacture or resharpening was evident within the provenience. There was also no evidence of expedient tool-use within this area.

Similar to Provenience 1, this provenience also appears to be a milling locus. A minimum number of 9 grinding implements were indicated by the 10 groundstone fragments. These included four slab metates, one grinding slab, one one-hand mano, and three manos of undetermined size. Eight of these fragments were manufactured from sandstone, two were of basalt, and one was of quartzite.

Provenience 6 • Subsurface tests within Provenience 2 recovered two groundstone fragments, a basin metate fragment, and an indeterminate mano. Both of these artifacts were of sandstone. The presence of these two groundstone fragments provide further support of this area being a locus for milling.

Northwest Scatter

Provenience 3 • Twenty-five lithic artifacts were recovered from the surface of this provenience. These artifacts included 16 flakes, 5 mano fragments, 4 cores, and a hammerstone/core flake. Sixty-five percent of these artifacts were manufactured from intermediate granitic rock.

Seventy-five percent of the debitage was of intermediate granitics. Dorsal cortex on the debitage indicates that both primary and secondary reduction occurred in this area.

Two multiplatform cores and one tested rock of intermediate granitics were recovered, all exhibiting high proportions of cortex (51-75% and 76-99%). This supports other evidence that primary reduction occurred in this area. One other multiplatform core of sandstone was also collected. None of these cores exhibited any evidence of secondary use as tools or grinding implements. No evidence of formal tool manufacture or expedient tool-use was present in this area.

Evidence for vegetal processing was indicated by the groundstone fragments. Four different manos were represented by the five fragments and whole pieces recovered from the area. Two of these manos were of the one-hand type and the other two were of undetermined size. Three were manufactured from quartzite and one was of sandstone. No metates were identified.

Southeast Scatter

Provenience 4 • Eight lithic artifacts were recovered from the surface of this provenience. These artifacts included five grinding implements and three flakes. The flakes were of intermediate granitic rocks and exhibited varying amounts of dorsal cortex.

The five grinding implements recovered represent a two-hand mano, a one-hand mano, two manos of undetermined size, and a slab metate. The slab metate and one unknown mano fragment are of basalt, and the remaining manos are of sandstone. The preponderance of groundstone within this area suggests this provenience may have functioned as a milling locus.

Summary

All the proveniences within this site appear to be very similar in terms of functional characteristics. Debitage characteristics indicate that secondary reduction occurred in all proveniences and primary decortication of intermediate granitic materials occurred in Provenience 3. The high frequencies of grinding implements in all proveniences indicate that vegetal processing, possibly occurring during more than one seasonal occupation, was the primary focus within the site area. There was no evidence of expedient tool-use or formal tool manufacture within the assemblages.

FA 1-5

FA 1-5 consists of a hearth, a lithic scatter, and one sherd. The sherd is Mancos Corrugated and dates ca. A.D. 900-1200. A radiocarbon sample from the hearth yielded a date of 1662 B.C. $\pm$238 (Bertram, this volume).

Thirty-three lithic artifacts were recovered from the site. These artifacts included 23 flakes, 1 piece of large angular debris, 7 cores, a flake from a battered core, and a fire spall. The majority of these artifacts were manufactured from intermediate granitic rock (22 artifacts). Four artifacts were manufactured from quartzite and three from San Juan fossiliferous chert. The remaining four artifacts represented four locally-available materials.

Scatter diagrams of lithic artifacts were plotted to identify potential activity areas. Artifact plots did not identify spatially distinct activity locations so all artifacts are reported as a single assemblage (Provenience 1). The lithic scatter measured approximately 118 m. E/W by 62 m. N/S.

Dorsal cortex and platform types indicate that both primary decortication and and secondary reduction occurred at the location. There is no evidence for formal tool manufacture. Flakes of intermediate granitic material exhibit high amounts of cortex. Other material types are low in number but still exhibit cortex. These are quartzite, San Juan fossiliferous chert, High Surface gravel, and moss jasper. Seven cores were recovered. Four were manufactured from intermediate granitic material, one from San Juan fossiliferous chert, one from High Surface fossiliferous chert, and one from Morrison light chert. The presence of cores manufactured from Morrison light chert and High Surface fossiliferous chert is problematical, due to the lack of debitage from these material categories. One hammerstone exhibited evidence of battering suggestive of use as a pecking stone. One flake also exhibited dorsal battering indicating the same type of wear.

A single flake of San Juan fossiliferous chert exhibit expedient use-wear. The flake tool had unidirectional scars and rounding indicative of scraping.

Summary

The lack of tools or evidence for tool manufacture as well as the relatively small amount of lithic material suggests a short occupation. Decortication of intermediate granitic materials is clear. Battering and expedient scraping also occurred.

FA 1-6

FA 1-6 is one of four sites in the Farmington portion of the Elena Gallegos Land Exchange that was excavated. The site is composed of a lithic and ceramic scatter with a pitstructure (Feature 3), a storage bin (Feature 4), a midden (Feature 6), and three hearth features (Features 5-8). Radiocarbon dates from several features place the occupation of the site from Basketmaker II times through Pueblo IV while ceramics date between PII and PIII (Raish, this volume). Raish argues that the site represents a location of multiple reoccupations over a long time (this volume).

A total of 682 lithic artifacts was recovered from FA 1-6. These artifacts represent a wide range of functional diversity across the site. Lithic artifacts include 578 flakes and pieces of small angular debris, 2 projectile points, 11 bifaces, 10 unifaces, 55 cores, 4 pieces of large angular debris, 1 perforator, 6 hammerstones, 10 pieces of groundstone, and 5 other artifacts.

The majority of raw materials that are represented in the lithic assemblage can be acquired locally. Obsidian that originates in the Jemez Mountains represents the only non-local raw material recovered from the site. This obsidian is also known to occur in the ancestral Rio Grande gravels south of the Jemez Mountains.

Twenty-three different material categories are represented, although the majority of lithic debris falls within 5 material groups. Forty-one percent of the assemblage was composed of intermediate granitic rock (278 artifacts). Fourteen percent of the site assemblage was manufactured from San Juan fossiliferous chert (97 artifacts), 12% was melaphyre (85 artifacts), 7% was hornfels (50 artifacts), and 5% was conchoidal silicified wood. Intermediate granitic rock and San Juan fossiliferous chert have consistently appeared as the material types most represented on sites in the study area.

The remaining material groups each made up a small percentage of the site's lithic assemblage (22% within 18 material categories). Although artifact frequencies within these categories are generally too low to provide an interpretation of reduction technology they will be discussed when artifacts provide evidence of subsistence activities at the site.

Scatter diagrams were used when possible to plot lithic artifact distributions. This technique was used to identify potential activity locations across the site. The lithic materials that were recovered from the site will be reported in three surface proveniences and a single subsurface provenience. Provenience 1 represents the main site area; Provenience 2, the northeast artifact scatter; and Provenience 3, the southern artifact scatter. Provenience 4 describes the subsurface lithic artifacts that were recovered from subsurface test excavations in the main site area.

Main Site Assemblage

The main site assemblage is described as Provenience 1 and the assemblage recovered from subsurface test excavations in this area is summarized as Provenience 4. Provenience 4 will be discussed after Provenience 1.

Provenience 1 • The main site area exhibited the densest artifact concentration. A total of 269 lithic artifacts was recovered from this area. There were 232 flakes and pieces of small angular debris, 27 cores, 2 bifaces, 2 unifaces, 1 hammerstone, 2 manos, and 1 unknown artifact. As previously discussed, the raw material variation in this assemblage is tremendous. The majority of the lithic assemblage is intermediate granitic rock (49%, 132 artifacts). This material type is followed by melaphyre (16%, 43 artifacts), San Juan fossiliferous chert (11%, 29 artifacts), and hornfels (9%, 24 artifacts). The remaining 41 artifacts represent 15 material types that can be acquired locally. No exotic materials were found in this area.

Dorsal cortex and platform data indicate that all stages of reduction and tool manufacture took place in this portion of the site. Primary decortication and secondary reduction occurred among all major material types. Flakes in the four major material type classes exhibited varying amounts of dorsal cortex on between 44% and 74% of assemblages, and cortical platforms were identified on between 16% and 61% of flakes with platforms. This clearly indicates that primary decortication occurred at the site. Evidence for formal tool manufacture occurred within the assemblage of intermediate granitic rock (five retouched platforms) and San Juan Fossiliferous chert (two retouched platforms).

Additional evidence that primary decortication occurred at the site can be found in the core data. A total of 27 cores was recovered from this area of the site; only 5 had less than 25% cortex.

The cores that were recovered from this portion of the site exhibited material type variation that is similar to the overall debitage assemblage. As would be expected, the majority of cores were manufactured from intermediate granitic rock (59%, 16 cores). Fifteen cores were multiplatform, while only five single-platform cores were recovered. Multiplatform cores indicate a more random reduction technique. A single bifacial core was also retrieved. Six tested cores indicate that raw materials were probably acquired close to the site.

Three cores exhibited secondary battering typical of use as pecking stones. Pecking stones are commonly used to prepare grinding surfaces on groundstone implements.

Although the formal tools that were recovered from Provenience 1 indicate that tools were manufactured but not necessarily used in the area, retouched platforms suggest that tool use also occurred. Two early bifaces, a uniface, and an artifact with extensive unidirectional marginal retouch were recovered. These artifacts were functionally incomplete, suggesting that they were manufacturing failures that were discarded at their location of manufacture. These artifacts lacked evidence of use. The bifaces were manufactured from Brushy Basin chert and intermediate granitic rock, while the uniface was made of San Juan fossiliferous chert. The marginally retouched artifact was made of hornfels. Unlike other areas of the site, no evidence of heat treatment was identified on these artifacts.

Flakes with retouched platforms indicate that formal tools were resharpened at the location. Four intermediate granitic flakes exhibited evidence of use on their platform/dorsal edge margins indicating that they were removed from utilized tools. This activity generally occurs at the location of use or at a retooling site. Two additional flakes with retouched platforms were manufactured from San Juan fossiliferous chert, supporting other evidence that tools were manufactured at the locale.

Evidence for extensive expedient tool-use was also identified in this area of the site. Nine flake tools were recovered from Provenience 1. These tools exhibited use-wear indicating that they were used in both cutting and scraping. Two tools exhibited multiple use edges. One tool exhibited marginal, unidirectional retouch, as well as unidirectional wear. Flake tools were manufactured from a variety of raw materials. Typically, intermediate granitic rock was used most often (four flake tools), while the remaining five tools were manufactured from quartzite, limestone, Morrison light chert, melaphyre, and San Juan fossiliferous chert.

Additional functional variation in this area is evidenced by two one-hand manos. They were manufactured from fine-grained sandstone and quartzite. Each exhibited one convex grinding surface. Two unused cobbles were also recovered.

Provenience 4 • Provenience 4 includes the subsurface artifacts recovered from the main artifact concentration (Provenience 1). Lithic artifacts totaled 227. These artifacts included 91 flakes and pieces of small angular debris, 3 unifaces, 16 cores, 2 pieces of large angular debris, 1 perforator, 5 hammerstones, 5 pieces of groundstone, and 3 unidentifiable artifacts. The raw material types represented in the subsurface assemblage were similar to material variety in the surface assemblage. Intermediate granitic rock made up 38% of the assemblage, San Juan fossiliferous chert 24%, melaphyre 10%, and hornfels 7%. The remaining portion of the assemblage represented 13 material classes, all locally available. Again, no exotic materials were recovered from this provenience.

Platform data and dorsal cortex indicate that all stages of reduction and formal tool manufacture occurred. Dorsal cortex within major material type assemblages is high, and a large number of flakes with platforms exhibit cortex. Four flakes exhibited retouched platforms suggesting that formal tool were manufactured or resharpened in the area.

Cores provide additional evidence that primary decortication occurred on the site. Of 13 cores that were recovered, only one exhibited less than 25% cortex. Equal numbers of single- and multiplatform cores were recovered from this area. Six multiplatform cores and six single-platform cores constitute the majority of the assemblage. One multiplatform core was exhausted. One additional tested core was also recovered. Raw material types of cores were similar to those of debitage in the area.

One core exhibited battering wear typical of use as a pecking stone. Evidence that grinding implements were resharpened was also found in the surface assemblage.

Formal tools and debitage in this area indicate that formal tools were manufactured and probably used. A functionally incomplete uniface of conchoidal silicified wood was recovered, suggesting that it was discarded during manufacture. Two unidirectionally retouched tools and an end scraper were also identified. Flakes with retouched platforms indicate that formal tools were manufactured and used at the location. Four flakes had retouched platforms and one exhibited wear at its platform/dorsal edge margin, indicating that a bifacial tool of intermediate granitic rock was resharpened. Although no use-wear was identified on the uniface or end scraper that were recovered, the presence of unidirectionally-retouched flake tools with wear indicating use in scraping on a hard medium, suggest that bone or wood working occurred at the location (Schutt 1982a).

Expedient flake tools exhibit evidence of both cutting and scraping, also similar to the surface assemblage. Seven flake tools showed evidence of such use; two of these exhibited several used edges each.

Five pieces of groundstone were also identified in this assemblage. Three of these fragments may belong to one trough metate which was manufactured from fine-grained sandstone. A mano and an axe/maul were manufactured from intermediate granitic rock. Three unaltered cobbles were also recovered.

Northeast Artifact Scatter

Provenience 2 • Provenience 2 represents the surface artifacts that were recovered from the northeast lithic scatter. A total of 90 lithic artifacts was recovered from this area. There are 77 flakes, 12 cores, and 1 piece of groundstone. This portion of the site exhibited considerably less material-type variation than other areas of the site. The majority of these artifacts were manufactured from intermediate granitic rock (67%, 60 artifacts). This material is followed in frequency by melaphyre (20%, 18 artifacts), and hornfels (10%, 9 artifacts). Unlike the assemblages previously described, San Juan fossiliferous chert was not well represented in this area (one flake). The two remaining flakes were manufactured from quartzite and sandstone.

Dorsal cortex and platform data indicate that primary decortication occurred in this area. Although a few flakes lack dorsal cortex (13%, 10 flakes), a large majority exhibit cortex (90%, 65 flakes). Additional evidence for primary decortication can be found in platform data. Cortex was identified on 78% of flakes with platform (54 flakes).

Eleven cores were identified in this assemblage. These included five multiplatform cores, five single platform cores, and a single bifacial core. No exhausted cores were recovered. Raw material diversity among cores in this area is similar to the material diversity among debitage in the area. Intermediate igneous cores constitute 45% of the assemblage (5 cores) while melaphyre cores represent 36% (4 cores). Two cores were manufactured from hornfels. The melaphyre core exhibited secondary use that indicates it was used as a chopper. This is the only chipped stone artifact that exhibited evidence of use in this area.

Minimal evidence for formal tool manufacture was recovered. Although no formal tools were recovered from this provenience two flakes with retouched platforms suggest that bifacial manufacture may have occurred. Unlike Provenience 1, these flakes lacked evidence of use. No expedient flake tools were recovered from this area.

Two pieces of groundstone were also recovered from this area. A one-hand mano was manufactured from course grained sandstone and a ground axe was manufactured from intermediate granitic rock.

Southern Artifact Scatter

Provenience 3 • Provenience 3 represents the artifact scatter to the south of the main site artifact concentration. Lithic artifacts included 78 flakes and pieces of small angular debris, 2 projectile points, 11 bifaces, 1 core, and 1 other artifact. The material-type variation in this area is unlike any other part of the site. Silicified wood comprises the vast majority of the assemblage. conchoidal silicified wood makes up 28% of the assemblage (27 artifacts), while yellow silicified wood represents 13% (13 artifacts). San Juan fossiliferous chert comprises 12% of the assemblage (12 artifacts). The remaining 36 artifacts were manufactured from 13 different material classes. All materials can be found locally with the exception of Jemez Obsidian. Seven artifacts were manufactured from obsidian that occurs in the Jemez Mountains or ancestral Rio Grande gravels south of those mountains.

Evidence that provides information about reduction and tool manufacture also indicate that it is unlike other assemblages on the site. The debitage recovered from this area indicate that it is a tool manufacturing locale. Eighty-three percent of this assemblage lacks dorsal cortex. Unlike other areas of the site, where primary reduction occurred, only a single core was recovered. These data suggest that decortication occurred at another location.

Seven flakes with retouched platforms support data from tools which indicate formal tools were manufactured and used in the area. These flakes were manufactured from the same raw materials that formal tools were manufactured from. For the most part these flakes lacked evidence of use on platform/dorsal edge margins that would indicate resharpening, but one flake, manufactured from conchoidal silicified wood exhibited use on its' platform, indicating that a bifacial tool was resharpened in the area.

A total of 13 formal tools was recovered from this provenience. Artifact morphology suggest that formal tools were manufactured and used at this location. Nine bifaces represent early stages of tool manufacture. These artifacts include a bifacial blank which was manufactured from silicified wood, and seven early bifaces which were manufactured from conchoidal silicified wood (two artifacts), quartzitic sandstone (two artifacts), yellow silicified wood (one artifact), San Juan fossiliferous chert (one artifact), and moss jasper (one artifact). One late biface of Jemez obsidian was also recovered. These bifaces represent manufacturing failures that were discarded during manufacture due to breakage. Two functionally complete bifacial tools indicate that tool use probably occurred at the location. They were manufactured from Morrison light chert and conchoidal silicified wood. One artifact, manufactured from conchoidal silicified wood, exhibited extensive marginal retouch and unidirectional wear patterns indicating use as a scraper on a soft medium. This type of wear typically results from hide working, and is characterized by a broad, unidirectionally-rounded, convex edge, and rounded shoulders (Schutt 1980).

Two projectile points were also recovered. A late Archaic En Medio point was manufactured from Polvadera Peak obsidian. Overall morphology suggested that the tool was broken before manufacture was complete. Generally these artifacts are discarded at their location of manufacture. The second projectile point was also late Archaic. This artifact was functionally complete but exhibited evidence of reworking.

The minimal use of heat-treated raw materials for bifacial tools is unusual for a site where large numbers of tools were manufactured. Of 14 tools, 6 exhibited successful heat treatment. None of the artifacts exhibited unsuccessful heat treatment. The lack of unsuccessfully heat-treated artifacts in an assemblage this size suggests that heat-treating occurred at another location. Usually a number of artifacts exhibit evidence of unsuccessful heating at locations where this activity is carried out.

The use of expedient flake tools in scraping and cutting is also evident in this area. Ten flake tools were recovered; five were used in cutting and five were used as scrapers. Flake tools were manufactured from yellow silicified wood, conchoidal silicified wood, San Juan fossiliferous chert, mottled Morrison chert, High Surface chert, and moss jasper.

No evidence of vegetal processing was recovered.

Summary

The lithic artifacts that were recovered from Provenience 1 in the main site area and Provenience 4, the subsurface in that area, show considerable technological and functional variation. Material type and artifact type variety are similar in both assemblages suggesting, that they represent the same occupation. Debitage indicates that all stages of reduction and formal tool manufacture were carried out at the location. Tool types indicate that expedient flake tools were used for both cutting and scraping; retouched platforms suggest that formal tools were resharpened. Other functions represented in the area are vegetal processing, and resharpening groundstone implements.

The lithic assemblage that was recovered from the northeast artifact scatter (Provenience 2) is clearly different from the main artifact scatter. Debitage indicates a strong emphasis on primary decortication, although limited evidence of formal tool manufacture is present. The only evidence of activities in this area came from three items: a core that was used as a chopper, a mano, and a ground axe. No formal or expedient tools were recovered.

The southern lithic assemblage on FA 1-6 is clearly different from the other two artifact scatters on the site. This area exhibits primarily silicified woods instead of intermediate igneous rock, and the assemblage is characteristic of tool manufacturing and use. There is no evidence of primary reduction in this portion of the site. Formal and expedient tools indicate that both scraping and cutting were performed. Hide working is also indicated. No evidence of vegetal processing was found.

The basic differences among the spatially discrete lithic assemblages recovered from FA 1-6 support arguments presented by Raish (this volume) that this site was reoccupied through time.

FA 1-9

FA 1-9 consists of a series of sparse lithic scatters which appear in blowouts. No cultural features were associated with these artifacts, and no subsurface artifacts were recovered.

A total of 43 lithics was recovered from the site. These artifacts included 37 flakes, 4 bifaces, 1 core, and an anvil stone. Unlike most sites in the study area, the majority of these artifacts were manufactured from gray Morrison chert (25%, 11 artifacts), and quartzitic sandstone (21%, 9 artifacts). High surface cherts made up 14% of the assemblage (6 artifacts). Only two artifacts were manufactured from intermediate granitic rock, common on sites in the area. Four artifacts were manufactured from obsidian that is known to originate in the Jemez Mountains and the Rio Grande gravels below the Jemez Mountains. The remaining twelve artifacts represented seven additional local material categories.

Artifacts were recovered from three locations within coppice dunes. These artifact distributions probably reflect geomorphic blowout processes, or windows in the site, rather than cultural activity locations (Schutt and Chapman 1988). Artifacts will be described within these three locations, which are labeled Provenience 1 (Locus 1), Provenience 2 (Locus 2), and Provenience 3 (Locus 3).

Site Assemblage

Provenience 1 • The densest lithic artifacts (26 artifacts) occurred in Provenience 1, in the central portion of the site. These artifacts included 22 flakes, an anvil stone, and three bifaces. Material type variation within this area is not representative of the entire site. This area contained lithics primarily manufactured from locally-available materials. Gray Morrison chert (10 artifacts) and quartzitic sandstone (9 artifacts) made up most of the assemblage (93%). A single biface blank was manufactured from Polvadera Peak Obsidian, which does not originate in the area. Six additional artifacts were manufactured from a variety of local cherts.

The overall assemblage is more characteristic of secondary reduction and formal tool manufacture than primary decortication. The majority of flakes recovered from this provenience generally lacked cortex (81%), and most (91%) did not exhibit cortical platforms. Only four flakes exhibited any dorsal cortex. It would appear that the gray Morrison chert was brought to the site as either prepared cores or bifacial blanks. There is no evidence that this material underwent decortication at the site.

Platform data on flakes manufactured from gray Morrison chert indicate that a biface was resharpened at this location, although no tool of this type was recovered. Four flakes of this material exhibited retouched platforms and two of these platforms were ground and utilized, indicating that they were removed from a utilized bifacial tool during resharpening.

Three additional formal tools were also recovered from this location. All were fragments of bifacial blanks representing early stages of biface manufacture. Two of these artifacts were manufactured from quartzitic sandstone, and one from Polvadera obsidian. Although platform data do not suggest that the quartzitic sandstone bifaces were manufactured at the site, an obsidian flake with a retouched platform was recovered from Provenience 2, suggesting that this artifact may have been manufactured at the site. The fact that these artifacts occur in the assemblage suggest that they were discarded due to breakage during manufacture.

Additional evidence for functional diversity at this location can be seen by examining use-wear on flakes in the assemblage. Three flakes exhibited wear patterns indicating use in both scraping and cutting. A retouched quartzite flake exhibited bidirectional scars and rounding, reflecting use as a knife. Two flakes manufactured from gray Morrison chert exhibit unidirectional and bidirectional rounding, respectively, indicating that they were used in both cutting and scraping.

Although no groundstone was recovered from this provenience, a cobble anvil stone was identified in the central portion of the area.

Provenience 2 • Eleven lithic artifacts were recovered from Provenience 2. These included nine flakes, a biface, and a core. The flakes were manufactured from a variety of materials, a number of which do not occur in Provenience 1. This assemblage consisted of flakes manufactured from conchoidal wood (three flakes), High Surface chert (two flakes), Polvadera Peak obsidian (two flakes), Jemez obsidian (one flake), palm wood (one flake), gray Morrison chert (one flake), and intermediate granitic rock (one flake). The nearest known source for the obsidian flakes is the Jemez Mountains in central New Mexico.

The relatively low artifact count in this area of the site limits interpretation of reduction. No cortical platforms were identified in this assemblage. Two flakes exhibited retouched platforms indicating that formal tool manufacture occurred in the area. These platforms were on flakes of Polvadera and Jemez obsidian. It is likely that these flakes were removed from the biface that was recovered from Provenience 1. It was not possible to determine if these flakes were removed from a utilized tool.

Two additional artifacts indicate that more varied activities occurred in the area. A single bifacial blank was manufactured from silicified palm wood that was successfully heat-treated, and an expedient flake tool exhibits evidence of scraping. Similar activities occurred in Provenience 1.

Provenience 3 • Six flakes were recovered from the easternmost provenience on the site. Most of these were manufactured from High Surface chert (four artifacts). The remaining two flakes were manufactured from fossiliferous chert and intermediate granitic rock.

Although there was no evidence of formal tool manufacture or use in this area, a single flake with unidirectional use scars suggests scraping.

Summary

The chipped stone assemblage that was recovered from FA 1-9 indicates considerable functional diversity, although few artifacts were found. Debitage suggests that both expedient and formal tools were manufactured and used at the location for cutting and scraping. Although similar debitage was found in all areas of the site, there appear to be some differences in material types from provenience to provenience, which may represent discrete activity locations.

FA 1-10

FA 1-10 is a low-density lithic scatter with an ash stain, a concentration of burned rock, and groundstone fragments. It dates between A.D. 700 and 1350 (Bertram, this volume).

Twenty-four lithic artifacts were recovered from the site. These include 16 flakes (1 bipolar), 4 mano fragments, 1 metate fragment, a core, 1 retouched flake, and a piece of small angular debris. Artifacts were manufactured from 13 different locally-available raw materials. These included Morrison light chert (four artifacts), quartzite (three artifacts), San Juan fossiliferous chert (three artifacts), conchoidal wood (two artifacts), other chert (two artifacts), sandstone (two artifacts), and High Surface quartzitic sandstone (two artifacts). An additional six artifacts were manufactured from six different material types.

Two discrete activity loci were mapped for this site. Locus 1 covered an area measuring 17 m. N/S by 8 m. E/W, and consisted of a low-density surface scatter (Provenience 1) and an ash stain (Feature 1). Artifacts recovered from a test unit placed in this feature are described in Provenience 4. Locus 2, measuring 21 m. E/W by 15 m. N/S, encompassed a burned rock concentration (Feature 2) surrounded by a low-density surface lithic scatter (Provenience 2). Provenience 3 represents subsurface artifacts recovered from test excavations in this locus, and Provenience 5 represents artifacts recovered from a test unit placed within Feature 2.

Locus 1 Assemblage

Provenience 1 • Eight lithic artifacts were recovered from the surface in Locus 1. These artifacts included six flakes (one bipolar), one core, and one mano. The artifacts were manufactured from Morrison light chert (three artifacts), San Juan fossiliferous chert (two artifacts), conchoidal wood (one artifact), High Surface gravels (one artifact), and quartzite (one artifact).

Although few in number, dorsal cortex and platform types suggest that both primary and secondary reduction occurred in this area. Dorsal cortex and cortical platforms indicate decortication of locally-available materials.

Additional artifacts recovered from this area include an exhausted multiplatform core of conchoidal wood, and a quartzite mano fragment. It was not possible to determine if the fragment represented a one- or two-hand grinding implement. The presence of the mano suggests that grinding may have occurred within this locus.

Provenience 4 • Two lithic artifacts were recovered from a test unit placed within the ash stain, a flake and a piece of small angular degris. The flake, manufactured from Morrison light chert, exhibited no dorsal cortex but had a cortical platform. The piece of small angular debris was of conchoidal wood.

Locus 2 Assemblage

Provenience 2 • Twelve lithic artifacts were recovered from the surface in Locus 2. These artifacts include seven flakes, three manos, one metate, and one retouched flake. Nine different raw materials were used in the manufacture of these artifacts: quartzite (two artifacts), sandstone (two artifacts), High Surface quartzitic sandstone (two artifacts), yellow wood (one artifact), San Juan fossiliferous chert (one artifact), undifferentiated black chert (one artifact), other chert (one artifact), moss jasper (one artifact), and hornfels (one artifact).

All of the debitage except one piece lacked dorsal cortex. Two of the flakes had cortical platforms, with the remainder having simple platforms. Although the counts are low, the data suggest that secondary reduction occurred within this locus. No evidence of formal tool manufacture was identified.

This area also exhibited evidence for expedient tool-use. One flake of other chert had unidirectional scarring and rounding, indicative of scraping. Cutting is also indicated by the wear patterns on a retouched flake tool manufactured from High Surface quartzitic sandstone. This artifact exhibited bidirectional scars and rounding, indicating use in cutting.

Other artifacts recovered include three mano fragments and one slab metate fragment. Two of the manos are of quartzite and one is of sandstone. These fragments represent two one-hand manos and an unknown mano. The slab metate was manufactured from sandstone. The presence of these grinding implements indicates vegetal proccessing within this locus.

Provenience 3 • A single flake, manufactured from other chert, was recovered from the subsurface tests. This flake lacked dorsal cortex and exhibited a single-faceted platform.

Provenience 5 • A test unit was placed within Feature 2 (rock concentration). One flake was recovered from this unit. Manufactured from High Surface fossiliferous chert, this flake lacked dorsal cortex and had a single-facet platform.

Summary

Although limited in number, the lithic assemblage recovered from site FA 1-10 indicates that a wide range of activities occurred within the two discrete loci. Both primary and secondary reduction are indicated for both areas. Both freehand and bipolar techniques were utilized. Groundstone present within both loci suggests that vegetal processing may have also occurred at the site. Evidence for expedient tool-use in Locus 2 indicates that cutting and scraping occurred at the location. There is no evidence that formal tools were manufactured at the site.

FA 2-6

FA 2-6 is composed of a lithic scatter (FA 2-6A) and a scatter of lithics, ceramics, and a hearth (FA 2-6B). A radiocarbon date from the hearth places its use at ca. 23 B.C. ± 353 (Bertram, this volume). This date is inconsistent with ceramics that were recovered from the provenience (Raish, this volume). There were no dates recovered from the lithic scatter.

A total of 44 lithic artifacts was recovered from the site. These artifacts included 38 flakes, 4 cores, a chopper, and an unmodified cobble. The majority of these artifacts were manufactured from intermediate granitic rock (60%, 26 artifacts) and Morrison light chert (23%, 10 artifacts). The remaining seven artifacts were manufactured from four locally-available materials.

Scatter diagrams were generated to plot lithic artifacts across the site. These diagrams defined two surface proveniences, which correspond to parts of the site that had previously been defined as Area A (Provenience 1) and Area B (Provenience 2) (Bertram, this volume). Lithic artifacts will be reported in the western artifact scatter (Provenience 1), the eastern artifact scatter (Provenience 2), and the subsurface excavations in the eastern scatter (Provenience 3).

Western Artifact Scatter

Provenience 1 • Thirty-four lithic artifacts were recovered from this portion of the site. These artifacts include 33 flakes and 1 core. The majority of these were manufactured from intermediate granitic rock (56%, 19 artifacts), and Morrison light chert (29%, 10 artifacts). The remaining five artifacts were manufactured from two locally-available materials.

Dorsal cortex and platform data suggest that primary decortication of intermediate granitics and Morrison light chert occurred at the location. Cortex was identified on 93% of the flakes found in this area; a large number of flakes exhibited cortical platforms (38%). A single multiplatform core of Morrison light chert exhibited high percentages of cortex (51-75%), supporting other evidence that the location represents a primary reduction area. There is no evidence that tools were manufactured or used at the location.

Eastern Artifact Scatter

Provenience 2 • Only nine lithic artifacts were recovered from the eastern artifact scatter. These included five flakes, three cores, and one chopping tool. These artifacts were primarily manufactured from intermediate granitic rock (78%, 7 artifacts). A silicified wood flake and a quartzite flake were also recovered.

The debitage in this portion of the site exhibited high percentages of cortex; however, the low artifact counts prohibit interpretation. Three cores, two of intermediate granitic and one of quartzite, were also recovered. These artifacts were multiplatform, single platform, and tested cores. Although counts are extremely low, this assemblage is similar to debitage found in Provenience 1; primary decortication is indicated.

The only other evidence for activities within this provenience comes from a chopping tool that was manufactured from intermediate granitic rock. No other lithic artifacts were recovered.

Provenience 3 • A single unmodified cobble was recovered from the subsurface test in this provenience.

Summary

The lithic materials that were recovered from the site indicate a restricted primary reduction location. Although a single chopping tool was found in Provenience 2, all other debitage indicates primary decortication.

FA 2-7

FA 2-7 consists of a lithic and ceramic scatter and a hearth. No radiocarbon date was obtained from the hearth. Ceramics recovered from Proviences 1 and 2 indicate primary occupation during the Pueblo III (PIII) period, with occasional use during the PII and PIV periods (Raisch, this volume).

A total of 126 lithic artifacts was recovered from this site. These artifacts included 91 flakes (2 bipolar), 19 cores, 6 tested rocks, 2 retouched rocks, a hammerstone, a metate, a grooved maul, an axe, and a piece of large angular debris. One unmodified rock was also recovered. The majority of artifacts were manufactured from intermediate granitic rock (60%, 75 artifacts) and melaphyre (14%, 18 artifacts). The remaining artifacts were made of quartzite (eight artifacts), yellow wood (seven artifacts), and hornfels (six artifacts); all are locally available. An additional eleven artifacts were manufactured from six different locally-available materials.

Scatter diagrams of lithic artifacts were plotted to identify potential activity areas. These plots defined four spatially discrete surface lithic scatters. Provenience 1, located in the northeast quadrant of the site, consists of a sparse scatter measuring 105 m. E/W by 60 m. N/S. The three other proveniences are situated in the southwest quarter of the site. Provenience 2 encompasses an area measuring 50 m. E/W by 45 m. N/S. Provenience 3, situated to the southeast of Provenience 2, covers an area 60 m. N/S by 45 m. E/W. Provenience 4, northwest of Provenience 2, measures 45 m. N/S by 30 m. E/W. Subsurface tests were placed in each provenience. Lithic artifacts were recovered from tests within Proveniences 1 and 4. These assemblages are described in Provenience 5 and 6, respectively. The lithic assemblages are described by provenience below.

Northeast Artifact Scatter

Provenience 1 • Thirty-six lithic artifacts were recovered from the surface within this provenience. Five additional artifacts were found in subsurface test excavations (Provenience 5). Surface artifacts included 28 flakes (2 bipolar) and 8 cores. Sixty-one percent of these artifacts were manufactured from intermediate granitic rock (22 artifacts). Other material types include melaphyre (three artifacts), quartzite (three artifacts), hornfels (two artifacts), High Surface quartzitic sandstone (two artifacts), yellow wood (two artifacts), and one artifact each from San Juan fossiliferous chert and sandstone.

Dorsal cortex and platform type suggest that both primary and secondary reduction occurred in this area. The amounts of dorsal cortex and cortical platforms indicate decortication of locally-available materials.

Seven cores and one tested rock with fairly high amounts of cortex were found at this location. The tested rock of melaphyre appears to indicate that this raw material occurs close by, as this type of artifact typically occurs at material-acquisition loci. The seven cores represent three material types: intermediate granitic rock (five cores), melaphyre (one core), and sandstone (one core). None of these cores exhibited any form of secondary use. The two bipolar flakes recovered from the provenience suggest that small nodules were reduced.

Although no evidence of formal tool manufacture or use was recovered, expedient tool-use is indicated. A single flake exhibited bidirectional wear, indicating cutting.

Provenience 5 • Five flakes were recovered from subsurface tests within this area. Four flakes were manufactured from yellow wood and one of palm wood. Four of these flakes lacked dorsal cortex while the fifth flake exhibited dorsal cortex ranging from 26 - 50%. Although limited in number, the high percentage of flakes lacking dorsal cortex and exhibiting both single faceted and collapsed platforms suggests secondary reduction. A single flake of yellow wood exhibited a retouched platform, suggesting that a formal tool was manufactured or resharpened in the area. No evidence of use was identified on the platform.

Southwestern Artifact Scatters

Provenience 2 • Twenty-six artrifacts were recovered from the surface of this provenience. Test units placed within this area did not recover any subsurface artifacts. The surface artifacts included 21 flakes, 3 cores, 1 metate, and 1 piece of large angular debris. The majority of these artifacts were manufactured from intermediate granitic rock (58%, 15 artifacts) and melaphyre (23%, 6 artifacts). The remaining five artifacts are of four locally-available raw materials.

Debitage from this area is characteristic of primary decortication and secondary reduction. Only 19 percent of the debitage lacked dorsal cortex. Seventy-eight percent of the platforms were cortical.

Three cores were also recovered from this area. These cores exhibited varying degrees of cortex ranging from 1-25% to 51-75%, which reinforces the other evidence that primary decortication occurred in this area. Two of these cores were of intermediate granitic rock and one was of San Juan fossiliferous chert. None of these cores exhibited any form of secondary use. Neither evidence of formal tool manufacture or use, nor evidence of expedient tool-use, was noted.

This area also exhibited evidence for vegetal processing. A fragment of a course-grained sandstone metate was recovered.

Provenience 3 • Twenty-nine lithic artifacts were recovered from the surface of this provenience. As with Provenience 2, no artifacts were recovered from the test units placed within this area. The surface artifacts included 14 flakes, 5 tested cores, 3 cores, a hammerstone, a grooved maul, an axe, a core/hammerstone, and an anvil stone. One retouched rock and one unmodified rock were also recovered. Most of these artifacts (82%) were manufactured from intermediate granitic rock (23 artifacts). The remaining artifacts were of melaphyre (two artifacts), Morrison light chert (one artifact), Brushy Basin chert (one artifact), and quartzite (one artifact).

Dorsal cortex and platform types suggest that both primary and secondary reduction occurred within this provenience. The amounts of dorsal cortex (80%) and of cortical platforms (42%) indicate decortication of intermediate granitic materials.

The majority of cores recovered from this area was manufactured from intermediate granitic rock. Three cores and five tested cores exhibited high percentages of cortex, supporting other evidence that decortication of intermediate granitic rock occurred at this location. None of these cores exhibited any form of secondary use. One core of Brushy Basin chert exhibited battering wear indicating use as a hammerstone. No evidence of formal tool manufacture or use was present in this area.

Other artifacts recovered from this provenience suggest that a variety of activities may have occurred at the site. These artifacts include a grooved maul, an axe, a hammerstone, and an anvil stone. All these artifacts were manufactured from intermediate granitic rock. No evidence of vegetal processing is evident at this location.

Provenience 4 • A total of 23 lithic artifacts was recovered from the surface of this provenience. Test excavations within this provenience also recovered one additional lithic artifact (Provenience 6). The surface artifacts included 18 flakes, 3 cores, an anvil stone, and a retouched rock. Most of these artifacts were manufactured from intermediate granitic rock (13 artifacts) and melaphyre (7 artifacts). The remaining three artifacts were of quartzite (two artifacts) and San Juan fossiliferous chert (one artifact).

Dorsal cortex and platform type indicate that both primary decortication and secondary reduction occurred within this provenience. Sixty percent of the flakes exhibited cortical platforms, and 70% of the debitage exhibiting varying degrees of dorsal cortex.

Other artifacts from this area include an intermediate granitic anvil stone and three cores. The cores were manufactured from quartzite (two cores) and intermediate granitic rock (one core). All cores exhibited a high percentage of cortex (51-75% and 76-99%). None of these cores had evidence of secondary use.

A single flake of melaphyre exhibited a retouched platform suggesting that a formal tool was manufactured or resharpened in the area, although no formal tools were recovered. It was not possible to identify use or preparation on this platform, and therefore not possible to distinguish manufacture from resharpening.

No evidence of expedient tool-use was present in this area. There was also no evidence of vegetal processing.

Provenience 6 • One flake was recovered from the test excavations within this location. The flake was of intermediate granitic rock, lacked dorsal cortex and had a cortical platform.

Summary

Ceramic artifacts from this site suggest more than one occupational episode. Lithic artifacts recovered from the site indicate that a variety of activities occurred within the different proveniences. Primary decortication and secondary reduction of locally-available raw materials occurred throughout the site area. Both freehand and bipolar techniques were used. Although no formal tools were recovered, the presence of two flakes with retouched platforms, one in Provenience 4 and one in Provenience 5, suggests that a formal tool may have been manufactured or resharpened in these areas. Evidence of vegetal processing was present in Provenience 2. Expedient tool-use, indicating cutting, was evident in Provenience 1.

FA 2-8

FA 2-8 is a multicomponent Archaic, Anasazi, and Navajo site with several occupation loci. The site consists of an extensive scatter of lithics and ceramics. Five hearths yielded radiocarbon dates. Feature 1 had a date of A.D. 525 ± 510. Feature 2 gave dates of A.D. 755 ± 135, A.D. 838 ± 208, and A.D. 1350 ± 65. Feature 3 consisted of two hearth pits and a dark ash stain. Two dates were recovered: 82 B.C. ± 298 and A.D. 765 ± 135. Feature 4 yielded a date of A.D. 235 ± 180 (Bertram, this volume). Ceramics recovered (Raish, this volume) were sherds of Piedra Brown (A.D. 700 - 950) and Rosa Brown (A.D. 600 - 750).

A total of 140 lithic artifacts was recovered from the site. These artifacts included 116 flakes, 7 cores, 3 bifaces, 3 pieces of small angular debris, one axe, a hammerstone, one preform, a wedge, a projectile point, a retouched flake, and a uniface. Four fire spalls were also recovered. The majority of artifacts were manufactured from intermediate granitics (43 artifacts), yellow wood (28 artifacts), Morrison light chert (25 artifacts) and San Juan fossiliferous chert (18 artifacts). Other material types include High Surface quartzitic sandstone (ten artifacts), conchoidal wood (four artifacts), splintered wood (two artifacts), High Surface fossiliferous (three artifacts) hornfels (two artifacts), and quartzite (two artifacts). Three additional artifacts were manufactured from three different locally-available materials.

Scatter diagrams of lithic artifacts were plotted to identify potential activity areas. These plots defined four spatially discrete loci within the site area. Provenience 1, located in the center of the site, covers an area measuring 55 m. N/S by 45 m. E/W. Features 1, 2 and 3 were situated in this provenience. Provenience 2, located 25 m south of Provenience 1, consists of a moderately dense scatter of artifacts covering an area 75 m. E/W by 37 m. N/S. Provenience 3 is situated northwest of Provenience 2 and consists of a low-density artifact scatter measuring ca. 50 m. E/W by 40 m. N/S. Feature 4 was within this provenience. Provenience 4, situated in the northwest portion of the site, covers an area measuring 85 m. E/W by 55 m. N/S. Test excavations were placed in Proveniences 1, 2, and 3. Subsurface artifacts were recovered from Provenience 1 only. These artifacts were designated Provenience 5. The lithic assemblage is described by provenience below.

Center of Site

Provenience 1 • Thirty-six lithic artifacts were recovered from the surface of this area. An additional 24 lithic artifacts were recovered from test excavations (Provenience 5). The surface artifacts included 27 flakes, 2 bifaces, 2 pieces of small angular debris, 1 preform, and 1 core. Three fire spalls were also recovered. The majority of artifacts were manufactured from yellow wood (19 artifacts), San Juan fossiliferous chert (6 artifacts), and High Surface quartzitic sandstone (4 artifacts). The remaining seven artifacts were made from six different locally-available materials.

Dorsal cortex and platform type indicate secondary reduction. Ninety-two percent of the debitage lacked dorsal cortex (25 flakes) and 47% exhibited single facet platforms. It would appear that decortication occurred elsewhere.

One multiplatform core made from Morrison light chert was recovered. The core exhibited cortex ranging from 1-15%. No secondary use as a tool or grinding implement was evident on this core.

Eleven flakes also exhibited retouched platforms, suggesting formal tools were manufactured or resharpened in this area. Two of these were utilized, suggesting resharpening. Five of these flakes were of yellow wood, three of High Surface quartzitic sandstone, and one each of conchoidal wood, intermediate granitics, and San Juan fossiliferous chert. Formal tools recovered included a yellow wood early biface fragment, a late biface fragment of High Surface quartzitic sandstone, and a fragment of an Anasazi-style projectile point manufactured from High Surface quartzitic sandstone. No formal tools manufactured from conchoidal wood, intermediate granitics, or San Juan fossiliferous were recovered, suggesting that these items may have been carried away.

This area also exhibited evidence for expedient tool-use. Two flakes of yellow wood had bidirectional scars, suggesting cutting. Two flakes, one of yellow wood and one of conchoidal wood, exhibited unidirectional scars and rounding, suggesting scraping.

Other artifacts recovered from this provenience included two small pieces of angular debris and one preform. The preform was manufactured from High Surface quartzitic sandstone. There was no evidence that vegetal processing occurred within this provenience.

Provenience 5 • The assemblage from this provenience represents those artifacts recovered from subsurface test excavations within Provenience 1. A total of 24 lithic artifacts was recovered from these subsurface tests. These artifacts include 20 flakes, 1 uniface, 1 biface, and 1 hammerstone. One fire spall was also recovered. Raw material types include yellow wood (nine artifacts), San Juan fossiliferous chert (eight artifacts), conchoidal wood (three artifacts), splintered wood (two artifacts), High Surface fossiliferous (one artifact), and intermediate granitic (one artifact).

Dorsal cortex and platform type are similar to the surface assemblage. Debitage characteristics indicate secondary reduction.

A single flake of yellow wood exhibited a retouched platform, suggesting that a formal tool was manufactured or resharpened in this area. An early stage biface of this material had been recovered in the surface assemblage.

Formal tools recovered from the subsurface testing include 'a functionally coomplete uniface fragment and a Navajo-style projectile point manufactured from San Juan fossiliferous chert. This latter tool exhibited successful heat treatment. A flake of San Juan fossiliferous chert with a retouched platform had been recovered in the surface assemblage.

Other subsurface artifacts recovered were a fire spall and an intermediate granitic hammerstone. There was no evidence of expedient tool-use within this assemblage, nor any evidence of vegetal processing.

Both the surface and subsurface assemblages within this area indicate that secondary reduction and some formal tool manufacture occurred here. There was also some expedient tool-use, suggesting both cutting and scraping.

Southern Portion of the Site

Provenience 2 • Forty-eight lithic artifacts were recovered from the surface of this provenience. These artifacts included 46 flakes, an axe, and a core. The majority were manufactured from intermediate granitics (32 artifacts). Other material types included Morrison light chert (ten artifacts), San Juan fossiliferous (two artifacts), and one artifact each from High Surface fossiliferous, other igneous, and sandstone.

Debitage characteristics indicate secondary reduction. Sixty-one percent of the debitage lacked dorsal cortex and eighty percent of the flakes exhibited single facet platforms. Although limited, evidence from dorsal cortex and platform data indicate that some primary reduction also occurred within this provenience.

A multiplatform core was also recovered. The core was manufactured from hornfels, and had cortex in the 51-

75% range. No evidence of secondary use as a tool or grinding implement was evident on this core.

Six flakes had retouched platforms, suggesting that formal tools had been manufactured or resharpened in this area. It was not possible to identify use or preparation on these platforms, and therefore not possible to distinguish manufacture from resharpening. Three of these flakes were of intermediate granitics and three were made from Morrison light chert. No formal tools were recovered within this provenience, suggesting that they may have been carried away.

Additional functional diversity is indicated by a basalt axe. No evidence of expedient tool-use was present within this area. Also lacking was evidence for vegetal processing.

West/Southwest Portion of the Site

Provenience 3 • A total of 27 lithic artifacts was recovered from the surface of this provenience. These artifacts included 23 flakes, 3 cores, and one piece of small angular debris. Most of the artifacts were manufactured from Morrison light chert (14 artifacts), and High Surface quartzitic sandstone (6 artifacts). Four of the remaining artifacts were of intermediate granitics, two were made from San Juan fossiliferous chert, and the remaining one was of sandstone.

Dorsal cortex and platform type indicate mainly secondary reduction. Sixty-nine percent of the debitage lacked dorsal cortex, while 80 percent had single-facet platforms.

Three cores were recovered from this area, two multiplatform and one tested. All were of High Surface quartzitic sandstone and exhibited small proportions of cortex (1-25% and 26-50%). No evidence of secondary use was present on these cores.

A single flake of High Surface quartzitic sandstone exhibited a retouched platform, suggesting that a formal tool was either manufactured or resharpened in this area. No formal tools were recovered from this provenience, suggesting that it may have been carried away.

Like Provenience 2, this area had no evidence of expedient tool-use or evidence of vegetal processing. Functional diversity within this area appears more limited than in the previously-discussed proveniences.

Northwest Portion of the Site

Provenience 4 • Five lithic artifacts were recovered from the surface of this provenience. These artifacts included two flakes, two cores, and a wedge. Four of these artifacts were manufactured from intermediate granitics and one was of quartzite.

Both flakes were manufactured from intermediate granitics and had cortex in the 1-25% range. A single-facet platform was recorded on one the flakes.

The two cores recovered were both multiplatform regular cores of High Surface quartzitic sandstone. One had cortex ranging from 1-25% and the other had cortex of 26-50%. Neither core exhibited evidence of secondary use as tools or grinding implements.

The remaining artifact was a quartzite wedge. Wedges are small, wedge-shaped tools that exhibit battering on either end. These tools have been found useful in splitting bone for the manufacture of bone tools (Schutt 1980). These tools have also been identified at sites in Chaco Canyon and wear patterns may reflect use in splitting sedimentary rocks along planes, for the manufacture of building elements (Schutt 1986). Further experimentation is necessary before it is possible to determine how these tools were used.

Summary

Functional variation among the proveniences appears to be limited. All proveniences exhibited secondary reduction; there was also some decortication of raw materials in Provenience 2. Evidence for formal tool manufacture or resharpening is present in all proveniences except Provenience 4. This activity was greatest in Provenience 1. Provenience 1 also exhibited evidence of expedient tool-use. Use-wear patterns on four flakes show evidence of both cutting and scraping. No evidence of vegetal processing was found in any of the proveniences. Radiocarbon dates obtained from the hearth features indicate use of the area from the Archaic to the Anasazi periods.

FA 2-9

FA 2-9 consists of a lithic scatter and two ash stains. A single gray plainware sherd was also recovered. No dates were recorded for the site.

A total of 95 lithic artifacts was collected from the surface of the site. These artifacts included 65 flakes, 19 cores, 1 biface, 2 scrapers, 3 wedges, and 1 mano. Material type diversity is similar to other sites in the area. Seventy-six percent of these artifacts were manufactured from intermediate granitic materials (72 artifacts). This is consistent with many sites in the area. Other materials include Brushy Basin chert (nine artifacts), melaphyre (nine artifacts), and quartzite (three artifacts). Two additional artifacts were manufactured from High Surface chert and other chert. All these materials may occur locally.

Scatter diagrams were used to plot lithic artifacts to aid in identifying activity locations. These plots defined one lithic concentration (Provenience 2) and a sparse background scatter of lithic debris (Provenience 1). No artifacts were recovered from subsurface test excavations. The background lithic scatter included 45 lithic artifacts and covered an area measuring 100 m. N/S by 94 m. E/W. The lithic concentration consisted of 50 lithic artifacts and measured 24 m. N/S by 14 m. E/W. The lithic assemblages are described by provenience below.

Provenience 2 (Lithic Concentration) • Fifty lithic artifacts were recovered from the lithic concentration. Artifacts included 33 flakes, 9 cores, 1 biface, 2 scrapers, 3 wedges, and 3 manos. Eighty-four percent of these artifacts were manufactured from intermediate granitic materials.

Debitage from this area is characteristic of primary decortication and secondary reduction. Only 17 percent of the intermediate granitics lacked cortex. Seventy-two percent of the platforms on these materials were cortical. Other material classes lacked sufficient counts for interpretation. A single flake of intermediate granitic material exhibited a retouched platform suggesting that a formal tool was manufactured or resharpened in the area. It was not possible to identify use or preparation on this platform and therefore not possible to distinguish manufacture from resharpening.

Nine cores and core tools were recovered from this lithic concentration. Seven of these were manufactured from intermediate granitic material and two were of melaphyre. The high proportion of intermediate granitic cores is consistent with the debitage from this material category. Four of these cores exhibited secondary use as grinding implements, while four other cores were used as tools.

This area exhibited additional evidence for expedient tool-use, with eleven flake tools and two retouched flake tools. With one exception all tools exhibited polish and striations. One tool showed unidirectional rounding. The majority of these tools were manufactured from intermediate granitic material. These tools indicate that expedient flake tools were used in scraping. Although the two retouched tools exhibited unidirectional retouch, the direction of striations indicates that they were used as cutting tools.

Four additional flakes of intermediate granitic material exhibited ground and polished dorsal surfaces. Evidence of scraping was recorded on the ends of three flakes. These artifacts may represent secondary use of portions of a ground hoe or axe.

Other chipped stone artifacts included two scrapers and three wedges. The scrapers reinforce other evidence for scraping at the location. As discussed above, the wedges may indicate bone tool manufacture or splitting of sedimentary rocks.

Evidence for vegetal processing was indicated by groundstone fragments. Three different manos were represented by three fragments recovered from this area. No metates were identified.

The abundant evidence for a variety of activities in this portion of the site suggests a longer-term occupation. Although no structures or hearths were identified in the limited testing, the intensity and diversity in activities represented suggest that structural features may have been present.

Provenience 1 (Background Lithic Assemblage) • The lithic artifacts that were recovered from the background scatter were similar to those recovered from the concentration, although overall density was not as great. A total of 45 artifacts included 32 flakes, 10 cores, 1 scraper, 1 biface, and 1 mano. Although material-type variation was similar, a high proportion of Brushy Basin chert (16%) occurred in this area. Intermediate granitic material made up 67% of the assemblage.

Dorsal cortex and platform variation on flakes is similar to debitage in the lithic concentration (Provenience 2). This debitage indicates that both decortication and secondary reduction occurred at the site.

Ten cores were also recovered from this area. Unlike the lithic concentration, the majority of these cores (seven artifacts) lacked evidence of secondary use as tools or grinding implements. Three artifacts exhibited secondary use as pecking implements. This type of use is known to result from resharpening groundstone. For the most part, the variation in core material types is similar to that of debitage material types.

Additional evidence for activities comes from three expedient flake tools. These tools exhibit evidence of scraping. A single Brushy Basin chert flake exhibited a retouched platform, suggesting that a formal tool was manufactured or resharpened at the site. No evidence of use or preparation could be identified on the platform.

Other artifacts found in this area include a scraper, a biface, and a mano. The scraper exhibited unidirectional wear typical of scraping and the biface lacked evidence of use. The single piece of groundstone suggests that vegetal processing occurred at the site.

Summary

The lithic assemblage in the concentration exhibits greater evidence for diverse and more intense activities than does the background assemblage. These data indicate that the spatial separation of the lithic concentration on the basis of scatter plots is probably valid. It further suggests that the background assemblage is peripheral to the lithic concentration. Site FA 2-9 exhibits evidence for a variety of activities that are not typical on limited-activity sites. The diversity and intensity of activities represented suggest seasonal occupation of the site. The lack of structural features (hearths, etc.) is unusual for a site with this range of functional variation.

FA 2-10

FA 2-10 is a low-density lithic scatter with some modern disturbance. Three sherd were recovered: one of undifferentiated plainware and two of undifferentiated whiteware.

A total of 79 lithic artifacts was recovered from the site. These artifacts include 66 flakes (1 bipolar), 6 cores, 2 retouched flakes, 1 biface, 1 mano, 1 axe, and 1 side-notched tool. Raw material diversity is similar to other sites in the area. The majority of these artifacts (58 artifacts) were manufactured from intermediate granitic rock. Other materials include San Juan fossiliferous chert (five artifacts), melaphyre (four artifacts), Morrison gray chert (three artifacts), Bushy Basin chert (three artifacts), and sandstone (two artifacts). The remaining four artifacts represent four locally available material categories.

Scatter diagrams of lithic artifacts were plotted to identify potential activity areas. These plots identified no spatially distinct activity locations, so all surface artifacts are reported as a single assemblage (Provenience 1). This scatter measured approximately 225 m. N/S by 175 m. E/W. Five shovel test pits were placed across the site. Ten pieces of lithic debitage were recovered from these shovel tests. These tests are labeled Provenience 2. The lithic assemblage will be described for each provenience.

Provenience 1 • Sixty-nine lithic artifacts were recovered from the surface of the site, most of which were pieces of debitage (56 flakes). The remaining thirteen lithic artifacts include the previously mentioned tools, groundstone, and cores.

Debitage from this area is characteristic of primary decortication and secondary reduction. Sixty-eight percent of the items exhibited varying degrees of dorsal cortex, and 64 percent had cortical platforms.

Six cores with high percentages of cortex were recovered from this area, supporting the other evidence of primary reduction. Two tested cores, one from intermediate granitic rock and one from hornfels, appear to indicate that raw materials occur close by, as such artifacts typically occur at material acquisition loci. Three multiplatform cores, two manufactured from intermediate granitic rock and one from Brushy Basin chert, were also recovered. The one single platform core that was recorded was manufactured from intermediate granitic rock. None of these cores exhibited any evidence of secondary use as tools or grinding implements. One bipolar flake was also recovered from this provenience, suggesting that a small nodule was reduced in this area.

A single flake of intermediate granitic material exhibited a retouched platform, suggesting that a formal tool was manufactured or resharpened in the area. No evidence of use was identified on the platform. A biface fragment of San Juan fossiliferous chert was also recovered. This was in the early stage of manufacture, and was likely made at the site.

There was evidence for expedient tool use in this area. A flake and a retouched flake had unidirectional scars, suggesting scraping. Cutting also occurred at the site, as indicated by a retouched flake with bidirectional scares and rounding.

Other activities are indicated by a sandstone axe, a quartizite side-notched tool, and an intermediate granitic mano fragment. This single piece of groundstone suggests that vegetal processing occurred at the site.

Provenience 2 • Ten lithic artifacts were recovered from subsurface test excavations. All these artifacts were flakes that were manufactured from three material types: intermediate granitic rock (six flakes), Brushy Basin chert (two flakes), and melaphyre (two flakes). Though few in number, this assemblage mirrors the surface assemblage, with dorsal cortex and platform types suggesting both primary and secondary reduction. Seventy percent of the flakes exhibited varying degrees of dorsal cortex, while the platforms recorded were either cortical (40%) or single facet (60%).

Summary

The debitage and cores recovered from this site suggest an emphasis on decortication and primary reduction. Both freehand and bipolar reduction techniques were employed. Formal tools were also manufactured at the site. Expedient tool-use indicates that both cutting and scraping were performed. The variation in activities represented, and the lack of structural features, suggest seasonal occupation of the site more than once.

FA 2-11

FA 2-11 consists of a dense concentration of lithics, a less dense background lithic scatter, and three possible features. A single sherd was also recovered (Raish, this volume), and the site can be dated PII - PIII (Bertram, this volume).

A total of 75 lithic artifacts was recovered from the site. These artifacts included 63 flakes and pieces of small angular debris, 2 projectile points, 4 bifaces, 3 cores, a drill, and 2 fire spalls. The material types represented across the site, for the most part, are similar to local raw materials that occur on other sites in the study area. The majority of the assemblage consists of intermediate granitic rock (58%) and San Juan fossiliferous chert (26%). Eleven additional artifacts were manufactured from four locally-available materials, and a single projectile point was manufactured from obsidian that is found in the Jemez Mountains and and the Rio Grande gravels south of those mountains.

Scatter diagrams were used to plot artifacts across the surface of the site to identify potential activity locations. Two surface proveniences were defined on the basis of these plots. Provenience 2 represents a dense concentration of lithics in the southern portion of the site and Provenience 1 is a sparse scatter of background lithics to the north. No lithic artifacts were recovered from subsurface tests on the site.

Provenience 2 (Lithic Concentration)

A total of 53 lithic artifacts was recovered from the lithic concentration in the southern portion of the site. These included 45 flakes, a projectile point, 4 bifaces, a core, a graver, and two fire spalls. All lithics that were recovered from this area were manufactured from locally-available materials. The raw materials in this area consist primarily of intermediate granitic rock (77%, 35 artifacts).

Dorsal cortex on flakes recovered from this area indicates both primary and secondary reduction of intermediate granitics. Sixty-eight percent of the assemblage lacks cortex, while 30% exhibited cortex covering up to 99% of dorsal surfaces. A bifacial core, manufactured from intermediate granitic material, was recovered from this area.

Platform data also indicate primary and secondary reduction, supporting evidence gained from dorsal cortex. These data indicate that formal tool manufacture occurred as well. Two intermediate granitic flakes exhibit retouched platforms, which indicate that they were removed during the manufacture or resharpening of a bifacially-retouched tool. These platforms exhibit grinding preparation but lack evidence of use.

Additional diversity in site function is indicated by a variety of formal tools that were recovered from this provenience. Tools included four bifaces, a projectile point, and a graver. All the bifaces were manufactured from San Juan fossiliferous chert. Three of the biface fragments were discarded during early stages of manufacture. All exhibited successful heat treatment. One late biface fragment was also recovered. The small Navajo projectile point that was recovered was also manufactured from fossiliferous chert. The graver was manufactured from yellow silicified wood that was successfully heat treated.

Provenience 1 (Background Lithic Scatter)

Twenty-one lithic artifacts were recovered from the sparse background assemblage. These included 18 flakes and pieces of small angular debris, 2 cores, and 1 projectile point. Unlike the lithic concentration (Provenience 2) most of these lithics were manufactured from San Juan fossiliferous chert (43%, 9 artifacts). This material class was followed in frequency by intermediate granitic rock (33%, 7 artifacts). Four other flakes were manufactured from other locally-available materials, and a single projectile point was manufactured from obsidian.

The dorsal cortex and platform data for debitage in this area of the site are similar to those of Provenience 1. Primary and secondary reduction of San Juan fossiliferous chert and intermediate granitics is indicated. Two retouched platforms on fossiliferous chert flakes, however, suggest that formal tools were also manufactured from this material.

A projectile point manufactured from Jemez obsidian was recovered from this area. Typologically it is a Mohave point, which is inconsistent with the Navajo point recovered from Provenience 2. In my experience, it is not unusual for dated projectile points not to correspond to other temporal indicators on a site.

Summary

The lithic materials that were recovered from the site indicate a variety of reduction techniques. While primary and secondary reduction is indicated, formal tool manufacture is also represented. Although both Navajo and Mohave points occur on the site, it is unclear if they are associated with the site occupation represented by other artifacts. It is more likely that the Navajo point is associated with the rest of the lithic assemblage because it was manufactured from San Juan fossiliferous chert which was represented in debitage across the site. The Mohave point was manufactured from Jemez obsidian, a material that does not occur in the lithic debitage on the site. Although the presence of a graver suggests that tool-use occurred at the site, the lack of utilized formal tools and expedient flake tools suggests that the site was primarily a place to manufacture tools.

FA 2-12

FA 2-12 is a sparse lithic scatter located on the western slope of a sand dune ridge. All artifacts were recovered from the surface of the site; no ceramics were found. The site is undated.

A total of 17 lithic artifacts was recovered from the site. These artifacts include 14 flakes, 1 core, 1 hammerstone, and 1 piece of undetermined groundstone. The majority of these artifacts were manufactured from San Juan fossiliferous chert (nine artifacts) and intermediate granitic (three artifacts). The remaining artifacts were manufactured from five other locally-available materials.

The sparse lithic scatter was located in an area measuring 50 m. N/S by 30 m. E/W. Scatter plots did not identify isolated activity locations so the entire assemblage is reported as one provenience.

Site Assemblage

Flake counts within each material category are low, limiting technological interpretations. There is, however, evidence for primary decortication.

Three flakes exhibited retouched platforms, indicating that formal tool resharpening or manufacture occurred at the location. Examination of a San Juan fossiliferous chert platform identified use-wear at the intersection of platform dorsal surfaces, which indicates resharpening. These data suggest that formal tools were used and resharpened at the site. Other evidence for tool use was seen in a flake tool with unidirectional rounding typical of scraping. This tool was also manufactured from San Juan fossiliferous chert.

Other artifacts that were recovered from the site include a fragment of undetermined groundstone made from sandstone, a quartzite hammerstone, a core, and an early-stage biface. The groundstone exhibited a concave grinding surface and was manufactured from medium-grained sandstone. A multiplatform core exhibited 51-75% cortex, indicating limited reduction. The early biface was manufactured from silicified wood and exhibited successful heat treatment, but overall morphology indicates that it was a manufacturing failure.

Summary

The low artifact count on this site limit interpretations. Use-wear, however, indicates that a retouched tool was resharpened at the site, and that expedient scraping occurred. Grinding is suggested by the groundstone fragment.

FA 2-15

FA 2-15 is a lithic scatter and groundstone concentration. No dates are known for the site.

A total of 101 lithic artifacts was recovered from the site. These artifacts include 72 flakes (2 bipolar), 4 bifaces, 16 manos, 2 unifaces, and a retouched flake. Two fire spalls and one unmodified rock were also collected. Three cores and one exhausted core had been originally classified as part of the lithic assemblage. A re-examination of these artifacts showed that only two cores were present at the site. Most of the artifacts were manufactured from conchoidal wood (29 artifacts), High Surface gravels (28 artifacts), sandstone (13 artifacts), yellow wood (11 artifacts), and intermediate granitic rock (9 artifacts). Other materials include quartzite (five artifacts), banded chalcedony (two artifacts), and one artifact each from splintered wood, moss jasper, and San Juan fossiliferous chert. All these materials may occur locally.

Scatter plots of lithic artifacts were used to identify potential activity locations. These plots identified two spatially discrete lithic clusters (Proveniences 1 and 2) and a dispersed background of lithic debris (Provenience 3). Provenience 1 is a moderately dense concentration of 56 lithic artifacts covering an area measuring 11 m. N/S by 8 m. E/W. Located immediately north of Provenience 1, Provenience 2 contains 20 artifacts within an area measuring 15 m. E/W by 11 m. N/S. The background lithic scatter included 24 lithic artifacts and covered an area measuring 41 m. E/W by 38 m. N/S. Lithic assemblages are described by provenience below.

Provenience 1 (Southern Concentration)

A total of 56 lithic artifacts was recovered from within this provenience. These artifacts included 35 flakes (2 bipolar), 13 manos, 2 bifaces, 2 cores, 1 uniface, and 1 retouched flake. Also collected were one unmodified rock and a fire spall. These artifacts were manufactured from a variety of locally-available materials. Raw material types represented include conchoidal wood (15 artifacts), sandstone (11 artifacts), High Surface gravels (9 artifacts), yellow wood (8 artifacts), intermediate granitic rock (6 artifacts), quartzite (4 aritfacts), and one artifact each from splintered wood, San Juan fossiliferous chert, and moss jasper.

Debitage characteristics indicate secondary reduction. Seventy-two percent of the flakes lacked dorsal cortex, and sixty-six percent of the platforms were single faceted and collapsed. Although limited, evidence from dorsal cortex and platform data indicate that some primary reduction also occurred within this provenience.

Two cores were also recovered. Both were multiplatform; they were of conchoidal wood and of intermediate granitic rock, with cortex in the 1-25% range. One of the cores also exhibited evidence of battering, suggesting use as a pecking stone. Two bipolar flakes were recovered, suggesting that small modules were reduced in this area.

Three formal tools, two bifaces, and a uniface blank were recovered from this provenience. Both bifaces were fragments and represented early stages of manufacture. These were manufactured of yellow wood and conchoidal wood; the latter had been successfully heat-treated. Evidence of secondary use was present on the biface of yellow wood. The uniface blank was manufactured of High Surface gravels and exhibited no use-wear. Three flakes with retouched platforms were also recovered. These were made from yellow wood, conchoidal wood, and intermediate granitic rock. Both the yellow wood and conchoidal wood flakes exhibited grinding and utilization on the platforms, respectively. These flakes and the two bifaces suggest that manufacturing of these tools probably occurred within this provenience. The one flake of intermediate granitic rock suggests that a formal tool was manufactured of this material at this location but taken away for future use.

Evidence for expedient tool-use was indicated by two flakes with bidirectional rounding, and unidirectional scars and rounding. These artifacts suggest that both cutting and scraping occurred within this provenience.

Vegetal processing may also have occurred in this area, as indicated by the grinding implements. Thirteen manos were recovered, twelve of sandstone and one of quartzite. No metates were identified.

The abundant evidence for a variety of activities in this portion of the site suggests a fairly long-term occupation. Although no structures or hearths were identified, the diversity of activities suggests that such features were probably present.

Provenience 2 (Northern Concentration)

Twenty lithic artifacts were recovered from this provenience. These include 19 flakes and a uniface. These artifacts were manufactured from conchoidal wood (nine artifacts), High Surface gravels (eight artifacts), yellow wood (two artifacts), and intermediate granitic rock (one artifact).

As with Provenience 1, debitage characteristics indicate an emphasis on secondary reduction. Fifty-seven percent of the debitage lacked dorsal cortex and fifty-eight percent exhibited single-facet platforms.

Three flakes, two of conchoidal wood and one of yellow wood, exhibited retouched platforms, suggesting that at least two formal tools were manufactured or resharpened in the area. Two of these platforms were ground, indicating platform preparation. A fragment of a uniface manufactured from conchoidal wood was recovered from this provenience.

A single flake of conchoidal wood exhibited expedient use-wear. The flake had unidirectional scars indicative of scraping.

Activities in Provenience 2 seem to have been similar to those of Provenience 1, although this area was not used as intensely. No evidence of grinding was identified in this provenience.

Provenience 3 (Background Scatter)

The lithic artifacts that were recovered from the background scatter were similar to those recovered from the two clusters. A total of 24 artifacts included 18 flakes, 3 manos, 2 bifaces, and a fire spall. Material type variation was also similar. High Surface gravel material comprised 46% of the assemblage.

Dorsal cortex and platform variation on flakes is similar to the debitage in Proveniences 1 and 2. This debitage indicates that mainly secondary reduction occurred within this area, and that most decortication probably occurred at another locale.

A flake manufactured from High Surface gravels also exhibited a retouched platform. No utilization or grinding was evident on this platform. A biface blank fragment of the same material was recovered from this area. One other biface fragment of fossiliferous High Surface chert was also recovered. This tool was in the early stage of manufacture and exhibited successful heat treatment.

A single flake of High Surface gravel exhibited expedient tool-use. This flake had unidirectional scars and rounding, indicative of scraping.

Vegetal processing evidence was also present within this provenience. Three manos were recovered. Two were manufactured from sandstone and one was of quartzite. No metates were identified.

Summary

FA 2-15 exhibits evidence for a variety of activities. The debitage assemblage is characteristic of secondary reduction and formal tool manufacture. The groundstone assemblage shows an emphasis on vegetal processing. The diversity and intensity of activities represented suggests seasonal occupation of the site. The lack of structural features (hearths, etc.) is unusual for sites with this range of functional variation.

FA 2-16

FA 2-16 is a multicomponent site consisting of a rock shelter, three petroglyph panels, and associated lithic and ceramic scatters. Radiocarbon dates and ceramic dates suggest that the site was occupied over several temporal periods (Raish, this volume). Feature 1 (charcoal stain and fire-cracked rock scatter) radiocarbon dates are more closely associated with the Feature 2 (Rock shelter) ceramics (Mesa Verde B/W) than the ceramics that were recovered from the central portion of the site (PII/PIII). Feature 2 reflects an occupation from Basketmaker to PIII times.

Only 44 lithic artifacts were recovered from the site, although subsurface test excavations indicate that there are buried deposits. These artifacts included 30 flakes (2 bipolar), 7 cores, a mano, and a grooved maul. Four unmodified rocks were also recovered. The majority of these artifacts were manufactured from intermediate granitic rock (42%) and melaphyre (12%), which are both locally available. The remaining 18 artifacts were manufactured from 11 different materials. All materials, with the exception of a core and a grooved maul, were manufactured from locally-available materials. The core and the maul were manufactured from vitrophyre basalt, which is not known to occur locally. The closest known sources for this material are the No Aqua Mountains and San Antonio Mountains west of Quemado, and in the Cochiti area.

Scatter diagrams were generated to plot artifacts across the surface of the site. These diagrams indicate that surface artifacts occur in three areas: outside of the rock shelter (western artifact scatter, Provenience 1); near Feature 1 (central artifact scatter, Provenience 2); and near the eastern petroglyph panel (eastern artifact scatter, Provenience 3). Subsurface artifacts were recovered from a test pit that was placed in the central hearth, Feature 1 (Provenience 4), and the Rock Shelter, Feature 2 (Provenience 5). Lithic artifacts will be described for the three surface areas and associated subsurface tests.

Western Artifact Scatter

The surface assemblage outside the rock shelter is described as Provenience 1 and the subsurface test excavtion in the rock shelter is summarized as Provenience 4.

Provenience 1 • The area in front of the rock shelter exhibited the densest scatter of lithic debris on the site. A total of 29 lithic artifacts was recovered from this area. Artifacts include 22 flakes (2 bipolar), 6 cores, 1 grooved maul, and 2 burned cobbles. The majority of these lithic artifacts were manufactured from intermediate granitic rock (59%, 10 artifacts). This high percentage of intermediate granitics is typical for many sites in the study area. Five artifacts (17% of the assemblage) were manufactured from melaphyre. All but two of the remaining lithic artifacts were manufactured from nine other locally-available materials. One basalt core and a grooved maul were manufactured from a vitrophyre basalt that is not known to occur locally.

Both primary and secondary reduction is indicated by dorsal cortex on flakes in the assemblage. Although counts are low the intermediate granitic flakes exhibit both high and low percentages of dorsal cortex. Although dorsal cortex among a variety of materials types represented by only one or two flakes is relatively low, the preponderance of cortical platforms among all material categories suggest that materials were not brought to the site as prepared cores. Although limited, evidence from dorsal cortex and platform data indicate that primary reduction occurred at the location. Two bipolar flakes were recovered from this locale suggesting that small nodules were reduced.

Although only a single formal tool was recovered from the site, retouched platforms on flakes suggest that two additional tools may have been manufactured at this location. The three flakes with retouched platforms were manufactured from banded chalcedony, intermediate granitic rock, and High Surface quartzitic sandstone. Although a retouched tool of quartzitic sandstone was recovered, there were no tools manufactured from the other two materials. These two tools were apparently manufactured at the location but taken away for future use. All the retouched platforms lacked evidence of use typical of resharpening.

Seven cores with high percentages of cortex were recovered from this area supporting other evidence that primary reduction occurred at the location. Two tested cores appear to indicate that raw materials occur close by although one was manufactured from a vitrophyre basalt (3700) that, as noted, is not known to occur locally. Tested cores typically occur at material acquisition locations. Three single platform cores, two manufactured from intermediate granitic rock and one from Morrison gray chert, were also recovered. The two multiplatform cores that were recorded were manufactured from intermediate granitic rock and melaphyre.

A variety of functions is indicated by artifacts in this area of the site. Two of the cores that were recovered exhibited evidence of battering; one was apparently used as a chopper and the other as a pecking stone. Pecking stones are commonly used to resharpen groundstone (see definitions, supra), although no groundstone was recovered from this area. Expedient tool-use is indicated by a flake with bidirectional use-wear. This artifact indicates that cutting occurred at the location. A retouched quartzitic sandstone flake indicates that scraping occurred also. A grooved maul which was manufactured from non-local basalt was also recovered.

Provenience 4 • A single test pit was placed in the rock shelter to assess subsurface deposits. Three flakes and two burned cobbles were recovered from this test excavation. Two of the flakes were manufactured from intermediate granitic rock, and one from High Surface chert. All exhibited single faceted platforms. No other lithic artifacts were recovered.

Central Artifact Scatter

The hearth (Feature 1), and the associated low-density surface scatter in the central portion of the site, will be described as Provenience 2. The subsurface test in Feature 1 will be reported as Provenience 5.

Provenience 2 • Only seven lithic items were recovered from this area. They consisted of five flakes that were manufactured from intermediate granitic rock (four artifacts) and High Surface chert (one artifact), and two pieces of fire-cracked rock.

The flake that was manufactured from High Surface chert exhibited a retouched platform suggesting that a formal tool was manufactured in the area although no formal tools of this material type were recovered from the site. No evidence of use was identified on the platform.

Provenience 5 • Twenty-one lithic artifacts were recovered from this provenience. Two lithic tools were found during excavation: a mano, and a core which had been used as a pecking stone. Pecking stones, as noted, are commonly used to resharpen groundstone surfaces. The mano was manufactured from a medium grained sandstone. It was not possible to determine if the fragment represented a one- or two-hand grinding implement. One burned cobble and 17 pieces of fire-cracked rock were also recovered. These artifacts support other evidence that hearth-related activities occurred in this locale.

Provenience 3 (Eastern Artifact Area)

A single flake was recovered from this portion of the site. It was manufactured from intermediate granitic rock and exhibited a single facet platform. Dorsal cortex was 26-50%. No other lithic artifacts were recovered.

Summary

The debitage that was recovered from Provenience 1 suggests an emphasis on primary reduction, although indications of seconday and tertiary reduction were also present. Both freehand and bipolar reduction techniques were utilized. Although only one retouched tool was recovered, flakes with retouched platforms suggest that two additional formal tools were manufactured at the site. The lithic artifacts that were recovered from Provenience 1 indicate considerable functional diversity. Secondary core use indicates chopping and pecking, while use-wear represents both cutting and scraping.

The lithic materials that were recovered from the central portion of the site are similar to those recovered around the rock shelter. The assemblage found in association with Feature 1 exhibits a high frequency of fire-cracked rock, suggesting that the hearth may have been used for roasting.

FA 2-17

FA 2-17 is a lithic scatter and an associated ash and charcoal stain in a dune area. No date could be obtained through radiocarbon dating; however, diagnostic projectile points include types associated with the early and late Archaic, as well as Anasazi, time periods.

A total of 644 lithic artifacts was recovered from this site. These include 573 flakes, 2 retouched flakes, 47 pieces of small angular debris, 4 projectile points, 3 bifaces, 8 cores, 5 fire spalls, 1 mano, and 1 non-cultural stone. These artifacts were manufactured of a wide variety of raw materials, all available locally. The most frequent of these materials are High Surface cherts (25%, 164 items) and conchoidal silicified wood (22%, 145 items). The remaining 333 artifacts represent 20 different material types.

Scatter plots of lithic artifacts were used to identify potential activity areas. Three concentrations of artifacts can be observed on the diagrams. These occur in dune blowouts and were defined as separate proveniences in the field. Provenience 1 (also termed Locus 1) represents the surface artifacts collected within the northwestern blowout. This provenience included a hearth feature (stain) and measures approximately 25 m. long (NE/SW) by 15 m. wide (NW/SE). Artifacts recovered from test excavations within this area are grouped into Provenience 4. Provenience 2 is the surface material collected from a 10 m. by 10 m. area within the southern cluster of artifacts located next to an escarpment (Locus 2). This scatter measures approximately 21 m. long (NW/SE) by 10 m. wide (NE/SW). Artifacts recovered from the test trench through this area are defined as Provenience 5. Provenience 3 (surface material from Locus 3) is located in a blowout about 7 meters to the east of Provenience 1, and measures approximately 25 m. N/S by 14 m. E/W. Artifacts recovered from test excavations in this area are defined as Provenience 6. The lithic assemblage from each provenience will be described below.

Northwest Artifact Scatter

The surface artifacts collected from the sample area within this blowout are described as Provenience 1. Subsurface artifacts recovered from the surface stripping and excavation of the trench are described as Provenience 4. Surface stripping identified a dark area of stained soil, perhaps a hearth in the west side of excavation grid 105N/106E. No radiocarbon date was obtained.

Provenience 1 • A total of 163 lithic artifacts was recovered from the surface in this area. These are 146 flakes (2 bipolar), 2 retouched flakes, 8 pieces of small angular debris, 2 bifaces, 3 cores, 1 fire spall, and 1 mano. The majority of these artifacts were manufactured of High Surface gravels (21%, 34 artifacts), Moss jasper (13%, 22 artifacts), and conchoidal silicified wood (12%, 20 artifacts). The remaining 88 items were manufactured of 17 different local materials.

Examination of percentages of dorsal cortex on flakes suggests that some primary reduction of several different materials may have occurred at this location. A wide range of dorsal cortex percentages can be observed within the High Surface gravels and the Morrison mottled chert. This suggests that primary and possibly some secondary reduction of these materials may have occurred in this area. Limited cortex is present on the dorsal surfaces of flakes from 12 other materials, although most of these material types exhibit a majority of flakes with no dorsal cortex. This suggests that for these materials, reduction may have been more complete, and there was less decortication at this provenience. Examination of platform types supports this suggestion. Of the 91 recorded platforms, only 8 (8%) exhibited cortex indicative of decortication. This suggests an emphasis on later stages of reduction.

Only three cores were recovered from this provenience. Two multiplatform cores (of Morrison tan chert and intermediate granitic rock) were recovered. Also recovered was a limestone single platform core which exhibited battering typical of use as a pecking stone.

Evidence of later stages of reduction, including tool manufacture, is also observed within this provenience. The presence of retouched platforms of seven different material types suggests that numerous formal tools may have been produced in this vicinity. Retouched platforms are observed on flakes of conchoidal silicified wood, splintered silicified wood, Morrison light chert, undifferentiated black chert, High Surface gravel, moss jasper, and High Surface quartzitic sandstone. Two of these platforms also exhibited utilization on their platform dorsal edge. Utilization on this edge margin indicates that these flakes were removed when utilized formal tools were resharpered. One of these flakes was manufactured of splintered silicified wood, and one was manufactured of moss jasper. Nine ground platforms of three different materials were also noted, indicating that platforms were prepared for retouching. This suggests that tertiary reduction, or formal tool manufacture, occurred at this location.

Two bifaces were recovered from this provenience. One was manufactured of conchoidal silicified wood and the other was made of moss jasper. Since retouched flakes from both these material types were observed within this provenience, it is quite possible that these two artifacts were manufactured and discarded at this same location. The formal tool analysis indicates that both of these tools were functionally incomplete and are therefore suspected to be manufacturing failures. Manufacturing failures are expected to be discarded at their location of manufacture. Since this blowout was not completely collected, we cannot be sure if additional bifaces manufactured of the other materials may have been present.

Evidence of expedient tool-use is also present within this provenience; nine utilized flakes were observed. Two flakes, manufactured of yellow silicified wood, exhibited wear patterns along one edge. One of these exhibited unidirectional rounding and scars indicative of scraping, while the other exhibited bidirectional rounding and scars indicative of cutting. Conchoidal wood also was used to manufacture expedient flake tools, with two flakes exhibiting use-wear like the yellow wood tools above. Splintered silicified wood exhibited bidirectional rounding, also indicative of cutting. A flake of Morrison light chert exhibited bidirectional scars. Unidirectional scars and rounding were observed on an undifferentiated black chert flake and on a piece of High Surface quartzitic sandstone. One moss jasper flake exhibited one edge with unidirectional scars and another edge with unidirectional rounding. Since expedient tools are expected to be discarded at their location of use we can assume that some cutting and scraping occurred within this provenience. Examination of subsurface artifacts supports this claim. The recovery of one sandstone mano suggests that vegetal processing may also have occurred.

Provenience 4 • This provenience consists of all the subsurface artifacts recovered from the test excavations within this northwestern blowout. These include 182 artifacts and one noncultural item, a higher frequency than collected from comparable surface areas. This suggests that the majority of the artifacts associated with this location were not visible, and were not collected. Subsurface artifacts recovered from the test trench through the stain include 154 flakes, 22 pieces of small angular debris, 1 late Archaic projectile point, 1 multiplatform core, and 3 fire spalls. Material variation generally mimics the surface assemblage with only a few exceptions. Melaphyre is present in the subsurface assemblage but was not collected from the surface. Both intermediate granitic rock and Brushy basin chert were noted on the surface but were not recovered from test excavations.

Like the surface assemblage, evidence of primary and secondary reduction is present. Although cortex was observed on flakes manufactured of most material types, the majority of flakes exhibited no cortex on their dorsal surfaces. Cortical platforms were noted on only 7 percent (6 platforms) of all the recorded platforms (82 flakes).

Evidence of tertiary tool manufacture is also present. Eight retouched platforms of seven material types were recovered. They are conchoidal silicified wood, Morrison mottled chert, Morrison light chert, undifferentiated black chert, High Surface gravels, moss jasper, and High Surface quartzitic sandstone. Only the Morrison mottled chert is not represented by retouched platforms in the surface assemblage. Two flakes, of Morrison light chert and of undifferentiated black chert, exhibited utilization on their retouched platforms, suggesting that tools of these materials were maintained through resharpening at this location. Two flakes had grinding on their retouched platforms, suggesting additional platform preparation.

The only formal tool recovered from the testing in this blowout is a San Rafael projectile point dating to the late Archaic. This artifact was manufactured of conchoidal silicified wood. It is unclear if the item was manufactured or used at this location.

Expedient unmodified flake tools were quite numerous, with seven utilized flakes manufactured of six different materials. Like the surface assemblage, both unidirectional and bidirectional use-wear is present, suggesting both cutting and scraping.

Southern Artifact Scatter

The surface artifacts from a 10 m. x 10 m. area were collected and are defined as Provenience 2. Surface-stripping in a trench defined as Provenience 2 yielded many artifacts.

Provenience 2 • Eighty artifacts were recovered from Provenience 2. These include 73 flakes (1 bipolar), 5 pieces of small angular debris, 1 early Archaic projectile point, and 1 tested core. The majority of these artifacts are manufactured of High Surface gravels (31%, 25 items) and of conchoidal silicified wood (22%, 18 items). The remaining 37 items were manufactured of 10 different materials, all potentially local.

Evidence of decortication is more limited in Provenience 2 than in Provenience 1. The majority of the material types and the flakes lacked any cortex on their dorsal surfaces. Only the High Surface gravels and the moss jaspers exhibit a range in percentages of dorsal cortex. This suggests that some decortication of these materials may have occurred, but that generally decortication of the other material types occurred at another location. Platform data tend to support this suggestion, with cortex being present on twelve percent of all platforms and occurring only on five material types. Only one core was recovered. It was a tested core of local High Surface gravel.

Evidence of formal tool manufacture is also present, with 8 retouched platforms (16% of observed platforms) of 6 different local materials being recorded. These materials include yellow wood, conchoidal silicified wood, mottled Morrison chert, High Surface gravels, banded chalcedony, and High Surface quartzitic sandstone. This suggests that at least 6 tools were manufactured in this vicinity. Four of these platforms were ground, also suggesting formal tool manufacture.

Only one formal tool was recovered from the provenience. It is a side-notched early Archaic projectile point manufactured of yellow silicified wood. One yellow wood flake did exhibit a retouched platform but it is unclear if it was produced from this projectile point.

Evidence of expedient tool-use within this area includes three utilized flake tools. Two of these were manufactured of yellow wood and exhibit unidirectional wear. The other was manufactured of High Surface gravel and exhibits bidirectional wear. This suggests that as within Provenience 1, both cutting and scraping occurred.

Provenience 5 • This provenience includes all the cultural remains recovered from the surface-stripping of a trench within the surface-collected area. A total of 138 artifacts was recovered. These include 128 flakes, 7 pieces of small angular debris, and 3 cores. Material variety parallels the surface assemblage with only a few exception. Quartzite, Brushy basin chert, Morrison gray chert, Morrison light chert, and Palm wood are present in this assemblage but were not recovered from the surface-collected area.

Like the surface assemblage, there is evidence for limited decortication. Although the vast majority of all flakes lacked any dorsal cortex (75%, 95 flakes), cortex was observed on flakes from 11 of the 16 material types represented as flakes. Cortex on platforms was also recorded for four material types and comprises nine percent (seven platforms) of all platforms observed.

Evidence for tertiary reduction also mirrors the surface assemblage, except that the subsurface assemblage was composed of higher frequencies of retouched platforms. Within the subsurface assemblage, retouched platforms total 25% of all platforms observed, versus 16% in the surface assemblage. Palm wood, splintered silicified wood, Morrison light chert, undifferentiated black chert, and moss jasper are represented with retouched platforms but do not occur with retouched platforms on the surface. Two of these retouched platforms also exhibited use-wear, suggesting that a palm wood tool and a splintered silicified wood tool were maintained within this area. Three retouched platforms were ground.

No formal tools were recovered from the subsurface testing. However, the recovery of five expedient flake tools with both unidirectional and bidirectional use-wear indicates that tools were used for both cutting and scraping.

Northeast Artifact Scatter

This scatter of artifacts is located in a blowout immediately east of the northwest scatter. The surface collection is defined as Provenience 3, and the subsurface material recovered from the test trench is defined as Provenience 6.

Provenience 3 • A total of 58 artifacts was collected from the surface of the northeast scatter. These are 51 flakes, 4 pieces of small angular debris, 2 projectile points (one late Archaic and one Anasazi), and 1 biface. Like Provenience 2, the most common material types are conchoidal silicified wood (40%, 23 items) and High Surface gravel (40%, 23 items). The remaining twelve items were manufactured of seven different material types, all from local sources.

There is evidence for both limited decortication and secondary reduction. As is typical for this site, the majority of flakes lack dorsal cortex, but cortex is observed on most of the material types. Platform data are also consistent with this analysis, with eleven percent cortical platforms. No cores were recovered from this provenience.

Also typical of the site as a whole is evidence for formal tool manufacture, as indicated by numerous retouched platforms. Thirty-eight percent (13) of all platforms within Provenience 3 were retouched. Retouched platforms occur on conchoidal silicified wood, Morrison mottled chert, and High Surface gravels. Four of these platforms are also ground. This suggests that at least three formal tools may have been manufactured within this area.

Tool use is less represented within this provenience than in the other areas of the site. Formal tools themselves are well represented with three items. Both the late archaic San Rafael projectile point (High Surface quartzitic sandstone) and the Anasazi point (High Surface gravels) appear to be finished tools (functionally complete), broken by a basal snap. It is unclear if they were broken in use at this location or simply discarded here. The biface (conchoidal silicified wood) represents a manufacturing failure as it is classified as functionally incomplete.

Expedient tool-use appears limited, as indicated by the presence of only one unidirectionally utilized flake, manufactured of conchoidal silicified wood. Although scraping may have occurred within this area, they were probably more limited than in Proveniences 1 and 2.

Provenience 6 • This provenience consists of all subsurface artifacts collected in the test excavations of the northeastern blowout. A total of 23 artifacts was recovered from this area. There are 21 flakes, 1 piece of small angular debris, and 1 fire spall. The vast majority of the material is manufactured of conchoidal silicified wood (61%, 14 items) and High Surface gravels (26%, 6 items), like much of the site. The remaining 3 items are manufactured of palm wood, High Surface fossiliferous chert, and yellow wood.

Evidence for decortication and secondary reduction consists of the dorsal cortex on flakes and platform type. Although the sample is quite small (21 items) dorsal cortex is present for two out of the five materials represented, indicating that some decortication occurred. Cortical platforms are present on these same two materials (conchoidal wood and High Surface gravel).

As within the surface assemblage from this area, retouched platforms comprise a high percentage of all platforms (30%, 3 items) indicating formal tool manufacture. No formal tools were recovered from the subsurface of this area; however, all of the retouched platforms are on flakes of conchoidal silicified wood, like the manufacturing failure recovered from the surface. No expedient flake tools were identified.

Summary

FA 2-17 consists of three blowout areas, apparently representing long use. This Use may include early Archaic, late Archaic, and Anasazi occupations, as indicated by the 4 projectile points. One hearth was identified, but no date could be obtained.

The proveniences are spatially distinct, probably as a result of dune movement rather than because they were specific activity locations. Proveniences tend to exhibit considerable variety in lithic type and material type, which lends support to the suggestion that the site may have a long occupational history. All three areas yielded subsurface remains, which generally showed higher artifact densities in the first 10 cm. of soil than were visible on the surface.

The proveniences are somewhat homogeneous, with assemblages reflecting limited decortication; selection of local materials; and flake production for the making of retouched tools and of expedient tools used in cutting and scraping. Resharpening flakes indicate that some tools were resharpened here, presumably as they became dulled by use. The presence of one mano may indicate vegetal processing.

FA 2-18

FA 2-18 consists of a dense scatter of lithics in two concentrated areas exposed on a large coppice dune. A small scatter of fire-cracked rock is the only feature identified at the site. Although the presence of groundstone is indicated in the survey report, no groundstone was later identified. With the exception of one stemmed dart point collected during the survey, no potentially diagnostic artifacts were recovered.

A total of 118 lithic artifacts was recovered from the site, in addition to a projectile point previously collected. These artifacts include 103 flakes, 1 retouched flake, 9 pieces of small angular debris, 3 bifaces, and 2 cores. All of these artifacts were manufactured of a variety of raw materials that are locally available. The majority of these were manufactured of conchoidal silicified wood (38%) and of High Surface gravels (34%). The remaining 33 artifacts were manufactured from 9 different locally-available material types.

Scatter plots were examined to identify spatial clusters that could potentially represent activity locations. These plots illustrate two distinct concentrations of lithic surface artifacts. Provenience 1 (also referred to as Locus 1) is the northern scatter, measuring approximately 14 m. N/S by 8 m. E/W. Provenience 2 (also referred to as Locus 2) is the southern scatter and measures approximately 11 m. N/S by 6 m. E/W. Numerous artifacts were recovered subsurface. Artifacts from testing within the northern scatter are represented by Provenience 3. Artifacts from testing within the southern scatter are represented by Provenience 4. The lithic assemblage will be described for each provenience below.

Northern Artifact Scatter

All surface artifacts recovered from this concentration are described as Provenience 1 and subsurface artifacts recovered from testing in this area are described as Provenience 3.

Provenience 1 • A total of 53 lithic artifacts was collected from the surface of this artifact scatter. Fire-cracked rock was noted but not collected. Collected surface artifacts included 43 flakes, 7 pieces of angular debris, 1 biface, and 2 cores. Sixty-nine percent of these (36 artifacts) were manufactured of local High Surface gravel cherts and chalcedonies, and 23% (12 artifacts) were manufactured of banded chalcedony. The remaining four artifacts were manufactured of two material types, both presumed to be locally available.

Primary and secondary reduction most certainly occurred within this provenience, as indicated by the presence of dorsal cortex on flakes manufactured from every material type with the exception of splintered silicified wood. Most of the flakes of High Surface gravels displayed some dorsal cortex, and both of the flakes of moss jasper displayed dorsal cortex. Banded chalcedony, however, exhibits a majority (62%) of flakes which lack any dorsal cortex, suggesting that much of the decortication of this material may have occurred at another location. Secondary reduction, involving the further reduction of a core through flake production, is indicated by the presence of flakes which lack any cortex. The other two materials occurring as flakes within this provenience are represented by only one flake each. Presence of cortical platforms for both High Surface gravels and for the banded chalcedonies supports the suggestion that some decortication occurred at this location for both materials, including the banded chalcedony.

Examination of the core data supports those findings. The only two cores that were recovered from this site were collected in this provenience. One of these is a banded-chert tested rock, suggesting that this material was acquired nearby. Tested rocks typically reflect the evaluation of material quality at a raw material source. The other core is an exhausted multiplatform core of High Surface gravel. The presence of this exhausted core, which exhibits 76-99% cortex, is somewhat problematical, since exhausted cores are typically not expected at raw material sources and generally lack high percentages of cortex. However, the very presence of the core still exhibiting cortex, along with the platform and dorsal cortex data, suggest that this material type may have been located, tested, and further reduced at this location.

Evidence for formal tool manufacture within this northern scatter includes three flakes (High Surface gravel) which exhibit retouched platforms. This suggests that a retouched formal tool may have been manufactured at this location. One biface of this material type is present within this scatter and is manufactured of the same material as the flakes with retouched platforms. This biface was successfully heat-treated, and exhibited no identifiable wear patterns. It is unclear if this biface was actually manufactured, heat-treated, or used for a particular activity in this provenience. No expedient flake tools were identified in this provenience.

Provenience 3 • Three artifacts were recovered from subsurface test excavations in the northern scatter. These include one flake and two pieces of small angular debris. Two of these artifacts (flake and small angular debris) were manufactured of High Surface gravels, which occur in high frequencies in the surface assemblage. One artifact of conchoidal silicified wood (small angular debris) was also identified, but this material type was not represented in the surface assemblage from this scatter. The one flake lacked dorsal cortex but did exhibit a cortical platform. This is consistent with the material collected from the surface, which indicates that both primary and secondary reduction of High Surface gravels occurred.

Southern Scatter

The southern artifact scatter consists of both surface and subsurface assemblages. Provenience 2 represents the surface collected material, and Provenience 4 represents the subsurface material from test excavations.

Provenience 2 • Fifty-one artifacts were collected from the surface of the southern artifact scatter. These include 49 flakes, 1 retouched flake, and 1 biface. Among these artifacts, the most common material types represented are conchoidal silicified wood (67%, 34 artifacts), and fossiliferous San Juan chert (10%, 5 items). Both of these material types are locally available. The remaining twelve items are manufactured of seven different material types, which may all occur locally.

Unlike Provenience 1, Provenience 2 has more limited evidence of primary reduction, with the vast majority of flakes (76%) lacking any dorsal cortex. Dorsal cortex is only present on 30% (10 artifacts) of the flakes made of conchoidal silicified wood, and 66% (2 artifacts) of the flakes made of High Surface quartzitic sandstone. None of the other seven material types exhibited any dorsal cortex. This suggests that flake production and tool manufacture may have been the primary activities within this provenience, rather than primary reduction and lithic material procurement as in Provenience 1.

Examination of platform data supports this suggestion, with only one flake of conchiodal silicified wood exhibiting a cortical platform. Flakes with retouched platforms indicative of formal tool manufacture are well represented (12, 35% of all platforms), and manufactured of a variety of raw materials. Retouched platforms of conchoidal silicified wood, fossiliferous San Juan chert, quartzite, and High Surface quartzitic sandstone were all identified. Of these retouched platforms, one was utilized, indicating that the resharpening of a conchoidal silicified wood tool occurred. The presence of resharpening flakes is generally viewed as reflecting the maintenance of tools, typically occurring either at the location of use or at a residence.

These data suggests that at least four formal tools were manufactured at this location, and at least one tool was resharpened. The only formal tool recovered from this provenience was one biface, manufactured of fossiliferous San Juan chert. This suggests that although this biface could have been manufactured and possibly used at this location, other formal tools were removed after manufacture.

More expedient tools were also recovered, and support the suggestion that tools were used at this location. One tool, unidirectionally retouched on the margin and made of fossiliferous San Juan chert, was also recovered. This tool exhibited unidirectional scars and rounding, suggesting use in scraping. In addition, three flakes exhibited use-wear along an unmodified edge. Two of these exhibited unidirectional rounding (conchoidal silicified wood and fossiliferous San Juan chert), and one exhibited unidirectional scars and rounding (conchoidal silicified wood). Since all of the expedient flake tools exhibit unidirectional use-wear, we can assume that scraping was of primary importance within this provenience.

Provenience 4 • Subsurface artifacts recovered from excavations within the southern artifact scatter are summarized as Provenience 4. Eleven artifacts were recovered from subsurface tests in this area. They include ten flakes and one biface. The majority of these artifacts were manufactured of conchoidal silicified wood (9 artifacts, 82%). The other two items were manufactured of splintered silicified wood and of High Surface gravel.

Percentages of dorsal cortex and cortical platforms mimic the surface assemblage. The vast majority (70%) of the flakes lacked any dorsal cortex at all, and only one flake of conchoidal silicified wood exhibited a cortical platform.

Evidence of later stages of reduction, formal tool manufacture, and tool use is essentially absent. The presence of a single biface manufactured of successfully heat-treated conchoidal silicified wood is suspected to be a manufacturing failure, and is difficult to interprete without additional excavation in this provenience. No expedient tool types were recovered from the test excavations.

Summary

Lithic data from both the northern artifact scatter and the southern artifact scatter suggest that a variety of activities occurred at this site, and that these activities were spatially distinct in many cases. The assemblage in the northern artifact scatter indicates raw material acquisition and decortication. High Surface gravels exhibit evidence of decortication and secondary reduction. Banded chalcedony exhibits more evidence of secondary reduction, although some decortication is indicated. Although one biface may have been manufactured and discarded in the northern scatter area, evidence for extensive tool manufacturing and use of tools is absent. A small scatter of fire-cracked rock was identified in this area but it is unclear what this feature may have been used for.

The southern scatter exhibits a very different pattern, with secondary reduction, tool manufacture, and tool use being emphasized. Within this area, at least four formal tools were manufactured, and one was resharpened. In addition, four expedient flake tools are present. All of these were utilized in scraping.

The assemblage at FA 2-18 indicates that a variety of activities occurred. These include the procurement and decortication of raw materials, the use of heating elements in a hearth-related activity, the manufacture of both formal and expedient tools, and the use of expedient tools in scraping. The presence of the dart point manufactured of yellow silicified wood may indicate that hunting occurred near this site.

FA 2-19

FA 1-19 consists of a sparse lithic and groundstone scatter, and a broken pot. The pot is Mancos-black-on white, which dates ca. A.D. 950-1150 (Raish, this volume). No radiocarbon dates were recovered from the site.

Eleven lithic artifacts were recovered from the site. These artifacts include seven flakes, two cores, one axe and one metate fragment. The majority of artifacts were manufactured from intermediate granitic (four artifacts). Other materials included melaphyre (two artifacts), other igneous (two artifacts), hornfels (two artifacts), and High Surface fossiliferous chert (one artifact).

The lithic artifacts were all recovered from the surface of the site and are described as a single provenience.

Evidence for primary reduction was found among the intermediate granitics and High Surface fossiliferous cherts. Other material classes, however, lacked cortex. The low counts within each material category provide little information about reduction technology. Two melaphyre cores were also recovered. One multiplatform core exhibited cortex in the 26-75% range, and the other was a tested core with up to 75% cortex.

Other artifacts included a metate and an axe fragment. The metate was manufactured from other igneous and the axe from hornfels. No other tools or evidence of tool use was identified on the site.

Site Summary

The relative paucity of lithic material on the site limits interpretation. The metate and the axe may represent artifacts left for later use.

FA 3-3

Site FA 3-3 represents one of the four sites selected for excavation from the Farmington portion of the Elena Gallegos project. The site consists of a lithic, ceramic, and groundstone scatter with seven hearths (Features

1, 2, 4, 5, 8, 10, and 11), three roasting pits (Features 3, 7, and 9), two small ash stains (Features 12 and 17), one large ash stain (Feature 18), a pitstructure with an interior hearth (Features 13 and 15), a post hole (Feature 14), and a fire-cracked rock/ash midden (Feature 6) (Raish, this volume).

The site is is a multicomponent seasonal habitation and special-use locus, with ample evidence of occupation extending over a considerable time span. Radiocarbon dates and pottery types indicate major periods of occupation from the Basketmaker II through Pueblo II periods, with incidental later visits to the site area.

A total of 261 lithic artifacts was recovered from this site. These include 223 flakes, 24 cores, 4 groundstone items, 2 projectile points, 2 bifaces, 1 uniface, 1 hammerstone, and 2 pieces of small angular debris. Also recovered were a wedge and a knapper. The majority of artifacts were manufactured from intermediate granitics (61 artifacts), quartzite (57 artifacts), San Juan fossiliferous chert (34 artifacts), High Surface gravels (26 artifacts), Morrison light chert (18 artifacts), and Morrison gray chert (16 artifacts). Other material types include High Surface quartzitic sandstone (11 artifacts), hornfels (8 artifacts), sandstone (8 artifacts), High Surface fossiliferous (8 artifacts), conchoidal wood (4 artifacts), Brushy Basin chert (4 artifacts), yellow wood (3 artifacts), and one artifact each from splintered wood, other chert, and Moss jasper.

Mapping of the site identified 9 discrete activity loci within an area measuring 50 m. N/S by 38 m. E/W. Locus 1 was located in the southeastern portion of the site and contained Feature 1, a cobble-ring hearth. Locus 2 was situated in the southwestern portion of the site and encompassed a hearth (Feature 2). Locus 3, between Loci 1 and 2, in the southern section of the site, consisted of a lithic, groundstone, and ceramic scatter. Locus 4, located in the extreme north-central portion of the site, encompassed three features: an oval-shaped roasting pit (Feature 3), a hearth (Feature 11), and a post hole (Feature 14). Four to six meters east of Locus 4, Locus 5 consisted of two small ash stains (Features 12 and 17), and a larger ash stain (Feature 18), containing lithics, ceramics, and burned bones. A cobble-ring hearth (Feature 4) was also present within this locus. Locus 6 was located in the northeastern portion of the site, and consisted of a scatter of lithics, ceramics, and groundstone; and four features: a pitstructure (Feature 13), a fire-cracked rock and ash midden (Feature 6), a roasting pit (Feature 7), and a cobble-ring hearth (Feature 5). Locus 7 was situated in the extreme northwestern portion of the site and contained a hearth (Feature 8). Locus 9, in the center of the site, encompassed a small sherd and lithic scatter associated with Feature 10 (hearth). Finally, Locus 10, located in the extreme southwestern corner, consisted of a hearth (Feature 9), and associated ceramics. No lithics were recovered from this locus.

For analytical purposes, the site was divided into a northern half and a southern half. Provenience 1 represents surface artifacts collected from the southern half, and Provenience 2 is those artifacts collected from the surface in the northern half. Provenience 3 contains those subsurface artifacts recovered from excavations in the southern half (Loci 1, 2, 3, 10). Provenience 4 represents subsurface artifacts from the northern portion of the site (Loci 4, 5, 6). Artifacts recovered from excavation in the center of the site (Locus 9) are designated Provenience 5. Provenience 6 represents excavations in the western portion of the site (Locus 7). No lithic artifacts, however, were recovered from these excavations in Locus 7. The lithic assemblages are described by provenience below.

Southern Half of Site

Provenience 1 • A total of 83 lithic artifacts was recovered from the surface of this half of the site. An additional four lithic artifacts were recovered from the excavations within Loci 1, 2, 3, and 10 (Provenience 3). The surface artifacts included 68 flakes, 13 cores, a hammerstone, and a groundstone item. Most of these artifacts were manufactured from intermediate granitics (39 artifacts), quartzite (20 artifacts), and sandstone (8 artifacts). Other material types included San Juan fossiliferous (5 artifacts), Morrison light chert (5 artifacts), hornfels (2 artifacts), and High Surface quartzitic sandstone (2 artifacts). Three additional artifacts were manufactured from three different materials, all locally available.

Dorsal cortex on the debitage suggests that there was both primary and secondary reduction in this area. Eighty-one percent of the flakes exhibited varying amounts of dorsal cortex, with 36% falling in the range from 51-100%.

Further evidence of primary reduction is indicated by the 13 cores recovered. These cores were manufactured from intermediate granitics (six cores), quartzite (four cores), and hornfels, sandstone, and San Juan fossiliferous chert (one from each). The cores included the following varieties: six single-platform regular, four bifacial regular, two multiplatform regular, and one tested. Fifty-four percent exhibited high proportions of cortex (51-75% and 76-99%). Two of the bifacial cores exhibited secondary use as choppers.

Although no evidence of formal tool manufacture and use was recovered, expedient tool-use is indicated. Two flakes, one of Brushy Basin chert and the other of San Juan fossiliferous chert exhibited unidirectional scars and use-wear indicating scraping.

Other artifacts found in this area include a quartzite hammerstone and a quartzite one-hand mano. The single piece of groundstone suggests that vegetal processing occurred in this half of the site.

Provenience 3 • Excavation within Loci 1, 2, 3, and 10 recovered three flakes and a mano. Two of the flakes were manufactured from quartzite and one was of hornfels. The mano was made from intermediate granitics.

Two of the flakes exhibited dorsal cortex in the 1-25% range. One quartzite flake lacked dorsal cortex.

The single piece of groundstone recovered provides further evidence of vegetal processing within this half of the site. This was a whole mano, of the one-hand variety.

Northern Half of Site

Provenience 2 • Twenty-three lithic artifacts were recovered from the surface of this portion of the site. The surface artifacts included 16 flakes and 7 cores. These artifacts were manufactured from intermediate granitics (ten artifacts), quartzite (seven artifacts), hornfels (three artifacts), Brushy Basin chert (two artifacts), and Morrison light chert (one artifact).

Debitage characteristics suggest both primary and secondary reduction within this half of the site. Seventy-four percent of the flakes (eleven) exhibited varying degrees of dorsal cortex.

Further evidence of primary reduction is given by the seven cores recovered. These include four multiplatform regular cores, two tested cores, and one bifacial regular core. Five of the cores were manufactured from intermediate granitics, one was of quartzite, and the last was made from High Surface gravels. The two tested cores, one of intermediate granitics and one of quartzite, appear to indicate that these raw materials occur close by, as these artifacts typically are found at material acquisition loci. None of these cores exhibited any form of secondary usage as tools or grinding implements.

No evidence of expedient tool-use or formal manufacture was recovered within the surface assemblage of this half of the site. Also lacking was evidence of vegetal processing.

Northern Part of Site

Provenience 4 (Loci 4, 5, 6) • Excavations within the loci in the northern portion of the site recovered a total of 146 lithic artifacts. These included 132 flakes, 4 cores, 2 projectile points, 2 bifaces, 2 groundstone items, 1 uniface, and 1 wedge. Two pieces of small angular debris were also recovered. The majority was manufactured from quartzite (27 artifacts), San Juan fossiliferous chert (27 artifacts), and High Surface gravels (26 artifacts). Other material types included Morrison gray chert (14 artifacts), intermediate granitics (12 artifacts), Morrison light chert (11 artifacts), High Surface quartzitic sandstone (99 artifacts), and High Surface fossiliferous (8 artifacts). An additional twelve artifacts were made from six different locally-available materials.

Debitage characteristics indicate that both primary and secondary reduction occurred within this area. Fifty percent of the flakes lacked dorsal cortex while the remaining 50% exhibited varying degrees of dorsal cortex. Sixty-eight percent of those with dorsal cortex exhibited amounts greater than 26%.

Primary reduction is further indicated by the four cores recovered, which exhibited medium to high proportions of cortex. These cores include two regular single platform cores of intermediate granitic rock and quartzite, an exhausted single platform core of San Juan fossiliferous chert, and a San Juan fossiliferous tested core. The quartzite single platform core also exhibited secondary usage as a knapper.

Although none of the debitage recovered exhibited retouched platforms, some formal tool manufacture may have occurred in this area. Two projectile points with basal snaps and two biface fragments in the blank stage of manufacture were recovered. No use-wear was recorded on any of these artifacts. All four artifacts also exhibited sucessful heat treatment; two were successfully heat-treated from the core. A uniface exhibiting unidirectional hard wear, indicating scraping, was also recovered. No evidence for expedient tool-use was noted.

Vegetal processing was indicated by the two groundstone fragments. Both were manufactured from quartzite: a one-hand mano and an indeterminate piece of groundstone. One wedge made from conchoidal wood was also recovered.

The abundant evidence for a variety of activities in this portion of the site suggests a longer-term occupation. The intensity and diversity in the activities represented correspond to the structural features present.

Center of Site

Provenience 5 (Locus 9) • Five flakes were recovered from excavations within Locus 9. Two of the flakes were manufactured from Morrison gray chert, two from San Juan fossiliferous chert, and one from Morrison light chert. One of the flakes lacked dorsal cortex, while the remaining four exhibited varying ranges of cortex. None of the flakes exhibited retouched platforms and no expedient tool-use was evident on any of the flakes.

Summary

The lithic assemblage recovered from this site indicates a variety of activities. Both primary and secondary reduction is evident in all proveniences. Vegetal processing is indicated in the southern half of the site, and within Loci 4, 5, and 6 (Provenience 4). Evidence for expedient tool-use in scraping is present in the southern half of the site. Formal tool manufacture is evident in the north half of the site within Loci 4, 5, and 6 (Provenience 4). The intensity and diversity of activities represented in the northern portion of the site suggest a longer-term occupation, corresponding to the structural features present. Those activities represented in the southern half of the site suggest that it was a short-term, special-use locus.

FA 3-6

FA 3-6 was one of the four sites selected for excavation. The site consisted of a scatter of lithics, ceramics, groundstone, and fire-cracked rock, with a diffuse surface ash stain. Four radiocarbon dates were obtained from Locus 1 and indicate occupation between A.D. 355 and 1415 (Basketmaker II - Pueblo IV). The midpoints of the radiocarbon dates in combination with the ceramics recovered indicate that major uses of the site occurred from the Basketmaker III through early Pueblo II periods (Raish, this volume).

A total of 1272 lithic artifacts was recovered from this site. These artifacts included 1092 flakes, 66 pieces of small angular debris, 36 pieces of groundstone, 21 cores, 12 bifaces, 6 hammerstones, 4 projectile points, 4 pieces of large angular debris, 4 unifaces, and 1 drill. An additional 26 lithic artifacts were also recovered and classified as other. These included 13 unmodified rocks, 4 hammerstone/core flakes, 2 retouched rocks, 1 wedge and 1 denticulate. All artifacts, with the exception of a projectile point and a uniface, were manufactured from locally-available materials. The majority of these artifacts were made from High Surface gravels (256 artifacts), conchoidal wood (218 artifacts), intermediate granitic rock (124 artifacts), yellow wood (99 artifacts), and quartzite (77 artifacts). Other materials include Morrison mottled chert (70 artifacts), San Juan fossiliferous chert (65 artifacts), Moss Jasper (51 artifacts), splintered wood (48 artifacts), banded chalcedony (38 artifacts), undifferentiated black chert (34 artifacts), breccia (28 artifacts), sandstone (26 artifacts), other metamorphics (21 artifacts), High Surface quartzitic sandstone (17 artifacts), melaphyre (18 artifacts), palm wood (20 artifacts), Morrison gray chert (14 artifacts), High Surface fossiliferous (11 artifacts), hornfels (9 artifacts), other igneous (6 artifacts), Brushy Basin chert (4 artifacts), and other chert (4 artifacts). The two artifacts manufactured from non-local materials were a Polvadera obsidian projectile point and a uniface of vitrophyre basalt. The closest known sources for this basalt are the No Aqua and San Antonio Mountains west of Quemado, and the Cochiti area.

The site area encompassed three discrete artifact scatters. Provenience 1 consisted of a moderately dense artifact scatter located in the northeast corner of the site. Provenience 2 (designated Locus 1 during the testing) was located in the center of the site and consisted of a dense artifact concentration, two ash features (Features 4 and 5) within a larger diffuse stain, fire-cracked rock, and a cobble concentration. All four radiocarbon dates came from this provenience. Subsurface artifacts recovered from within this provenience were designated Provenience 4. Provenience 3 (designated Locus 2 during the testing) was located 50 m. southwest of Provenience 2 and consisted of a low-density lithic, cobble, and fire-cracked rock scatter, with two Mancos Corrugated sherds. Subsurface artifacts recovered from the excavations within this area were designated Provenience 5. The lithic assemblage for each provenience is described below.

Northeast Scatter

Provenience 1 • A total of 156 lithic artifacts was recovered from the surface of this northeast scatter, the majority being pieces of lithic debitage (129 flakes and 6 small pieces of angular debris). Other artifacts recovered include three bifaces, eight pieces of groundstone, three cores, and one projectile point. Two unmodified rocks and five fire spalls were also found. All these artifacts were manufactured from locally-available raw materials. The majority were of High Surface gravels (41 artifacts) and conchoidal wood (31 artifacts). Other material types included yellow wood (13 artifacts), San Juan fossiliferous chert (12 artifacts), Moss Jasper (9 artifacts), banded chalcedony (9 artifacts), intermediate granitics (7 artifacts), Morrison mottled chert (7 artifacts), sandstone (5 artifacts), quartzite (3 artifacts), High Surface fossiliferous (3 artifacts), and splintered wood (3 artifacts). An additional ten artifacts were manufactured from nine different raw materials.

Dorsal cortex and platform types indicate that mostly secondary reduction occurred in this area, although some primary decortication is evident. Sixty-nine percent of the flakes (89 artifacts) lacked dorsal cortex and only 13 flakes (16%) had cortical platforms.

Three cores, a regular single-platform core and two regular multiplatform cores, exhibiting low-to-medium proportions of cortex, were also recovered. Two were manufactured from hornfels and one was made from conchoidal wood. The single platform core exhibited evidence of battering, indicating secondary use as a pecking stone.

Formal tool manufacture is indicated by 19 flakes exhibiting retouched platforms. Seven of these were also ground, suggesting platform preparation, and one was utilized, indicating possible resharpening. These flakes were manufactured from High Surface gravels (five artifacts), conchoidal wood (five artifacts), yellow wood (four artifacts), and San Juan fossiliferous chert, banded chalcedony, splintered wood, palm wood, and Morrison mottled chert (one flake from each). Three biface fragments in late stages of manufacture were recovered from this area. Two were manufactured from conchoidal wood and one was of Morrison mottled chert. A San Rafael projectile point of conchoidal wood was also recovered. Two of the bifaces and the projectile point were successfully heat treated. None of these tools exhibited any use-wear. No formal tools of the other materials were present; they may have been carried away.

Two flakes also exhibited evidence of expedient tool-use. Scraping was indicated by two flakes of San Juan fossiliferous chert, one having unidirectional scars and rounding.

Vegetal processing in this area is indicated by eight pieces of groundstone. These represent a minimum of seven grinding implements: one basalt trough metate, two two-hand sandstone manos, three sandstone metates, and one mano of unknown quartzite.

The abundant evidence for a variety of activities in this portion of the site suggests a longer-term occupation. The intensity and diversity in activities present in this area of the site suggest multiple seasonal special-use loci.

Center of Site (Including Test Locus 1)

Provenience 2 • A total of 414 artifacts was recovered from the surface of this portion of the site. An additional 677 artifacts were recovered from excavations within the test Locus 1. The surface artifacts included 361 flakes (2 bipolar), 21 pieces of small angular debris, 8 cores, 8 groundstone pieces, 3 pieces of large angular debris, 3 bifaces, 3 hammerstones, 1 projectile point, and 1 uniface. Five other artifacts were classified as other, including one denticulate. The majority of artifacts were manufactured from High Surface gravels (105 artifacts), conchoidal wood (66 artifacts), quartzite (31 artifacts), yellow wood (22 artifacts), banded chalcedony (22 artifacts), and intermediate granitics (22 artifacts). Other material types included San Juan fossiliferous chert (18 artifacts), Moss Jasper (17 artifacts), Morrison mottled chert (16 artifacts), splintered wood (14 artifacts), undifferentiated black chert (13 artifacts), and melaphyre (13 artifacts). An additional 46 artifacts were manufactured from primarily locally-available cherts and silicified woods. Two artifacts were made from non-local materials - Polvadera Peak obsidian and vitrophyre basalt.

Debitage characteristics indicate secondary reduction, with some primary decortication also present. Two hundred and twenty-two flakes (61%) lacked dorsal cortex, and 133 (49%) exhibited single-facet platforms. Fifty-seven flakes (21%) had cortical platforms.

Further evidence of primary reduction is indicated by the eight cores recovered. These include 2 regular multiplatform, 2 regular single platform, 2 exhausted single platform, 1 exhausted multiplatform, and 1 tested core. Two were manufactured from quartzite, 2 were of melaphyre, and one each was made from conchoidal wood, San Juan fossiliferous chert, High Surface gravel, and basalt. A single platform core also exhibited evidence of battering suggesting use as a pecking stone. Two bipolar flakes were also recovered, indicating reduction of small nodules.

Evidence for formal tool manufacture is indicated by 32 flakes exhibiting retouched platforms. Six of these platforms were also ground, suggesting platform preparation, and three were utilized, indicating resharpening occurred. Sixteen of these flakes (three ground and two utilized) were manufactured from conchoidal wood, seven (one ground) were of yellow wood, four (one ground) were made from High Surface gravels, two (one ground) were of palm wood, and one each was made from quartzite, High Surface fossiliferous, and High Surface quartzitic sandstone (utilized). Two biface fragments of conchoidal wood, one in the early stage and one in late stage of reduction, were recovered. Both of these were successfully heat treated. One other biface fragment in the early stage of reduction and manufactured from High Surface gravel was also recovered. No formal tools of the other material types were recovered, suggesting that they were carried away.

Other tools recovered included a conchoidal wood denticulate fragment, a vitrophyre basalt uniface, and a San Pedro projectile point of Polvadera obsidian. Denticulates are artifacts that exhibit prominences resembling teeth similar to a saw blade. No use-wear was observed, making the function of this piece difficult to ascertain. The uniface exhibited unidirectional, hard use-wear, suggesting use in scraping on a hard medium. Such wear patterns can result from bone and wood working (Schutt 1980). The projectile point was complete, and consistent with the earlier occupation of the site, though not manufactured in this location.

Evidence for expedient tool-use is also present within this area. Five retouched flakes and 27 flakes exhibiting use-wear were recovered. These were manufactured primarily from various woods, cherts, and chalcedonies. Twenty-four exhibited use-wear, indicating scraping, and eight had use-wear suggesting cutting.

Vegetal processing was evidenced by eight groundstone fragments, representing a minimum of six grinding implements, all of sandstone. These included two one-hand manos, one two-hand mano, one unknown mano, one basin metate, and one grinding slab.

Three hammerstones were also recovered. Two were manufactured from quartzite and one was made from intermediate granitic rock.

Provenience 4 (Test Locus 1) • A total of 677 lithic artifacts was recovered from excavations within test Locus 1. These artifacts included 588 flakes (1 bipolar), 39 pieces of small angular debris, 15 groundstone items, 7 bifaces, 6 cores, 3 unifaces, 2 hammerstones, a drill, a wedge, and a piece of large angular debris. Fourteen other artifacts were also classified as other, which included a retouched rock, three unmodified rocks, and fire spalls. Most of these artifacts were manufactured from conchoidal wood (119 artifacts), High Surface gravels (111 artifacts), intermediate granitics (83 artifacts), yellow wood (64 artifacts), Morrison mottled chert (47 artifacts), and quartzite (41 artifacts). Other material types included San Juan fossiliferous (34 artifacts), splintered wood (31 artifacts), Moss Jasper (24 artifacts), breccia (22 artifacts), undifferentiated black chert (20 artifacts), other metamorphic (15 artifacts), palm wood (13 artifacts), High Surface quartzitic sandstone (11 artifacts), and sandstone (10 artifacts). An additional 32 artifacts were manufactured from 9 different locally-available materials.

Dorsal cortex and platform types indicate secondary reduction, with some primary decortication also occurring. Seventy-two percent (432 flakes) of the debitage lacked dorsal cortex and 50% (195 flakes) exhibited single-facet platforms. Twenty-seven percent (156 flakes) of the debitage exhibited varying degrees of dorsal cortex, and 55 (14%) had cortical platforms.

Further evidence of primary reduction is given by the six cores recovered. Three were manufactured from High Surface gravels, two from Morrison mottled chert, and one from intermediate granitic rock. The cores consisted of the following types: two multiplatform exhausted, one regular multiplatform, one regular single platform, and two tested. All exhibited medium to high percentages of cortex, with the exception of the two exhausted cores. The two tested cores, one from Morrison mottled chert and the other from High Surface gravels, appear to indicate that the raw materials are close by, as these artifacts typically occur at material acquisition loci. None of these cores exhibited any form of secondary use as tools or grinding implements. One bipolar flake was also recovered, suggesting that a small nodule was reduced in this area. Two hammerstones, one of splintered wood and one of quartzite, were also recovered.

Evidence for formal tool manufacture or resharpening is indicated by 104 flakes with retouched platforms. Thirteen of these platforms had evidence of grinding, which suggests platform preparation, and three were utilized, indicating resharpening. Similar to the surface assemblage, the majority of these flakes were woods (60 flakes, 58%), and cherts and chalcedonies (40 flakes, 38%). Three conchoidal wood biface fragments, one in the late stage of manufacture and two in the early stage of manufacture, were recovered. Two conchoidal wood uniface fragments, one in the late stage of manufacture and one functionally complete, were also recovered. All five of these artifacts had been successfully heat-treated. Other formal tools recovered included an early-stage biface fragment of yellow wood exhibiting successful heat treatment, an early-stage biface fragment of High Surface gravels, a biface blank of Morrison mottled chert exhibiting successful heat treatment, and an early-stage bifacial tool of splintered wood, which also exhibited successful heat treatment. A bifacial drill of Morrison mottled chert and a conchoidal wood wedge were also present. Both of these artifacts exhibited successful heat-treatment. No use-wear was evident on any of these formal tools.

Evidence for expedient tool-use was also identified in this area. Three retouched flakes, and 15 unmodified flakes (including the bipolar flake), exhibited use-wear, indicating both cutting (7 flakes) and scraping (11 flakes). Eighty-nine percent of these flakes (16 artifacts) were manufactured from woods, cherts, and chalcedonies.

Other artifacts recovered include 15 groundstone fragments, representing a minimum of 12 grinding implements. These include five one-hand sandstone manos, two unknown quartzite manos, one unknown quartzite groundstone fragment, and one unknown sandstone groundstone fragment. These grinding implements indicate vegetal processing within this locus.

The abundant evidence for a variety of activities in this portion of the site suggests a longer-term occupation. The intensity and diversity of activities represented in this area of the site correspond to the structural features present.

Southeast Corner of Site (Including Test Locus 2)

Provenience 3 • Eight lithic artifacts were recovered from the surface of this area of the site. An additional 16 artifacts were recovered from excavations within Locus 2. The surface artifacts included three flakes, three cores, one biface, and one mano. Three of these artifacts were manufactured from intermediate granitics, and one artifact each was made from conchoidal wood, other chert, Moss Jasper, sandstone, and High Surface quartzitic sandstone.

The three flakes recovered were manufactured from other chert, intermediate granitic rock, and High Surface quartzitic sandstone. Two of the flakes exhibited cortex in the 1-25% range, and one lacked dorsal cortex. Two flakes had cortical platforms.

Of the three cores recovered, two were tested rocks of intermediate granitic and Moss Jasper, and the third was a regular single platform of intermediate granitic. Cortex ranges were 26-50% on two, and 51-75% on the third. Though limited in number, this small flake and core assemblage suggests that primary decortication and secondary reduction occurred in this area.

A single flake of intermediate granitic rock exhibited a retouched platform, suggesting that a formal tool may have been manufactured or resharpened in this area. No formal tool of this material was recovered, indicating that it may have been carried away. A fragment of a conchoidal wood bifacial tool was recovered, however. This tool was functionally complete but exhibited no use-wear.

The area exhibited no evidence of expedient tool-use. Vegetal processing was indicated by a single one-hand sandstone mano.

Provenience 5 (Excavation in Test Locus 2) • A total of 16 lithic artifacts was recovered from excavations within Test Locus 2. These artifacts include eleven flakes, three groundstone pieces, one core, and one hammerstone. The majority of these artifacts were manufactured from intermediate granitics (nine) and Brushy Basin chert (three). The remaining four artifacts were made from San Juan fossiliferous chert, other chert, quartzite, and sandstone.

Debitage characteristics indicate that both primary decortication, though limited, and secondary reduction occurred in this Locus. Four of the flakes (37%) exhibited varying degrees of dorsal cortex and 38% had cortical platforms.

A regular multiplatform core of intermediate granitics was recovered. The core exhibited a cortex range of 26-50%. No evidence of secondary use as a tool or grinding implement was noted. Also recovered was a quartzite hammerstone.

There was no evidence for formal tool manufacture or resharpening within this assemblage. Also lacking was evidence for expedient tool-use. Vegetal processing was indicated by groundstone fragments. Two grinding implements were represented by the three groundstone fragments, a one-hand sandstone mano and an unknown mano of intermediate granitic rock.

The limited variety of activities within this portion of the site suggests a short-term occupation. The intensity and diversity in activities is not as great as in the other areas of the site, indicating that this portion of the site was probably a limited-use locus.

Summary

Lithic, ceramic, and radiocarbon data from this site suggest multiple occupational episodes. The lithic assemblage exhibits evidence for a variety of activities associated with special-use loci. Secondary reduction with limited primary decortication is evident in all areas. Both freehand and bipolar techniques were used. Evidence for the manufacture and resharpening of formal tools is present in all areas, but with greatest intensity centered in Locus 1. Successful heat-treating of materials was also evident. The evidence for expedient tool-use in Proveniences 1, 2, and 4 indicates that both cutting and scraping occurred in these areas. Vegetal processing was evident in all areas of the site. The diversity and intensity of activities represented suggest multiple seasonal occupations of the site.

FA 5-1

FA 5-1 lies on a small knoll and consists of a scatter of lithic debris and groundstone of unknown age. A single hearth was identified near the groundstone, and one sherd was found to the east in a small wash.

Lithic artifacts that were recovered from the site totaled 109. These were collected from the surface of the site with the exception of a single flake that was found in a shovel test pit. These artifacts are described together and included 89 flakes, 1 small piece of angular debris, 4 bifaces, 4 cores, 4 manos, and two fire spalls. These lithics were manufactured from a wide variety of raw materials (18 types). Nineteen percent of these were manufactured from intermediate granitics (17 artifacts), while 14% of the assemblage was yellow silicified wood (13 artifacts). Quartzite and hornfels made up ten percent respectively (nine artifacts). The remaining 13 material types each represented less than 10% of the entire assemblage. All materials that were recovered from the site can occur locally.

Scatter diagrams were used to plot artifacts across the site and identify potential activity locations. These plots defined one lithic concentration (Provenience 1) which measured 16 m. N/S by 25 m. E/W, and a sparse scatter of background artifacts (Provenience 2). A total of 90 lithics was recovered from Provenience 1, and 2 artifacts from Provenience 2. All materials were recovered from the surface except a single flake that was recovered from a shovel test pit.

Provenience 1 (Lithic Concentration)

Ninety lithic artifacts were recovered from the lithic concentration. These artifacts included 75 flakes and pieces of small angular debris, 4 bifaces, 4 cores, 4 manos, and 2 fire spalls. The lithics were manufactured from a wide variety of locally-available materials.

The debitage from this provenience is characteristic of both primary decortication and secondary reduction, in addition to formal tool manufacture. It is apparent that the intermediate granitic materials underwent primary decortication as well as secondary reduction at the site. The presence of a single flake with a retouched platform suggests that a formal tool was either manufactured or resharpened at the site. The yellow silicified wood on the other hand was probably brought to the site as prepared cores. Seventy-five percent of the assemblage lacked cortex, and the remaining 25% exhibited less than 25% dorsal cortex. The presence of three retouched platforms within this material class suggests that formal tool manufacture occurred at the location. Evidence for formal tool manufacture was found among black chert, quartzite, hornfels, and other silicified woods. Four of the retouched platforms exhibited evidence of grinding that is typical of platform preparation. No utilized platforms were identified.

Four cores were recovered from the site. Two were manufactured from intermediate granitic materials (a multiplatform core and a tested core). Two additional exhausted multiplatform cores were manufactured from Brushy Basin chert and from black chert. The presence of a tested intermediate granitic core is consistent with evidence from dorsal cortex that primary reduction occurred at the site.

Five flakes exhibited wear patterns which indicate that scraping occurred at the site. Two flakes of conchoidal wood exhibited unidirectional scars and rounding on unretouched edges. Three retouched flakes also exhibited evidence of scraping. One was manufactured from yellow silicified wood, a second from Brushy Basin chert, and a third from gray Morrison chert. There was no evidence of cutting.

Four formal tools were also recovered from the site. They included two biface blanks and two early bifaces. All of these tools were manufacturing failures, and were discarded due to breakage or flaws in the raw material. One biface blank was manufactured from splintered silicified wood and the other from fossiliferous chert. The early bifaces were manufactured from undifferentiated Morrison chert and conchoidal silicified wood. With the exception of the blank manufactured from splintered silicified wood all materials exhibited successful heat treatment.

Vegetal processing is indicated by four one-hand manos that were recovered near the hearth. Three of these manos were manufactured from sandstone and one from quartzite.

Provenience 2 (Background Lithics)

Two additional flakes were recovered from the surface of the site (Provenience 2). One was manufactured from intermediate granitics, the other from conchoidal wood. Both flakes had single-facet platforms, and dorsal cortex in the 1 to 25% range. No other lithic materials were recovered.

Summary

The lithic materials that were recovered from FA 5-1 represent a variety of tool manufacturing technologies. Both expedient and formal tool manufacture are represented. Although primary decortication of intermediate granitic materials occurred at the site, yellow silicified wood was brought in as prepared cores. The presence of two biface blanks and two early bifaces support other evidence that formal tools were manufactured at the site. It is also apparent that raw materials were heat-treated to facilitate tool manufacture.

Evidence of activities is limited to scraping and vegetal processing. Wear patterns on chipped stone did not provide evidence of cutting.

FA 5-2

FA 5-2 consists of 11 small loci of lithic artifacts concentrated in bowls in the caprock. No dates were recorded for this site.

A total of 3798 lithic artifacts was recovered from this site. These artifacts included 2993 flakes (425 bipolar), 794 pieces of small angular debris, 8 cores, 1 biface, 1 uniface, and a retouched rock. Most of these were manufactured from High Surface gravels (1283 artifacts) and conchoidal wood (1256 artifacts). Other material types included yellow wood (379 artifacts), splintered wood (360 artifacts), San Juan fossiliferous chert (296 artifacts), High Surface fossiliferous chert (100 artifacts), Morrison gray chert (40 artifacts), breccia (14 artifacts), Brushy Basin chert (12 artifacts), and quartzite (9 artifacts). The remaining 49 artifacts were manufactured from 11 different locally-available materials.

Eleven discrete concentrations of lithics were mapped for this site. These concentrations were situated in shallow basin depressions in a slickrock outcrop, and were clustered in an area measuring 20 m. N/S by 13 m. E/W. Each concentration was designated a locus and all artifacts were collected. The assemblage from each locus was assigned a provenience number corresponding to the locus number. Each locus and provenience assemblage will be described below.

Provenience 1 (Locus 1)

Locus 1 is near the center of the site. It consisted of three shallow depressions within an area measuring 3 m. E/W by 2.5 m. N/S. This locus had the densest concentration of artifacts on the site, 2129 items.

As noted, a total of 2129 lithic artifacts was collected from the three shallow basins within this locus. These artifacts included 1697 flakes (104 bipolar), 422 pieces of small angular debris, 8 cores, 1 biface, and 1 uniface. More than 50% of these artifacts were manufactured from conchoidal wood (780 artifacts) and High Surface gravels (637 artifacts). Other material types included splintered wood (253 artifacts), yellow wood (243 artifacts), San Juan fossiliferous chert (96 artifacts), High Surface fossiliferous chert (48 artifacts), Morrison gray chert (29 artifacts), breccia (14 artifacts), moss jasper (5 artifacts) and Morrison mottled chert (5 artifacts). The remaining 14 artifacts were made from 7 additional locally-available materials.

Dorsal cortex and platform types indicate secondary reduction with some primary decortication. Sixty-three percent of the debitage (1082 flakes) lacked dorsal cortex and 609 flakes (59%) had single facet platforms. Only 13% (135 flakes) exhibited cortical platforms.

Eight cores exhibiting low proportions of cortex were recovered from this locus. These cores include the following types: three exhausted multiplatform, two regular multiplatform, one regular single platform, and one tested. Material types are High Surface gravels (four), conchoidal wood (two), yellow wood (one), and Morrison gray chert (one). One hundred and four bipolar flakes were also recovered, suggesting that small nodules were reduced in this locus.

Nine flakes with retouched platforms were recovered, indicating formal tool manufacture or resharpening. These flakes were manufactured from conchoidal wood (three flakes), High Surface gravels (three flakes), splintered wood (two flakes), and breccia (one flake). No evidence of grinding or utilization was recorded on these flakes. Two formal tools of High Surface gravels were recovered. One was an early stage biface fragment and the other was a functionally complete uniface fragment. This latter artifact exhibited successful heat treatment. No formal tools from the other material types were recovered, suggesting that they were carried away.

Evidence for expedient tool-use is indicated by the eight retouched flakes, and by eight flakes, including two bipolar, exhibiting use-wear. All these artifacts had use-wear suggesting scraping.

No other activities were represented in this assemblage. The high number of pieces of small angular debris recovered in this locus is problematical. No other sites in the Farmington area with primary and secondary reduction exhibited this high percentage of small angular debris.

Provenience 2 (Locus 2)

Locus 2, located 1.25 m. southwest of Locus 1, consisted of a moderately-dense concentration of artifacts in a one-meter-diameter basin.

A total of 56 lithic artifacts was recovered from this locus. These include 44 flakes (1 bipolar) and 12 pieces of small angular debris. These artifacts were manufactured from High Surface gravels (33 artifacts), conchoidal wood (12 artifacts), yellow wood (7 artifacts), splintered wood (2 artifacts), Morrison tan chert (1 artifact), and Morrison gray chert (1 artifact).

Debitage characteristics indicate secondary, with limited primary decortication. Eighty-one percent of the debitage lacked dorsal cortex (36 flakes) and 81% exhibited single-facet platforms (13 flakes). A bipolar flake was also recovered from this area, suggesting that a small nodule was reduced.

No other activities were evident in this provenience. Again, the high frequency of small angular debris is problematical.

Provenience 3 (Locus 3)

Locus 3 was located 2.75 m. south of Locus 1. It consisted of two amorphously-shaped depressions covering an area measuring 3.75 m. N/S by 3.5 m. E/W. This locus contained the second largest concentration of lithic artifacts.

A total of 806 lithic artifacts was recovered from this area. These include 613 flakes (149 bipolar), 192 pieces of small angular debris, and 1 artifact classified as other. The majority of these artifacts were manufactured from High Surface gravels (350 artifacts), followed by conchoidal wood (261 artifacts). Other material types include splintered wood (51 artifacts), San Juan fossiliferous chert (47 artifacts), yellow wood (50 artifacts), High Surface fossiliferous chert (32 artifacts), and Morrison gray chert (5 artifacts). An additional ten artifacts were manufactured from six different locally-available marterials.

Dorsal cortex and platform types are characteristic of secondary reduction, with some primary reduction also. Seventy-two percent of the debitage items (443 flakes) lacked dorsal cortex, and 46% exhibited single-facet platforms (145 flakes). A total of 141 flakes (46%) exhibited collapsed platforms, and 40 flakes (11%) had cortical platforms. One hundred forty-nine bipolar flakes were also recovered, suggesting that small nodules were reduced in this locus.

Although no formal tools were recovered from this area, two flakes manufactured from High Surface gravels exhibited retouched platforms, suggesting that a formal tool had been manufactured or resharpened. No evidence of use was identified on these platforms.

No other activities were evident in this locus. Once again, the high frequency of small angular debris is problematical.

Provenience 4 (Locus 4)

Situated 2.5 m. northeast of Locus 3, Locus 4 contained a dense concentration of lithics clustered in an amorphously-shaped basin. This area measured, at its widest points, 2.25 m. N/S by 2 m. E/W.

A total of 191 lithic artifacts was recovered from this small area. These include 158 flakes (30 bipolar) and 33 pieces of small angular debris. The majority of these artifacts was manufactured from conchoidal wood (66 artifacts), High Surface gravels (47 artifacts), yellow wood (27 artifacts), splintered wood (20 artifacts), and San Juan fossiliferous chert (20 artifacts). Other material types include High Surface fossiliferous (four artifacts), Morrison gray chert (three artifacts), palm wood (two artifacts), other fossiliferous (one artifact), and sandstone (one artifact).

Debitage characteristics indicate secondary reduction. Sixty-three percent (99 flakes) lacked dorsal cortex, and 43% exhibited single-facet platforms (40 flakes). Thirty-five flakes (38%) had collapsed platforms and 15 flakes (16%) had cortical platforms. Reduction of small nodules in this locus is evidenced by the 30 bipolar flakes recovered.

A single flake of High Surface gravels exhibited a retouched platform with grinding, suggesting that a formal tool was manufactured in this locus. No formal tool of this material was recovered, though, indicating that it may have been carried away.

Evidence of expedient tool-use was indicated by a single retouched flake of High Surface gravels. The flake exhibited unidirectional scars, suggesting scraping.

No other activities were evident from the assemblage in this locus. The high frequency of small angular debris, once again, is problematical.

Provenience 5 (Locus 5)

Locus 5 was located 2.75 m. south of Locus 4. It consisted of a low-density cluster of artifacts in an oval-shaped basin measuring 1 m. N/S by .75 m. E/W.

Twenty lithic artifacts were recovered from this locus. These consisted of 14 flakes (4 bipolar) and 6 pieces of small angular debris. The majority of these were manufactured from High Surface gravels (eight artifacts), and conchoidal wood (six artifacts). Other material types included yellow wood (three artifacts), San Juan fossiliferous (two artifacts), and splintered wood (one artifact).

Dorsal cortex and platform type indicate secondary reduction. Eighty-five percent of the debitage (12 flakes) lacked dorsal cortex and 71% (5 flakes) exhibited collapsed platforms. It appears that decortication was done elsewhere. The four bipolar flakes suggest that small nodules were reduced in this area.

There was no evidence of formal tool manufacture or expedient tool-use. No other activities were indicated by this assemblage.

Provenience 6 (Locus 6)

Locus 6 was located in the southwest corner of the site. It consisted of a shallow depression measuring 3 m. in diameter containing a high density of artifacts.

A total of 257 artifacts was recovered from this locus. These included 176 flakes (62 bipolar) and 81 pieces of small angular debris. The majority of artifacts were manufactured from High Surface gravels (95 artifacts), conchoidal wood (66 artifacts), and San Juan fossiliferous chert (57 artifacts). Other material types included yellow wood (15 artifacts), splintered wood (11 artifacts), and other metamorphic (5 artifacts). An additional eight artifacts were manufactured of five different locally-available materials.

Dorsal cortex and platform type indicate secondary reduction. Seventy-seven percent of the debitage (134 flakes) lacked dorsal cortex, and 88% of the flakes exhibited collapsed or single-facet platforms. It appears that decortication occurred elsewhere. Reduction of small nodules is evidenced by the 62 bipolar flakes recovered from this locus.

There was no evidence of formal tool manufacture of expedient tool-use. No other activities were indicated by this assemblage. The high frequency of small angular debris in this locus is problematical.

Provenience 7 (Locus 7)

Locus 7 was situated 2.5 m. west of Locus 3. It encompassed two small depressions within an area measuring 1.25 m. N/S by 1 m. E/W. A low-density cluster of artifacts was present in this locus.

Thirteen flakes (three bipolar) and one piece of small angular debris were recovered from this locus. Most of the flakes were manufactured from High Surface gravels (nine artifacts). The remaining material types included San Juan fossiliferous chert (three artifacts), splintered wood (one artifact), and conchoidal wood (one artifact). Debitage characteristics indicate secondary reduction,with primary decortication occurring elsewhere. Sixty-nine percent of the debitage (nine flakes) lacked dorsal cortex, and 80% exhibited collapsed or single-facet platforms. The three bipolar flakes suggest that small nodules were reduced in this locus.

There was no evidence of formal tool manufacture in this area. Expedient tool-use was indicated by a single retouched flake of High Surface gravels with unidirectional scars. This suggests that scraping occurred in this area.

No other activities were represented in this assemblage. Again, the high frequency of small angular debris is problematical.

Provenience 8 (Locus 8)

Locus 8 was situated 4 m. north of Locus 7, and consisted of 35 artifacts clustered in two small circular depressions having diameters of .75 m. and .5 m.

Thirty-two flakes (eight bipolar) and three pieces of small angular debris were recovered from this provenience. These artifacts were manufactured from High Surface gravels (17 artifacts), yellow wood (9 artifacts), conchoidal wood (7 artifacts), San Juan fossiliferous chert (3 artifacts), and splintered wood (1 artifact).

Debitage characteristics indicate secondary reduction with primary decortication occurring elsewhere. Fifty-nine percent of the debitage (26 flakes) lacked dorsal cortex, and 84% exhibited collapsed or single-faceted platforms (16 flakes). Reduction of small nodules in this area is indicated by the eight bipolar flakes recovered.

No formal tool manufacture was represented in the assemblage nor was there any evidence of expedient tool-use. No other activities were indicated by the assemblage from this locus.

Provenience 9 (Locus 9)

Locus 9, 1.25 m. east/northeast of Locus 8, was comprised of a low-density cluster of artifacts within a kidney-shaped depression measuring 1.25 m. N/S by 0.6 m. E/W at its widest part.

Twenty-eight flakes (five bipolar) and nine pieces of small angular debris were recovered here. They were made from High Surface gravels (17 artifacts), yellow wood (9 artifacts), conchoidal wood (7 artifacts), San Juan fossiliferous chert (3 artifacts), and splintered wood.

Dorsal cortex and platform type indicate secondary reduction occurred in this area, with primary decortication elsewhere. Ninety-two percent of the debitage (26 flakes) lacked dorsal cortex, and none of the flakes exhibited cortical platforms. The five bipolar flakes recovered suggest that small nodules were reduced in this locus.

No formal tool manufacture was evident in this assemblage, nor was there any evidence of expedient tool-use. No other activities were indicated from the assemblage. The high frequency of small angular debris is, again, problematical.

Provenience 10 (Locus 10)

Locus 10 was an amorphously-shaped basin measuring 2 m. N/S by 1.25 m. E/W. It was located .75 m. northeast of Locus 9 and contained a moderately-dense cluster of artifacts.

Thirty-nine flakes (nine bipolar) and three pieces of small angular debris were recovered from this locus. Like Proveniences 8 and 9, the majority of these artifacts were manufactured from High Surface gravels (17 artifacts) and conchoidal wood (8 artifacts). Other material types included San Juan fossiliferous chert (seven artifacts), yellow wood (three artifacts), splintered wood (two artifacts), High Surface fossiliferous chert (two artifacts), quartzite (two artifacts) and Brushy Basin chert (one artifact).

Dorsal cortex and platform types indicate secondary reduction, with decortication elsewhere. Fifty-five percent of the debitage (21 flakes) lacked dorsal cortex, and 87% exhibited collapsed or single-facet platforms (15 flakes). The nine bipolar flakes recovered suggest reduction of small nodules in this locus.

No formal tool manufacture was indicated by the debitage nor was there any evidence of expedient tool-use. No other activities were indicated from the assemblage.

Provenience 11 (Locus 11)

This last area, Locus 11, was 2.25 m. northeast of Locus 10 in the northeast corner of the site. It was the largest of the depressions and measured 6 m. N/S by 4 m. E/W. This locus contained a dense cluster of artifacts.

A total of 211 artifacts was recovered from this area: 179 flakes (50 bipolar) and 32 pieces of small angular debris. The majority of these artifacts were manufactured from San Juan fossiliferous chert (60 artifacts), High Surface gravels (57 artifacts), conchoidal wood (38 artifacts), yellow wood (21 artifacts), and splintered wood (16 artifacts). Other material types included High Surface fossiliferous chert (twelve artifacts) and Brushy Basin chert (seven artifacts). An additional six artifacts were manufactured from three different locally-available materials.

Debitage characteristics indicate secondary reduction, with limited primary reduction. Sixteen flakes (14%) had cortical platforms, and 46% of the debitage exhibited varying degrees of dorsal cortex. Fifty bipolar flakes were also recovered, suggesting reduction of small nodules in this area.

Three flakes, two of conchoidal wood and one of yellow wood, exhibited retouched platforms, indicating that formal tools may have been manufactured or resharpened in this locus. No formal tools of these materials were recovered, suggesting that they may have been carried away.

Evidence for expedient tool-use came from a single bipolar flake of San Juan fossiliferous chert. This flake exhibited unidirectional scars, suggesting scraping.

No other activities were indicated by this assemblage. As with the majority of other proveniences, the high frequency of angular debris is problematical.

Summary

The high percentages of woods and cherts found on FA 5-2 is unique within the Farmington sites. All of the loci exhibited secondary reduction, with limited primary reduction in Proveniences 1, 2, 3, 4, and 11. Both freehand and bipolar techniques were present in all proveniences. Evidence of formal tool manufacture was recovered in Proveniences 1, 3, 4, and 11. Expedient tool-use was evident in Proveniences 1, 4, 7, and 11. Use-wear on these artifacts indicated that scraping was carried out in these four areas. No other activities were represented from the lithic assemblages. The high frequency of small angular debris within these assemblages is problematic. No other sites in the Farmington area with an emphasis on secondary reduction had this high of a percentage of small angular debris (20%). The site appears to represent a secondary reduction locus for the production of flakes for expedient tool-use. These flakes may also have been produced for transport to other locations for formal tool manufacture.

FA 5-3

FA 5-3 consists of a surface ceramic and lithic scatter dating to PII times, with some evidence of an occupation as early as PI and as late as PIII (Raish, this volume).

A total of 84 lithics was recovered from the site. These artifacts included 72 flakes, 6 cores, 2 bifaces, a denticulate, and a flake from a groundstone implement. These artifacts were manufactured from a wide variety of locally-available materials. As is typical on many sites in the Farmington area, the majority of materials consisted of intermediate granitic rock (32%). This material class was followed in frequency by San Juan fossiliferous chert (22%), hornfels (19%), quartzite (8%), and splintered silicified wood (8%). The remaining 12 artifacts were manufactured from five other locally-available materials.

Scatter diagrams were generated to plot the distribution of lithic materials. These plots identified a loosely spaced lithic concentration in the northeast (Provenience 1), and a second sparse scatter to the southwest (Provenience 2). The northeastern lithic concentration measured roughly 27 m. N/S by 15 m. E/W, while the scatter to the southwest exhibited a 25 m. diameter. The lithic assemblages are described below.

Provenience 1 (Northeast Lithic Concentration)

The majority of lithic materials recovered from the site were from this area. With the exception of 18 flakes, all lithic materials were found here. Although there is slight variation in material type composition between the two proveniences, overall assemblage content is similar.

Lithic debris recovered from this area suggests limited primary and secondary reduction. When dorsal cortex is examined on intermediate granitic rock and San Juan fossiliferous chert, both appear to indicate that some decortication occurred at the location. Although the San Juan cherts exhibit less dorsal cortex (less than 25%), the percentages of cortical platforms, which suggest primary reduction, are high. Intermediate granitics on the other hand exhibit dorsal cortex percentages more typical of primary decortication. The remaining material types represented in this assemblage, although low in numbers, also exhibit cortex. Again, the large number of cortical platforms among these remaining materials indicate that decortication occurred at the site.

Little evidence of formal tool manufacture was identified in this area. An examination of retouched platforms suggests that a formal tool of intermediate granitic rock may have been manufactured at the site. This retouched platform did not exhibit evidence of utilization that would indicate resharpening.

Additional artifacts that were recovered from this area include three cores, one from San Juan fossiliferous chert, one from quartzite, and the third from hornfels. Both the chert and quartzite cores were exhausted single platform cores. The fact that these cores were exhausted may indicate limited material availability. The hornfels core exhibited multiple platforms.

Other tools that were recovered from the site indicate that a variety of functions were carried out at the site. A denticulate fragment manufactured from hornfels may have been used to seperate plant fibers. Two expedient flake tools exhibit unidirectional scars and rounding, which typically result from scraping. One bifacial tool was also recovered from an unknown provenience on the site. It was manufactured from Rio Grande chert, was sucessfully heat treated, and appeared to have been utilized and discarded at the site.

Although no groundstone implements were recovered from the site, two flakes with grinding on their dorsal surfaces suggest that grinding implements may have been used here.

Provenience 2 (Southwestern Lithic Scatter)

Eighteen flakes were recovered from Provenience 2. This assemblage is similar to debitage recovered from Provenience 1 in material types, percentage of dorsal cortex, and platform types, but lacks evidence that tools were used at the location. The only flakes that were manufactured from a different raw material were two Brushy Basin chert flakes. These flakes also exhibited cortical platforms.

Summary

The lithic assemblage that was recovered from FA 5-3 exhibits evidence for primary and secondary reduction of a variety of raw materials. There is limited evidence for formal tool manufacture. The formal tools and expedient flake tools that were recovered from the site indicate that a bifacial tool may have been used and discarded at the local, that flake tools were used in scraping, and that a denticulate may have been used to process vegetal materials. The relatively low counts among a wide variety of raw materials may suggest repeated reuse of the area. The lack of formal hearth features would indicate a limited-use site.

FA 6-1

FA 6-1 consists of a sparse scatter of lithics and a few ceramics. No features were identified. Dates for the site are based on the ceramic analysis. One sherd from Provenience 1, and two from Provenience 2, date ca. A.D. 1150-1300+. Additional ceramics from Provenience 2 (six sherds from the same vessel) date ca. A.D. 900-1200 (Raish, this volume).

A total of 261 lithic artifacts was recovered from the site. These artifacts include 213 flakes, 1 piece of small angular debris, 3 bifaces, 1 uniface, 33 cores, 1 chopper, 1 axe (outside a defined provenience), 2 retouched rocks, and 1 anvil. Five additional artifacts were collected as core types but were eliminated in the specialized study. The majority of these artifacts were manufactured of intermediate granitic rock (73%) and quartzite (10%). The remaining 43 artifacts were manufactured of ten different material types. All of these artifacts, with the exception of two items, were manufactured of locally-available materials. Only the other igneous material types used to manufacture the axe and one core appear to be non-local, with sources in the No Agua and San Antonio Mountains west of Quemado, and in the Cochiti area.

Scatter diagrams were generated to examine the spatial distribution of artifacts across the surface of the site. These diagrams indicate that surface artifacts occur in three spatially distinct areas. One cluster of artifacts is located in the northeastern portion of the site and was defined as a separate provenience (Provenience 1). Another cluster of artifacts is located in the central portion of the site. This was divided into two proveniences: Provenience 2, the eastern portion of the cluster, and Provenience 3, the western portion. One subsurface artifact was recovered from a shovel test in Provenience 2, located in the eastern portion of the central cluster of artifacts (Provenience 5). The lithic artifacts will be described for these three surface areas and by provenience.

Provenience 1 (Northeastern Artifact Scatter)

This scatter of artifacts is located in the extreme northeastern portion of the site, and includes all artifacts collected as Provenience 1. No subsurface artifacts were recovered from this provenience.

A total of 71 lithic artifacts was recovered from the northeastern artifact scatter (Provenience 1). These include 59 flakes, 2 bifaces (one exhibiting morphology typical of net sinkers), 9 cores, and 1 retouched rock. The majority of these artifacts were manufactured of local intermediate granitic rock (61%) and quartzite (20%). The remaining 12 items were manufactured of seven different material types. With the exception of one core manufactured of other igneous material, all of the materials probably occur locally.

Examination of dorsal cortex on flakes and of platform types suggests that both primary and secondary reduction may have occurred in this area. All materials represented as flakes except for splintered silicified wood and melaphyre exhibit dorsal cortex. Cortex is present on the majority of the flakes (68% with some cortex, 32% without). Most materials exhibit both high and low percentages of dorsal cortex, suggesting that both decortication and some secondary flake production occurred. The high relative frequency of cortical platforms (54%) also suggests that decortication of these local materials occurred. With the exception of the Morrison light chert and the melaphyre platforms, all of the materials represented exhibit greater numbers of platforms with cortex than without. These data strongly indicate that locally-available materials were being manufactured into cores through decortication, potentially for transport off the site.

Core data support this suggestion. Of the nine cores identified all exhibit cortex, and only one other igneous multiplatform core is of a non-local material type (indicating transport to the site from another location). The remaining cores (three multiplatform, four single platform, and one tested) are all manufactured of local materials. Tested cores are expected at material acquisition locations, and the presence of one tested core manufactured of Fossiliferous San Juan chert suggests that this material was procured at this location. The two quartzite single-platform cores and the three intermediate granitic rock cores (one multiplatform and two single platform) could also have been manufactured at this location. Only one core of fossiliferous San Juan chert (exhausted multiplatform core) was reduced fully. The presence of this exhausted core suggests that flake production for tool manufacture may also have been an activity which occurred at this location. However, the evidence of decortication in conjunction with the presence of these cores suggests that these cores were potentially manufactured and discarded at this location, presumably as part of quarrying.

Evidence of tool manufacture and use is limited in this provenience. No retouched or prepared platforms indicative of formal tool manufacture were identified. In addition, tools themselves are limited. Two bifaces were initially identified within this provenience. One of these was later identified as exhibiting extensive marginal bidirectional retouch rather than facial retouch. Although both of these are manufactured of locally-available intermediate granitic material, no direct evidence for their manufacture at this provenience (or this site) is present in the recovered debitage. Both of these tools did exhibit utilized edges with bidirectional wear, indicative of cutting, but it is unclear if these tools were used at this location or simply discarded here. No expedient flake tools were identified.

Central Artifact Scatter

Unfortunately, the central artifact scatter consists of two previously-defined proveniences (2 and 3), which arbitrarily divide the scatter down the middle. In addition, five items from Provenience 3 are spatially distinct and comprise a western artifact concentration. The artifacts recovered from the shovel test in this area are described as Provenience 5.

Provenience 2 • This provenience includes surface artifacts occurring in the eastern half of the central artifact scatter. A total of 95 lithic artifacts was recovered from this provenience. These include 75 flakes, 1 biface (net sinker), 1 uniface, 16 cores (one battered), 1 retouched rock, and 1 anvil. The majority of these were manufactured of intermediate granitic rock (75%) and quartzite (11%). The remaining 13 artifacts represent4 different material types, all of which may occur locally.

Evidence for both primary and secondary reduction is present in this provenience. Dorsal cortex on flakes indicates that all the material types represented as flakes have moderate to high percentages of dorsal cortex, indicating decortication. Only intermediate granitic rocks and quartzite have some flakes which lack dorsal cortex. This suggest that decortication of all material types may have occurred at this provenience, and that secondary reduction may have occurred for both quartzite and intermediate granitic rock. Platform data support this suggestion, with half of all platforms (50%) exhibiting cortex, and nearly half (43%) exhibiting single facets.

There is a high relative frequency of cores (17% of all Provenience 2 artifacts). All of the cores discarded at this location were manufactured of local material. Of the 16 cores, 15 (93%) were manufactured of intermediate granitic rock and 1 was manufactured of quartzite. The intermediate granitic rock cores include eight multiplatform cores, four single-platform cores, and three tested cores. Tested cores typically indicate lithic material procurement, since they are produced by raw material evaluation. The quartzite core is a multiplatform type. These data, along with the presence of cortex on flakes and platforms, indicate lithic material acqusition, along with decortication of local materials and some limited secondary reduction.

Evidence for tertiary stages of reduction and formal tool manufacture is limited. Examination of flake platforms identified only one retouched platform, on a quartzite flake. This suggests that one quartzite retouched tool may have been manufactured at this location, however, no retouched tools of this material were recovered from the site. This suggests that a formal tool may have been manufactured in this provenience but was transported away from the site.

Formal tools recovered from this provenience include only one uniface (High Surface gravel quartzitic sandstone), suspected to be a manufacturing failure, and a biface (intermediate granitic rock), which exhibits morphology similar to a net sinker. Neither tool exhibited use-wear and it is unclear if either tool was used at this location, or simply discarded as a reject or because of tool replacement. No expedient flake tools were identified.

Provenience 3 • Provenience 3 consists of surface artifacts from the western half of the central artifact scatter. Also included are five artifacts that are spatially distinct and which comprise the westernmost small scatter of artifacts.

A total of 83 lithic artifacts was recovered from Provenience 3. These include 73 flakes, 1 piece of small angular debris, 8 cores (one battered), and 1 chopper. The majority of these were manufactured of intermediate granitic rock (82%), fossiliferous San Juan chert (6%), and Morrison light chert (6%). The remaining 5 artifacts were manufactured of 4 different material types, all which also occur locally.

Like the other proveniences previously discussed, Provenience 3 exhibits strong evidence of primary reduction with some limited evidence of secondary reduction. Examination of dorsal cortex on flakes indicates that only 20% of all flakes lacked any cortex, and all materials represented by more than a few flakes exhibit both high and low percentages of cortex on flakes. This suggests that primary reduction (decortication) and some secondary reduction occurred at this location. Platform data support this suggestion, with 61% of all platforms exhibiting cortex.

Evidence for tertiary manufacture is lacking in the debitage. No prepared platforms or retouched platforms indicative of formal tool manufacture were identified in this provenience. Formal tools themselves are limited to the one notched chopper manufactured of locally-available intermediate granitic rock. This artifact appears to have been broken at its notches, suggesting that it may have been broken while in use in Provenience 3. No expedient flake tools were identified.

Provenience 5 • Provenience 5 includes the subsurface artifacts recovered from shovel tests. There are two flakes manufactured of High Surface gravel quartzitic sandstone. One of these exhibits no dorsal cortex while the other exhibits less than 25% cortex on its dorsal surface. One flake exhibits a cortical platform while the other exhibits a single facet platform. Both of these flakes are within the range of items found on the surface. No other lithic artifacts were recovered from below the surface.

Summary

FA 6-1 appears to have resulted from the acqusition of raw materials occurring as cobbles at this site. Examination of debitage from all proveniences indicates an emphasis on decortication of locally-available materials. Proveniences 1, 2, and 3 are all characterized by evidence of primary and secondary reduction, which is typical of raw material acqusition areas. Evidence for tool manufacture and use is very limited. Only one flake exhibited a retouched platform, suggesting that a retouched tool was manufactured at this location. Although five formal tools were recovered, it is unclear if these tools were manufactured, used, or discarded as a result of replacement at the site. The discard of two bidirectionally-utilized formal tools in Provenience 1 could indicate that cutting occurred at this site, while the presence of a broken chopper in Provenience 3 tends to suggest that some chopping may have occurred. The other tools lacked evidence of use, or breakage through use. The uniface recovered from Provenience 2, however, may have been a manufacturing failure. The presence of a net sinker suggests that fishing may have occurred nearby. It may be an item that was discarded at this location as a result of replacement at a source of new material. An axe fragment outside of the defined proveniences, as well as several ceramics, suggest that this location may have provided other opportunities to prehistoric populations beyond simply lithic raw material procurement. In any case, it appears that the primary use of this location was for lithic material procurement.

FA 6-2

FA 6-2 is a sparse lithic scatter. No ceramics or features were identified. The site is defined as lithic unknown.

Eleven artifacts were recovered from the site. These included ten flakes and a maul. The majority of artifacts were manufactured from Morrison light chert (five artifacts) and San Juan fossiliferous chert (two artifacts). The remaining artifacts were manufactured from four locally-available materials.

These artifacts were sparsely scattered over an area measuring 44 m. N/S by 25 m. E/W. Due to the low counts and lack of evidence for discrete activity areas the entire assemblage is reported as a single provenience.

Low lithic counts within each material category limit interpretations of reduction. Four flakes exhibited retouched platforms, providing evidence of tool manufacture or resharpening. An examination of three retouched platforms on Morrison chert identified use-wear, indicating that resharpening occurred at the location. This evidence suggests that tools were utilized at the site.

A large maul was also recovered. It was grooved and measured 173 mm. by 69 mm. by 50 mm.

Summary

The extremely low artifact count at this site limits interpretation. The lack of intermediate granitic materials is clearly different from other sites in the study area. Platform data indicate that formal tools were probably used at the site.

FA 6-5

FA 6-5 consists of a rock shelter and a sparse scatter of lithic material. Although a recent hearth was identified at the site there were no prehistoric features recorded.

A total of 38 lithic artifacts was recovered from the site. These artifacts included 27 flakes, 7 cores, 2 choppers, 1 piece of groundstone, and an unmodified cobble. The raw material types that are represented on the site are consistent with most sites in the study area; the majority of lithic artifacts (63%, 24 artifacts) were manufactured from intermediate granitic rock. Quartzite made up 18% of the assemblage (7 artifacts). The remaining seven artifacts were manufactured from six different material types that all may occur locally.

Scatter diagrams were used to identify activity locations and define analytical assemblages. These artifact plots identified two overlapping surface proveniences, one near the mouth of the rock shelter (Provenience 1) and the other to the southwest (Provenience 2). Two additional flakes were recovered from shovel test pits in front of the rock shelter (Provenience 3). Lithic artifacts will be described for the two surface scatters and associated subsurface tests.

Northeast Lithic Scatter

The northeast lithic scatter occurred in front of the rock shelter. Artifacts are reported as Surface (Provenience 1), and Subsurface (Provenience 3).

Provenience 1 • The surface lithic scatter that was recovered in front of the rock shelter consisted of 25 artifacts. These artifacts included 15 flakes, 6 cores, 2 choppers, a piece of groundstone, and an unmodified cobble. Again, the majority of these artifacts were manufactured from intermediate granitic rock. This material occurred in both surface proveniences on the site. Quartzite also occurred in both surface proveniences with three of seven artifacts in Provenience 1. Three remaining artifacts were manufactured from melaphyre and other metamorphics, which occur only in Provenience 1.

Primary and secondary reduction is indicated by dorsal cortex and platform data on lithics, but there is no evidence that formal tools were manufactured at the site. Although 38% of intermediate granitic flakes lacked dorsal cortex (5 artifacts), dorsal cortex on the remaining 8 flakes ranged from 1-99%. Quartzite also exhibited dorsal cortex, which indicates that primary decortication occurred at the site.

The large percentage of cortex on cores, and the number of tested cores, suggest that raw materials were tested for quality. The gravels above the site provide a good source of lithic materials. Tested cores were of melaphyre, quartzite, and intermediate granitic rock. The remaining cores were all of intermediate granitic rock and consisted of two multiplatform cores, a single-platform core, and one exhausted multiplatform core.

The lack of flakes with retouched platforms, and the absence of formal tools that are manufacturing failures, indicate that this is not a formal-tool manufacturing location. Expedient flake tools are lacking as well.

A single piece of groundstone was recovered from Provenience 1. It is a fragment of undetermined groundstone. It is unclear whether this artifact was used in vegetal processing.

Provenience 3 • Two lithic flakes were recovered from subsurface shovel tests in front of the rock shelter. The flakes were manufactured from quartzite.

Southwestern Lithic Scatter

Provenience 2 • Eleven lithic artifacts were recovered from Provenience 2: ten flakes and one core. Although the majority of these artifacts were manufactured from intermediate granitic rock (five artifacts) and quartzite (two artifacts), which is consistent with Provenience 1, four flakes were manufactured from material types otherwise not found on the site. The material types represented by these flakes include splintered silicified wood, brushy basin chert, banded chalcedony, and High Surface chert. Of these, only the High Surface chert flake exhibited cortex. Although limited, these data suggest that materials other than those already discussed were reduced at the location.

A single platform core was also recovered from this area. It was manufactured from intermediate granitic material, and cortex occurred on more than 50% of the artifact.

Summary

The lithic materials that were recovered from FA 6-5 indicate that the location was probably used to select raw materials from the gravels above the site. Although few lithic artifacts were recovered from the site, the high percentage of cortex on flakes and cores, and the number of tested cores, suggest that raw materials were examined for quality. A single piece of groundstone indicates that grinding occurred at the location, but it is unclear if these activities relate to vegetal processing.

Isolated Artifacts

Isolated artifacts (termed isolated occurrences or isolated finds) have recently been shown potentially to represent aspects of prehistoric land use often ignored by the traditional focus upon site assemblages. Binford (1988, 1990) has shown that at least in two regions in New Mexico (representing both dynamic and very stable environments), assemblages of isolated artifacts appear to represent the discards resulting from limited activities. These discards are then classified as isolates because they are unaccompanied by other remains.

These kinds of assemblages are generally different from site assemblages in several ways. Isolate assemblages are characterized by high relative frequencies of tools, and by use-wear suggesting that they result from tool attrition due to tool use. Formal tool manufacturing debris, however, is generally underrepresented compared to sites, since most formal tool manufacturing may produce concentrations of debris, which would be classified as sites. Tool-maintenance, however, such as resharpening of tools, will result in isolates, since maintenance can be expected to occur as a tool is used. Larger items which are generally not expected to be carried as part of personal gear should be underrepresented when compared to sites. These items, including groundstone, are expected only on sites.

In this section, the Farmington-area isolated occurrences are examined with these points in mind. Although no direct comparisons are made of isolates to particular sites, general trends within both types of assemblage are examined as the data are summarized.

A total of 116 isolated finds was recorded in the Farmington region. These include 78 flakes (67%) (4 of which are unmodified flake tools), 18 cores (16%), and various tools (20, 17%). These tools include four axes (three percent), seven grooved mauls (six percent), one denticulate (one percent), two projectile points (two percent), two bifaces (two percent), two retouched flakes (two percent), one core/chopper (one percent), and one retouched rock (one percent). When the 4 expedient utilized flakes are added to these tool counts the relative frequency of tools is increased to 21%.

Like the site assemblages, the isolated find assemblage is characterized by local raw material types. Only two artifacts were manufactured of non-local materials. These are one axe made of an other igneous material, and one unmodified flake made of polvadera obsidian. Local materials are by far better represented, with intermediate granitic rock representing 37% of the assemblage (42 items), and San Juan fossiliferous chert representing 23% of the assemblage (26 items). The remaining local material items are split among 14 local material types.

Reduction stages that are represented in the isolate assemblage include decortication of core material and material selection (primary reduction), as well as flake production (secondary reduction). Evidence for decortication and material selection includes high relative frequencies of cortical flakes (57%), and the presence of numerous cores (16% of the assemblage), all manufactured of local materials. Secondary reduction is evidenced by the presence of non-cortical flakes (43%).

Evidence for tool use, maintenance, and discard is also present, and well represented in the isolated find assemblage. The high relative frequency of tools (21%) suggests that these isolated find locations are limited use-locations, presumably representing a range of activities which occurred off-site.

Many of these specialized tool types (grooved mauls and axes in particular) are generally associated with limited activity sites (see conclusions), and the isolate data follow this trend. Axes represent three percent of the isolate assemblage, and grooved mauls six percent. These relative frequencies are quite high compared to the majority of the sites. This suggests that isolates not only represent limited-use locations, but that these locations may have been somewhat specialized in function within the Farmington region. Unfortunately the possible functions of grooved mauls and axes have not been fully examined in the literature, and it is unclear if these are related to farming or the processing of some natural resource.

Additional tool use is evidenced by the presence of use-wear on four unmodified flakes and on two retouched flakes. The occurrence of these expedient tool types as isolates also supports the notion that these are actually limited-use loci. Expedient flake tools are expected to be discarded at their location of use except when raw material shortages affect discard patterns. In the Farmington region, raw material is readily available and shortages are not expected.

All of the wear on these expedient tools is unidirectional, indicating scraping. This suggests that expedient tools used for scraping may have been employed more frequently off-site than on-site within the region. The wear patterns are typical of scraping on hard media like bone or wood (Schutt 1980).

Tool maintenance is also represented in the isolated find assemblage. Three platforms (three percent of the isolate assemblage) exhibited retouched and utilized platform dorsal edges. Utilization on retouched platforms suggests that retouched tools were resharpened by retouching at the isolated find location.

In summary, this isolated artifact assemblage exhibits a very high percentage of tools compared to frequencies generally exhibited by sites. These tools appear to represent discards associated with particular kinds of activities which occur outside of residences or camps. In some cases they may be considered part of a continuum of discards associated with specialized, limited-use locations ranging from a single item to a small, limited-activity site.

The locations of more specilized tools such as axes and grooved mauls support these findings. These are more frequent among the isolates and on small, limited-activity sites. This suggests that the activities associated with each type of location (isolated find versus small, limited-use site), or its function, could be essentially the same. The differences in variety and frequency between the isolate and the small, limited-activity site may result from variable discard rates and from differences in length of occupation, or from group size, rather than from differences in the primary activities conducted at each kind of location. Unfortunately it is unclear exactly what these activities may have been, but clearly they involved the use of chopping tools and large pounding implements.

Additional activities represented in the isolate assemblage may include hunting, as represented by the two projectile points, and scraping, as represented by the six expedient tools.

It is important to point out that no groundstone was recovered as isolates. It appears that vegetal processing occurred only on sites within the study area. This is consistent with the expectation that larger items will not occur as isolates.

Also represented are limited-use locations which appear to reflect raw material evaluation, and decortication of local raw materials. The presence of flakes exhibiting dorsal cortex, and cores, indicates that simple core reduction and preparation occurred at some of these locations. Presumably these items indicate lithic raw material procurement.

Conclusions

The archeological sites examined in the Farmington portion of the Elena Gallegos Land Exchange exhibit considerable lithic assemblage variation. The lithic assemblages indicate a wide variety of activities, reflecting varying land-use strategies. These range from limited-activity locations to longer-term occupations. Although detailed discussions of site assemblage content are presented in the individual lithic reports, a more general comparative summary will serve to illuminate the range of activity diversity identified.

The lithic data that have been presented in this chapter were intended to address a variety of questions regarding subsistence. These questions relate to the technological and functional components of prehistoric subsistence adaptations. The lithic assemblages provide information about the technology that was used prehistorically in response to subsistence problems. This realm of information can be divided into three general information categories: material selection, reduction and tool manufacture, and tool function.

The following section will discuss three tables that summarize data pertaining to these kinds of information. Tables 8-2 and 8-4 present site-by-site summaries of dominant material types, reduction and tool manufacture, and tool function. These data have been pulled from individual lithic site reports, and in some cases reclassified to summarize the data more easly.

Table 8-2 lists the total lithic artifact counts, and provides information on the two dominant raw materials represented on each site. It also lists the reduction stages that are represented. Reduction stage is characterized by upper- and lowercase figures to illustrate the emphasis in each assemblage (uppercase figuresw indicating greater emphasis). Decortication is viewed as representing primary reduction, secondary reduction is debitage lacking cortex, and tertiary reduction represents formal tool manufacture. An assemblage type designation was assigned on the basis of reduction characteristics to summarize assemblage variety more easily.

Table 8-3 lists the reduction Type classifications identified in the Farmington study area and the number of sites that exhibited each type of overall assemblage. Type I assemblages exhibit equal evidence for primary, secondary, and tertiary reduction, indicating that decortication, core reduction, and formal tool manufacture occurred at the site. These sites may represent longer-term occupations or repeated occupations through time. Type II assemblages exhibit little or no evidence of primary reduction, indicating that prepared cores were probably brought to the site to manufacture expedient and/or formal tools. Debitage at these locations clearly represents formal tool manufacturing. These sites may represent special-activity locations or seasonal resi-

Table 8-2. Site-to-Site Comparisons of Reduction and Tool Manufacture.[1]

Site Number	Artifact Count	Material 1	Material 2	Reduction Stage[3]			Type[2]
1-1	53	Intermediate Granitic	Quartzite	PRIMARY	SECONDARY	TERTIARY	I
1-2	128	Intermediate Granitic	Sandstone	Primary	SECONDARY		V
1-5	33	Intermediate Granitic	Quartzite	PRIMARY	SECONDARY		IV
1-6	682	Intermediate Granitic	San Juan Fossiliferous	PRIMARY	SECONDARY	TERTIARY	I
1-9	43	Morrison Gray	Quartzitic Sandstone	SECONDARY		TERTIARY	II
1-10	24	Morrison Gray	Quartzite	Primary	Secondary		IV

Table 8-2. Site-to-Site Comparisons of Reduction and Tool Manufacture.[1] (continued)

Site Number	Artifact Count	Material 1	Material 2	Reduction Stage[3]			Type[2]
2-6	44	Intermediate Granitic	Morrison Gray	PRIMARY			III
2-7	126	Intermediate Granitic	Melaphyre	PRIMARY	SECONDARY	Tertiary	IV
2-8	140	Intermediate Granitic	Yellow Wood	Primary	SECONDARY	TERTIARY	II
2-9	95	Intermediate Granitic	Brushy Basin	PRIMARY	SECONDARY	Tertiary	IV
2-10	79	Intermediate Granitic	San Juan Fossiliferous	PRIMARY	SECONDARY	Tertiary	IV
2-11	75	Intermediate Granitic	San Juan Fossiliferous	PRIMARY	SECONDARY	TERTIARY	I
2-12	17	San Juan Fossiliferous	Intermediate Granitic	PRIMARY		Tertiary	III
2-15	101	Conchoidal Wood	High Surface Gravel	Primary	SECONDARY	TERTIARY	II
2-16	44	Intermediate Granitic	Melaphyre	PRIMARY	Secondary	Tertiary	VII
2-17	644	High Surface	Conchoidal	Primary	SECONDARY	TERTIARY	II
2-18	118	Conchoidal Wood	High Surface Gravel	PRIMARY	SECONDARY	TERTIARY	I
2-19	11	Intermediate Granitic	Melaphyre	PRIMARY			III
3-3	261	Intermediate Granitic	Quartzite	PRIMARY	SECONDARY	TERTIARY	I
3-6	261	Intermediate Granitic	Conchoidal Wood	Primary	SECONDARY	TERTIARY	II
5-1	109	Intermediate Granitic	Yellow Wood	Primary	SECONDARY	TERTIARY	II
5-2	3798	High Surface Gravel	Conchoidal Wood	Primary	SECONDARY	Tertiary	V
5-3	84	Intermediate Granitic	San Juan Fossiliferous	PRIMARY	SECONDARY	Tertiary	IV
6-1	261	Intermediate Granitic	Quartzite	PRIMARY	SECONDARY	Tertiary	IV
6-2	11	Morrison Light	San Juan Fossiliferous			Tertiary	VI
6-5	38	Intermediate Granitic	Quartzite	PRIMARY			III

[1] See text for explanations of categories.

[2] See Table 8-3.

[3] All caps entries in the "Reduction Stage" category indicate greater emphasis on a reduction stage, and lower-case entries conversely.

dences. Type VI assemblages are similar, but debitage indicates that limited manufacturing occurred. Type III assemblages are limited to primary decortication. These sites probably represent material acquisition locations where raw materials were transformed into prepared cores for transport to other locations. Type VII sites are also dominated by decortication debitage, although some secondary and tertiary debitage is also present, suggesting limited tool manufacture.

Type IV assemblages were most common, and are characterized by an equal emphasis on primary and secondary reduction, but a lack of evidence for formal tool manufacture. The Type V assemblage is characterized by secondary debris. Although limited evidence for primary and secondary reduction may occur, these assemblages are clearly secondary. The high percentage of secondary, non-cortical debris may represent expedient flake tool production, or the manufacture of flakes to be taken to another location for further manufacture into formal tools.

Table 8-4 summarizes basic functional diversity on sites in the study area. This table lists sites that exhibit evidence of expedient tool-use, formal tool-use and resharpening, vegetal processing, and other activities that may be represented by artifacts recovered from the sites. Again, upper and lower case figures are used to illustrate emphasis on varying functions.

The following section will briefly summarize variation in material selection, reduction and tool manufacture, and tool function. The individual lithic reports provide a more detailed discussion of lithic variation on a site by site basis.

Material Selection

Limited evidence of exotic materials was recovered from sites in the study area. This may partially be the result of the abundant high quality raw materials that are locally available. The only exotic materials that were identified were Jemez obsidian, which includes Polvadera Peak obsidian, and vitrophyre basalt. Only small amounts of these materials were recovered.

The Farmington sites were characterized by a variety of high quality raw materials that occur locally. Intermediate granitic rock was consistently the major material represented on sites in the study area. Seventeen sites had assemblages dominated by this material type (Table 8-2). Generally, quartzite (five sites), and San Juan fossiliferous chert (four sites), co-occur with intermediate granitics as the favored raw material. Melaphyre (three sites), yellow silicified wood (two sites), Morrison light chert (one site), sandstone (one site), and Brushy Basin chert (one site) also occur.

Table 8-3. Reduction Type Classification.

Type I (5 sites)	PRIMARY, SECONDARY, TERTIARY; decortication, core reduction, formal tool manufacture.
Type II (6 sites)	SECONDARY and TERTIARY; prepared core reduction and formal tool manufacture.
Type III (4 sites)	PRIMARY ONLY; decortication.
Type IV (7 sites)	PRIMARY and SECONDARY; decortication and core reduction.
Type V (2 sites)	Primary, SECONDARY, Tertiary; Primary, SECONDARY; core reduction for flake production.
Type VI (1 site)	Tertiary; limited formal tool manufacture.
Type VII (1 site)	Primary, Secondary, Tertiary; emphasis on decortication, with limited formal tool manufacture.

High Surface gravels and conchoidal silicified wood was the second most common raw material combination found on sites. Five sites exhibited this combination, and generally reduction on these sites indicates formal tool manufacture (Type II) or secondary flake production (Type V). The limited evidence of primary decortication among sites with High Surface gravel and conchoidal silicified wood may indicate that although locally available, these materials are located farther away than other local materials. All of the sites with assemblages dominated by High Surface gravel and conchoidal wood had limited evidence of primary decortication.

Morrison cherts were the dominant material type on only three sites. These sites exhibited a range of reduction and manufacturing assemblages.

Reduction

The majority of sites in the study area represent primary and secondary reduction locations (Type IV). Seven sites fit into this reduction classification, and were places of decortication and secondary flake manufacture. These sites lack evidence of formal tool manufacture. At these sites, flakes may have been manufactured for expedient

Table 8-4. Comparisons of Functional Variation.

Site Number	Expedient Tool Use	Formal Tool Use	Grinding	Other Activities
1-1	CUT/SCRAPE[1]	RESHARPENING	VEGETAL	—
1-2	—	—	VEGETAL	—
1-5	scraping	—	—	pecking
1-6	CUT/SCRAPE	RESHARPENING	VEGETAL	perforator
1-9	CUT/SCRAPE	RESHARPENING	—	—
1-10	cut/scrape	—	VEGETAL	—
2-6	—	—	—	chopper
2-7	cut	—	vegetal	axe, maul, anvil
2-8	CUT/SCRAPE	—	—	axe
2-9	cut/SCRAPE	—	VEGETAL	bone tool manufacturing
2-10	CUT/SCRAPE	—	vegetal	axe
2-11	—	—	—	graver
2-12	scrape	RESHARPENING	other	—
2-15	CUT/SCRAPE	RESHARPENING	VEGETAL	—
2-16	CUT/SCRAPE	—	—	chop, peck, roast
2-17	CUT/SCRAPE	RESHARPENING	vegetal	—
2-18	SCRAPE	resharpening	—	—
2-19	—	—	vegetal	axe
3-3	scrape	—	vegetal	—
3-6	CUT/SCRAPE	RESHARPENING	VEGETAL	drill
5-1	SCRAPE	—	VEGETAL	—
5-2	SCRAPE	BIFACE TOOL	—	heavy bipolar
5-3	SCRAPE	BIFACE TOOL	—	denticulate
6-1	cut	—	—	chopper, axe, anvil
6-2	—	RESHARPENING	—	maul
6-5	—	—	other	—

[1] Entries in all caps indicate greater emphasis on an activity, and lower-case entries conversely.

flake tools, or made to be later transformed into formal tools at another location. Among the Farmington sites, all sites that were classified Type IV exhibit evidence of expedient flake tool-use, so it would appear that these sites were used to reduce cores and produce flakes for expedient tool-use.

Six sites exhibited Type II assemblages, which are characterized by secondary and tertiary debitage. These assemblages, for the most part, lack evidence of primary reduction and provide evidence of formal tool manufacture. The limited cortical debris suggests that prepared cores were brought to these locations to manufacture tools. It would appear from the information presented in Table 8-4 that both expedient and formal tools were manufactured. All Type II sites contained expedient flake tools, which were used in both cutting and scraping. These sites also show an emphasis on vegetal processing.

Five sites exhibited equal emphasis on all stages of reduction (Type I). These types of assemblages are expected to occur at locations of longer occupations, or at sites that are reoccupied through time. This type of reduction assemblage in association with a wide variety of raw materials would suggest repeated occupations, while limited material type diversity might indicate a more specialized manufacturing location.

Four sites were characterized predominantly by primary reduction assemblages (Type III). These are locations where primary decortication occurred, and sites of this type are viewed as representing material acquisition locations where raw materials were prepared for transport to more permanent sites. One would expect limited functional diversity at material acquisition locations. With the exception of FA 2-12, these Type III sites exhibit limited functional diversity, suggesting that they were special-use locations.

Two sites exhibited assemblages that were clearly secondary (Type V). These assemblages may exhibit limited evidence for primary decortication or formal tool manufacture, but debitage is predominantly without cortex. Again, this assemblage may reflect either expedient tool manufacture or the manufacture of flakes to be transported away from the site and later manufactured into formal tools. While FA 5-2 exhibits evidence of expedient flake tool-use, FA 1-2 does not. FA 1-2 probably represents a location for the production of flakes to be transported away from the site for later use or manufacture, while FA 5-2 appears to represent a location where expedient flake tools were used for scraping.

Function

Substantial functional diversity is represented on sites in the study area. The groundstone data support Raish's conclusions (this volume) that a number of locations were being used for gathering and processing vegetal materials. Eight sites exhibited an emphasis on vegetal processing, while five sites have limited evidence for this activity. Ten sites, however, lacked evidence of grinding.

The sites that lacked evidence of grinding contained artifacts that indicate a range of other activities. Expedient tool-use is typically indicated, while a variety of less common tools like mauls, choppers, axes, gravers, anvils, and denticulates suggest more specialized activities.

Expedient flake tools generally represent a combination of activities; however, seven sites have tools exhibiting only unidirectional wear, indicating activity restricted to scraping. The wear patterns on these tools typically result from scraping on a hard medium like bone or wood (Schutt 1980).

The lithic assemblages that have been recovered from sites in the Farmington portion of the Elena Gallegos Land Exchange have helped to identify a variety of activity locations. These locations range from more specialized, limited-activity sites to locations of repeated seasonal reoccupation. The lithic data presented in this chapter, in conjunction with a variety of information gained from other specialized analyses, provide a clear picture of prehistoric subsistence in the area.

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Chapter 9 • Faunal Remains From FA 1-1, 1-5, 2-8, 2-16, 2-17, 6-5, and 8-1

Jack B. Bertram

Methods

All vertebrate skeletal remains were diagnosed to the limit of reliability using the comparative collections of the Museum of Southwestern Biology (MSB), University of New Mexico. Invertebrate remains were compared to the shell collection at the Chaco Center, National Park Service. All observations are detailed in Appendix 9-1, organized by site number, field specimen number, and standard taxonomic sequence.

Although all pieces were compared directly to known materials, the reliability of identification was variable, depending on the character of each specimen. In Appendix 9-1, definite identifications are shown without comment. Highly probable identifications are shown with ref (referred to) prefixed to the less-than-certain term. Likely identifications are given at the next-most-specific taxonomic level. Very uncertain identifications, based almost entirely on size, are prefixed by so (size of).

Unidentified rodents were specified as small (no larger then Ord's K-rat), medium (no larger than prairie dog), and large. Where the piece was clearly mammalian, but no information other than fragment thickness and shape could be determined, only a size range was specified. Small mammals include those of, or less than, cottontail size; inevitably, some jackrabbit or small carnivore fragments may be included. Medium mammals are those of jackrabbit-size or larger, but smaller than a small mature sheep. (Again, occasional fragments of larger forms will appear in this category.) Large mammals are those of body weight greater than 40 kg. These tend overwhelmingly to be artiodactyls.

Where more than one specimen from a single provenience met a single description, this fact was indicated (Appendix 9-1, "No."). Where pieces appeared to represent a single specimen broken in excavation an asterisk (*) follows the count.

Where possible, all materials were classified according to their skeletal element and portion of element recovered. Laterality was noted where determined. Element and portion terms are summarized in Appendix 9-1; laterality was shown as L (left), R (right), ? (uncertain), or - (irrelevant).

Age, size, sex, and fusion were specified where determined, using the MSB series; in general, the most exact designation was chosen. Thus, male also implies mature, large, and fused unless otherwise indicated. Where more than one fusion center was visible, the most anterior/proximal is listed first.[1]

Burning was characterized in detail according to the hardness, color, and completeness of the heat modification. Where burning was incomplete or mild, or where color and texture changes so indicated, roasting was reported.

Condition was described in detail for all specimens. Definite characteristics such as gnawing (by agent), scatological smoothing and rounding, the color and texture changes induced by ground-water leaching, and the very diagnostic effects of root-etching and surface-exposure weathering were noted. Where more specific textural or structural changes were observed, specimens were characterized as weathered, eroded, or friable. Human modification was noted as a condition state. Anomalies or striking observations were recorded as NOTES in Appendix 9-1.

Minimum number of individuals (MNI) was estimated according to a standard approach (Grayson 1979; Chaplin 1971); computations were performed on materials sharing a field specimen number (Table 9-1). Where suggested by excavation documentation, MNI was estimated also for pooled FS#. Estimates in all cases were based on element/portion/laterality/age-sex compatibility, rather than on the less accurate "most-common element" method.

The minimum total taxa estimated for each analytical/excavation unit represents the minimum number of species required to produce the observed assemblage. Where a less specific taxon was reported but could represent materials from species reported more exactly, it was not counted. For example, "lagomorph" was counted only if neither Sylvilagus nor lepus was reported as definitely present.

Taxa Recovered

Faunal remains from seven sites in the Farmington area were studied for this report. Materials identified included:

Sciuridae: Cynomys sp.	Prairie dog
Heteromyidae: Dipodomys ordii	Ord's Kangaroo Rat
Cricetidae: Neotoma sp.	Woodrat
Erethizontidae: Erethizon dorsatum	Porcupine
Leporidae: Lepus ref. californicus	Blacktailed jackrabbit
Sylvilagus sp.	Cottontail
Cervidae: Odocoileus ref. bemionus	Mule deer
Mollusca: Haliotus sp.	Abalone

Table 9-1. Farmington MNI.

Site No.	ES No.	Cynomys	L. Sciurid	D. Ordii	Neotoma	M. Rodeni	Erethizon	Lepus	Sylvilagus	Lagomorph	Odocoileus	O. Canadensis	Artiodactyl	Sm. Mammal	Lg. Mammal	Haliotis	Indeterm	Min. Total Taxa
FA1-1	48														1			1
	49							?							?		1	2
	50							?										1
	54								?									1
FA1-5	2										1							1
	3										1							1
FA2-8	80							1										1
	81				1													1
	83				?													1
	85													1			1	1
FA2-16	38															?		1
	45			1														1
	52								1		1				1			2
	53															?		1
	54											1	?					1
	56													1	1			2
	60				1													1
FA2-17	31														1			1
	34								?	1								1
	68													1				1
	69									?					1			2
	71									?								1
FA6-5	33								1									1
	34	1			1	1		1	1					1			1	4
	36	2	1		1		1	2	2/3	1	1		1	1			1	6
	38							1	1		1							3
FA-1	1										1							1

Cynomys: The local prairie dog was most probably gunnisoni (Bailey 1931; Findley et al., 1975), behaviorally similar to its plains congeners except for its tendency to frequent slightly more broken terrain and to aggregate into smaller groups. In the Farmington area, prairie dogs likely breed but once per year. Consequently, it is likely that specimens FA 6-5-34 and FA 6-5-36 represent deposits produced in part during the late summer or fall of the year.

D. ordii: Bailey (1931) noted that Ord's K-rats were rather easily taken by trapping. Their stores were viewed as emergency larders by Southwestern groups. Rats were taken incidentally while their caches were being raided. Certainly some Anasazi groups viewed them as edible (Bertram and Draper 1983). The one specimen recovered was consistent in condition with other materials from FA 2-16, although its friability may indicate its introduction as scat.

Neotoma: Noted from FA 2-8 and FA 6-5, and recovered as an adolescent mummy from FA 2-16, packrats of several species occur in the sites' area. Excepting the mummy, all materials referable to Neotoma were burned or roasted. Packrats are easy game and large enough to be worth taking although they rarely carry much fat. The burned bones are exclusively from the hindquarters, which bear the bulk of meat in this rodent.

Erethizon: Porcupines were taken historically for food over all their wide range, including all of the San Juan Basin (Bailey 1931). The present specimen, from an old individual, exhibits canid or human gnawing; it may have died a natural death.

Leporids: Both jackrabbit and cottontail occur over the entire San Juan Basin; their relative abundance is controlled primarily by topography. There can be little doubt that the two forms served as a major staple for every agricultural group in the Basin (Bertram and Draper 1983). It is not surprising that the leporids make up the bulk of identified material from the Farmington sites.

It is likely that the Sylvilagus specimens are all referable to audoboni (desert cottontail) and the larger materials to L. californicus (blacktail jackrabbit), although the specimens presented were insufficient to determine their affiliations exactly. For both forms, all durable portions of the body were about equally common (Table 9-2), suggesting on-site consumption in most cases. This author has found (Bertram n.d.) that scats and pellets tend to contain disproportionately high quantities of foot elements, while raptor discards tend to be composed of articulated limbs. These facts, together with the widespread roasting or burning observed, suggest human consumption. Human gnawing on leporid bone was noted from specimens FA 6-5-34 and FA 6-5-38.

The long multiple breeding seasons of both forms render neither very suitable for seasonal determination; how-

Table 9-2. Pooled Frequencies of Occurrence of Identified Parts for all Sites in this Study.

	Lepus	Sylvilagus	Odocoileus & Artiodactyl/ILM	Neotoma	D. Ordii	Cynomys & Lg. Sciurid	Erethizon
Innominate	2	2		2			
Femur	1			1		1	
Tibia		3	1	1		2	
Tarsals			1				
Metatarsals	1						
Scapula	1	1					
Humerus	3	1	3		1		
Ulna		1					
Radius			1				
Metacarpal	1						
Mandible		2				1	1
Skull	2	1					
Vertebrae	2		2				
Phalanges			2				
Ribs			2				

ever, fusional data suggest that both specimens FA 2-16-52 and FA 6-5-36 pertain at least partly to summer or autumn.

Odocoileus: Although whitetail deer may occasionally range into the San Juan Basin, mule deer are much more common there. Of some five animals from the Farmington sites thought to be deer, mature males (on size) occurred in FA 1-5, FA 6-5-38, and probably in FA 5-2-16-56. A mature doe is apparently represented in FA 6-5 and FA 2-16 had been roasted or burned; those from FA 1-5 and FA 8-1 were surface finds.

The FA 1-5 specimen exhibited steel ax cuts. If the three bucks were taken locally, a tentative inference of winter death may be appropriate, as male muleys tend to occupy rather rougher, higher terrain than do does, except during severe weather (Bailey 1931). With the exception of FA 2-16, deer in the Farmington assemblages are clearly represented by appendages only.

Ovis canadensis: The diagnosis of mountain sheep in FA 2-16-56 is problematical, primarily reflecting the difficulty of taxonomic discrimination of fragmentary specimens. Wild sheep are easily and rapidly extirpated or ousted (Bailey 1931); a definite archeological bighorn from this area would be useful evidence for an early date of occupation or else long-range trade.

Haliotus: Abalone shell, of Pacific provenience but possibly Sonoran, was widely traded prehistorically. It is relatively common in Anasazi sites (Mathien, personal communication).

Indeterminate forms: In no case do the indeterminate materials from the Farmington sites suggest the presence of animals other than those definitely or tentatively identified. Akins (this volume) reported substantially the same fauna from her study of FA 1-6, FA 3-3, and FA 3-6. Although she found no porcupine and only nonspecific large sciurids, she also identified some gopher and bobcat specimens. She was also unable to establish on-site processing of deer, but as she noted, her large mammal/ungulate materials were almost certainly from sheep, antelope, or deer.

This report differs from Akins' in a significant way, in that Akins suggests that evidence of surface exposure may be diagnostic of intrusive bone. This author disagrees; numerous observations suggest that archaeological bone will check, splinter, and bleach white if exposed by erosion. Consequently, surface-weathering is not viewed as evidence of intrusivity in this report.

The Sites

Seven sites were sampled in the present analysis. Of these, six are open sites and one (FA 6-5) is a rockshelter. The open sites will be discussed first, in numerical order.

FA 1-1 is interpreted as a roasting area, with associated lithic, ceramic, ash, and burned cobble scatters. Ten bone pieces were recovered. All were fragmentary and none could be certainly identified. However, both large and lagomorph-sized mammals are represented. All but two pieces were burned, most while fresh (Binford 1972). Leaching was severe; it is likely that bone preservation was insufficient to allow useful recovery of unburned bone.

FA 1-5 is reported as a hearth, sherd, and lithic scatter. Two samples were collected from the surface. Both appear to be from a single mule deer buck. They are remarkable only in their unusual gracility and large size. The tibia was severed at midshaft by two or more blows from a steel ax. Canid gnawing was evident on both pieces.

FA 2-8 is an eroded ceramic, lithic, and ash scatter. Fifteen specimens were recovered. Lepus and Neotoma were noted as was an indeterminate large mammal fragment. A Lepus metatarsal was identified in the field as a bead fragment. Rounding is present at one end of this piece, but that could be due to gastric action prior to burning. No unburned pieces were noted; most appeared to have been leached after burning. Preservation of unburned bone in this site was probably poor.

FA 2-16 is described as a burned cobble hearth and sherd and lithic scatter, near a small rockshelter. All specimens save FA 2-16-60 pertain to the hearth area; No. 60 was taken from the shelter fill. The hearth area yielded Ord's K-rat, cottontail, and deer, together with indeterminate fragments consistent with these three forms. Several shell fragments were also recovered. These appear to be abalone. A total of 141 pieces was studied from the open site. Of these, all save the shell and definite small forms exhibited roasting. A cottontail humerus may bear cutmarks. The K-rat humerus is anomalously fresh in appearance, although most materials showed root-etching. Overall preservation was apparently good. Artiodactyl/large mammal fragments dominated the assemblage; interestingly, these are mainly parts of high meat value but low drying utility. Humeri, vertebrae, and roasted long-bone splinters were noted.

This site is best interpreted as a short-term occupation site in which meat was processed for transport, consumption being limited to parts not worth transporting or difficult to process. Meat and marrow bones were probably roasted on a cobble grill (Bertram and Draper 1983).

A mummified woodrat (older immature) was found in the associated rockshelter fill (FA 2-16-60).

FA 2-17 is a discontinuous lithic scatter, having three concentrations. All samples are from a 4 m. wide charcoal stain located within one concentration. Fifteen pieces were studied; all are from lagomorph-sized or large mammal. All were burned and exhibited weathering and/or leaching.

FA 8-1 is a lithic scatter with burned cobbles. One bone was recognized; it is a surface-weathered medial ungle from a juvenile deer

FA 6-5, unlike the other sites in this study, was not exposed. Rather, it was a rockshelter having an associated hearth (thought to be recent), a lithic scatter, and woodrat occupation.

An impressive array of bone was recovered from four proveniences at FA 6-5, totaling 55 pieces. Prairie dog, woodrat, cottontail, jackrabbit, porcupine, and deer were definitely identified. A total of 2-3 prairie dogs (including large sciurids) are represented, including a young animal, a possible adolescent, and an adult. One woodrat was noted: the femur had been roasted. An aged porcupine mandible was recovered: it had been heavily eroded and gnawed by a canid. Three jackrabbits were present, two of them immature. Human gnawing was observed on a lumbar vertebra of one. Some jackrabbit parts were burned or roasted; others, nearby and equivalent in age, were fresh. Two or three cottontails were recorded. One ilium had been gnawed by a human prior to burning: other parts had been roasted. At least one cottontail was very young. Again, fresh and burned pieces were found to be associated and equivalently large.

Only two definite deer pieces were seen; these are from a buck and a doe. The doe ungle was roasted/burned, while the buck radius was roasted.

Gastric polish was observed on pieces pertaining to both large and small forms; either human or carnivore faeces could be indicated, as could be canid bone-licking.

Certainly FA 6-5 exhibits an archaeofauna consistent with and diagnostic of human occupation, with possible presence of carnivore-introduced pieces. Age evidence from sciurids and lagomorphs suggests the presence of a late summer or fall component, and the male deer suggests a cold-weather occupation.

Summary

Of the six open and one sheltered sites whose faunas were analyzed in this study, seasonal evidence suggests some occupational activity in late summer or fall for sites FA 2-16 and FA 6-5. These sites, as well as FA 1-5, may also include a winter occupation.

Behavioral reconstruction in this study was limited to the identification of site FA 2-16 as a short-term, intermediate processing site, with consumption of marrow and deer parts that store poorly; roasting was probably carried out on a cobble grill or oven. It was suggested that site FA 6-5 contains evidence of both human and carnivore occupation.

The only exotic item was abalone shell, from site FA 2-16.

Processing and breakage in these sites are not greatly different from that reported for FA 1-6, FA 3-3, and FA 3-6. (Akins, this volume). Although only FA 3-6 may be directly comparable to any of the sites currently considered, no great differences in technology or behavior are apparent across time or between the present study and that of Akins (this volume).

Note

1. The determination of age, size, and sex for mixed archaeofaunas involves rather complex logic. In summary form, age can only be specified where strong taxonomic evidence is present, and where either fusion, texture, or architecture so indicate. Size (for a taxonomically indefinite piece) provides only rough taxonomic clues, (e.g., deer-sized). Where a piece is taxonomically sub-definite, size may suggest species. For example, very large Neotoma materials are most likely from the massive N. cinera. Where a piece is sufficiently definite taxonomically to permit age estimation, size may permit sexual inference for dimorphic species; for example, eagle bones that are very large for their age are probably female, but very large deer bones are probably male. For some dimorphic species, sex is determinable directly from examination of certain bones; e.g., artiodactyl crania and pelves, human crania and proximal appendicular articulations, etc.. In some species, certain bones are sexually specific; e.g.. os marsupialia, baculas. Generally, however, sex is only inferrable from overall size, only when bones can be clearly diagnosed taxonomically and/or maturationally, and only for sexually dimorphic species. In most cases, element identity, completeness, and condition will make clear the interpretation of size, age, and sex. Thus, a piece identified as "Artiodactyl, rib, shaft fragment, Large" cannot be inferred to be male on the basis of size; conversely, a piece identified as "Odocoileus, tibia, proximal" may be assumed to be fused, mature, and large if male is specified.

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Appendix 9-1 • Abbreviation Keys for Data Listings

Burning Abbreviations

B	Black
BB	Broken before burning
B	Blue
Br	Brown
CA	Chalky
CH	Charred
FB	Burned fresh or in-flesh
G	Gray
H	Hard or porcelainized
R	Roasted
W	White
?	Uncertain
_	Unburned (no entry)

Portion Abbreviations

A	Anterior
C	Complete
D	Distal
D+S	Distal and shaft
F	Fragment
NC	Nearly complete
NP	Neural process
P	Proximal
P+S	Proximal and shaft
?	Uncertain
_	Irrelevant

Taxon Abbreviations

ARTIO	Artiodactyl
CAN	Canadensis
D	Dipodomya
HEM	Hemionus (mule deer)
I=INDET	Indeterminate
L	Large
LAG	Lagomorph
M	Medium or mammal (see context)
O	Odocoileus or Ovis
ODOC	Odocoileus
REF	Referred to
S	Small
SO	Size of
SYLV	Sylvilagus
?	Moderate certainty

Fusion, Age, Size and Sex

A	Adult
F	Fused
J	Juvenile
L	Large
m	Probable male
M	Mature
N	Infant, foetal, very young, neonate
O	Old
P	Partially
S	Small
U	Unfused
V	Very
Y	Young
?	Uncertain
-	Irrelevant

Condition Abbreviations

AP	Artificial polish
BM	Bone meal
C	Cutmark
DG	Dog gnawing
ER	Eroded
FR	Fresh
GP	Gastric polish or evidence of scat
HG	Human gnawing
KR	Crushed
LE	Leached
RD	Rodent or dog and human gnawing
RE	Root etched
SE	Surface exposure weathering
V	Very
W	Weathered (inspecific)
WO	Worm damage
?	Uncertain
-	Archaeological; extremes of condition absent or obscured by burned state

Element Abbreviations

ACET	Acetabulum
Bull	Auditory bulla
CALAC	Calcaneum
FEM	Femur
FRON	Frontal
HUM	Humerus
ILIU	Ilium
INNO	Innominate
LB	Long bone
Mand	Mandible
Max	Maxilla
MC(#)	Metacarpal (number if known)
MP	Metapodial
MT(#)	Metatarsal (number if known)
OCCI	Occipital
PH (M or L(#))	Phalanx. medial or lateral, joint (if known)
Rad	Radius
RIB (#)	Rib (number if known)
SCAP	Scapula
SHEL	Shell
SKUL	Skull
TEMP	Temporal
TIB	Tibia
C	Vertebra: cervical or
Ver T(#)	Lumbar or thoracic &
L	number if known
ZYOGO	Zygoma
?	Uncertain

Farmington Data, Listings, and Observations

Site	FS	Taxon	No.	Element	Port	LAT	Sex, Age Size, FUS	Burning	Condition	Notes
1-1	48	ILM	4	?	?	?	?	CA.G	LE	
	49	ILM	1	LB	SF	?	?	CA.G	LE	
		SOLEPUS	1	FEM?	SF	?	?	FB	C?	
		INDET	2	LB?	SF?	?	?	-	SE.LE	
	50	soLEPUS	1	HUM?	SF	?	?	FB.BLW	-	
	54	soLEPUS	1	ULNA?	SF	?	?	FB.GB	KR	
1-5	2	O.reFHEM	1	TIB	D+S	R	LMm		SE.DG	1
	3	O.reHEM	1	CALC	C	R	LMm		SE.DG	
2-8	80	LEPUS	3*	MT4	S	R	?	H.B	AP?	
	81	NEOTOMA	1	TIB	S	L	L	H.B		
		so NEOTOMA	3	LB	SF	?	?	H.B		
	83	so-NEOTOMA	6*	ILIU?	PF	?	?	CA.W	LE	
	85	LIM	1	?	SF?	?	?	CH.Br	LE	
		INDET	1	?	SF?	?	?	CH.Br	LE	
2-16	38	HALIOTUS?	5	SHEL	-	-	-	-	WO	
	45	D.ORDII	1	HUM	D	R	F		v.FR	
	52	SYLV	1	HUM	P=S	L	PF		REC.C?	
		so-SYLV	4	TIB?	SF	?	?		RE.WE	
		reFODOC	1	HUM	DF	?	?	R?	WE	
		ILM	2	HUM?	SF	?	?	R	RE	
		ILM	1	VER	NP	?	?	R	RE	
		ILM	1	RIB?	SF	?	?	R	RE	
		ILM	62	LB	SF	?	?	R	RE	
		ILM	8*	-	?	?	?	R	BM	
	53	HALIOTUS?	1	SHEL	-	-	-	-	WO	
	54	ARTIO?	6*	RIBI?	SF	?	?	CA.G		
	56	ISM	!	VER?	F	?	?	R?	RE	
		ODOC/ O.CAN	1	HUM	SF	L	L	-	RE	
		ILM	41	LB	SF	?	?	R?	ER.RE	
		ILM	5	VER	F	?	?	R?	ER.RE	
	60	NEOTOME	MUMMIFIED LARGE IMMATURE-NO SPECIES DETERMINED.							

Farmington Data, Listings, and Observations (continued)

Site	FS	Taxon	No.	Element	Port	LAT	Sex, Age Size, FUS	Burning	Condition	Notes
2-17	34	so-SYLV	3	LB	SF	?	?	H.W		
	68	ISM	1	LB	SF	?	?	CA.G	LE	
	69	so-LAG	3	LB?	F	?	?	R	WE	
		ILM	1	LB	SF	?	?	CH.W	WE.LE	
		ILM?	4	LB?	F	?	?	CH.W	WE.LE	
	71	so-LAG	1	LB?	F	?	?	G	LE	
6-5	33	reSYL	2*	TIB?	SF	?	?	H.BBr		
	34	refCYNOMYS	1	FEM	C	L	PFF		LE	
		NEOTOMA	1	INNO	NC	R	F	R		
		M.RODENT	1	MAND	NC	R	N		v.FR	
		so-NEOTOMA	4*	LB?	SF	?	?		WE	
		SYLV	1	ILIU	NC	R	L	H. B.BB	HG	
		LEPUS	1	ACET	F	R	F	H.B.BB		
		LEPUS	1	ZYGO	F	L	?	H.B		
		LEPUS	2*	HUM	D	R	L	H.B		
		ISM	1	SKUL	F	?	?	R		
		ISM	2	LB	SF	?	?	CA.G		
		INDET (LM?)	1	?	F	?	?	H.B		
	36	CYNOMYS	1	TIB	C	R	Y.UPF		FR	
		refCYNOMYS	1	TIB	PF	L	F		V.FR	2
		L.SCIURID	1	MAND	NC	R	SY		v.FR	
		L.SCIURID	1	MAND	AF	R	SY		V.FR	
		NEOTOMA	1	FEM	P	R	F	R	-	
		ERETHIZON	1	MAND	D+S	R	V.O		EW.DG	
		ISM	5	LB	SF	?	?	-	FR.GP	
		ISM	1	LB	SF	?	?	-	RE	
		INDET	1	?	F	?	?	-	WE	
		SYLV	1	MAND	D+S	L	L	FB	-	
		SYLV	1	MAND	D+S	R	L	-	v.FR	3
		SLYV	1	MAND	C	L	L	-	v.FR	4
		SLYV	1	INNO	C	R	F	-	RD.FR	
		SLYV	1	SCAP	SF	L	?	R	-	
		SLYV	2	ZYGO	F	P	ML	-	FR	

Site	FS	Taxon	No.	Element	Port	LAT	Sex, Age Size, FUS	Burning	Condition	Notes
6-5	36	refSYLV	1	FRON	C	R	N	-	FR	
		refSYLV	1	TEMP	C	R	N	-	FR	
		LEPUS	1	BULL	C	L	Y	-	FR	
		LEPUS	1	OCCI	F	-	Y	G	-	
		LEPUS	1	MAX	C	L	Y	R	-	
		LEPUS	1	MC2	D	R	Y.U	-	FR	5
		LEPUS	1	VER.L	NC	-	PF	R	-	
		LEPUS	1	HUM	D+S	L	F	-	v.FR	
		LEPUS	1	SCAP	D+S	L	F	-	v.FR	
		LEPUS	1	ACET	F	R	F	CA.G	-	6
		LAG	1	TIB	SF	?	?	-	FR	
		ODOC	2*	PHM3	C	?	SM	H.B	-	
		ARITO	1	RIB	SF	?	?	-	FR.GP	
	38	SYLV	1	TIB	D+S	R	F	R	-	
		LEPUS	1	VER.L	NC	-	FU	-	HG	
		ODOC	1	RAD	P	R	L	R?	LE	
8-1	1	ODOC	1	PHM3	C	?	J.YA	-	SE	

*Thought to represent one piece broken in excavation.

<u>Notes</u>

1. Axe-cuts (steel).
2. Flesh adhering.
3. Probably same individual as preceding piece.
4. Individual distinct from preceding piece.
5. A typical double epiphysis.
6. Ochre? stain.

Chapter 10 • FA 2-13 Faunal Remains

Jack B. Bertram

Introduction

This report presents the results of an extensive analysis of some 12,000 bone pieces from Site FA 2-13, an Archaic/Basketmaker site excavated as part of the Elena Gallegos project.

The materials from FA 2-13 are unique in the author's experience. Perhaps 98 percent of the collection consists of small, effectively unidentifiable fragments, the bulk of which are burned to a variable degree. Only about 100 pieces were completely identifiable; perhaps another 200 pieces were identifiable to a lesser degree.

Attainment of many of the goals of modern faunal analysis was therefore not feasible in this study; rather, the author chose to focus on potentially informative details of the fragmentary portion of the bone assemblage.

All identifications were carried out using the excellent collection of the Museum of Southwestern Biology, University of New Mexico, Albuquerque, New Mexico.

Remarks

Any experienced faunal analyst can readily separate fully identifiable bone fragments from those that are in practice unidentifiable. He or she may later find that some pieces thought to be fully identifiable are in fact insufficiently distinctive to warrant a full diagnosis. All comparative collections, furthermore, are incomplete, as will be the best analyst's anatomical knowledge.

A result of most diagnostic analyses is, then, a tripartite division of a collection into: (1) fully and certainly identifiable pieces; (2) incompletely or less certainly diagnosed pieces; and (3) pieces for which all but the most general diagnosis is inappropriate. Some analysts attempt a further breakdown into unidentifiable pieces of various architectures, in an attempt to use architectural variation as a basis for more exact diagnosis.

Over the past several years the author has developed a series of rules on the relationship of bone dimensions to full taxonomic identifiability. These rules are as follows:

1. Any animal of fox-jackrabbit size or smaller has very few loci within its skeleton greater than 15 mm. in length or greater than 2 mm. in thickness from the outer to the inner surface of the compactum, which are not readily identifiable by their characteristic architecture at least to the level of body size.

2. Any animal smaller than a medium ground squirrel has very few bones or fragments of bones which are unidentifiable if greater than 7 mm. in length or 1 mm. in thickness.

3. Very large animals, by contrast, possess numerous skeletal loci which are unrecognizable if broken shorter than 15 mm. or thinner than 2 mm.; many large animal fragments are very thin. Additionally, a variety of cultural and taphonomic processes can produce large animal bone fragments which both architecturally and in thickness are indistinguishable from smaller animal fragments.

4. Similarly, many medium-sized animal bones commonly break into fragments which are indistinguishable from those of smaller mammals.

5. As a result, any fragment of no architectural distinction which is longer than some 15 mm. or thicker than 2 mm. is almost surely that of an animal larger than a fox, while any fragment (otherwise undistinguished) longer than 7 mm. or thicker than 1 mm. is almost surely that of an animal larger than a ground squirrel. Fragments smaller than 7 mm. and 1 mm. are potentially from a mammal of any size.

Using these criteria, the author sorted the unidentifiable fragments into <u>large</u>, <u>medium</u>, and <u>small</u> groups. The results were further subdivided into categories according to whether they were (1) burned black, brown, or tan; (2) burned to a white, blue, or pale gray cast, or (3) weathered, leached, or etched by roots, soil chemicals, or exposure. No fresh unidentifiable bone was encountered.

It was hoped that this classification would aid in the identification of differential use areas within the site. In practice, telling weathered from cooked or lightly burned bone was often difficult unless specimens were freshly broken; consequently, the observed numerical differences between these two conditions are probably unreliable in some cases.

Diagnostic Results

Approximately 12,000 pieces of bone were examined. Of these 79 were fully identifiable: 17 artifacts exhibiting work and 62 fully identifiable anatomical parts with no work (Tables 10-1 and 10-2). Of the identified parts, 25 were of <u>Odocoileus</u> ref. <u>hemionus</u> (mule deer), 20 were of hare or rabbit (<u>Lepus</u> or <u>Sylvilagus</u>), and 7 were of small or medium rodents (Appendix 10-1). Some 170 bones were partially identifiable with more precision than body size (Table 10-3). These all appear to relate to the precisely identified forms, excluding one possible colubrid snake vertebra. Some 11,800 bone fragments were unidentifiable; these pieces are tabulated in Table 10-4.

All fully recognized taxa save one or two small rodents were represented by burned elements, and one can conclude that these forms were cooked and eaten at FA 2-13. It is difficult to evaluate the number of animals present; only cottontail is clearly represented by more than one animal (palate fragments, FS 2016 and 2030). The author believes that two deer are also present, although this opinion is based on rather subjective criteria and may be the result of post-mortem distortion of parts from one animal. The possibility of more than one deer is also supported by the only two unequivocally redundant deer bones in the sample. These speciments (FS 2057 and 2060), while they are of different fusion states, are both vestigial lateral metapodials. This bone is variable in expression, almost never available in museum collections, and frequently resorbed by the animal in life (Louis R. Binford, personal communication). Nowhere in the literature is it described in detail sufficient to permit a judgement of individual differences based on fusion state.

The author has elsewhere reviewed the representational biases resulting from cultural and taphonomic actions on the bones of animals of differing body size (Bertram and Draper 1983). It is sufficient here to note that where meat and other faunal resources are frugally exploited,

Table 10-1. Worked Bone.

Source FS No.	New FS No.	Provenience	Condition and Description
117	2000	108N102EG3L1	Annular bead fragment, 3 mm width, burned white, lagomorph or bird bone.
186	2004	106N101EG9L2	Intact annular bead, 9 mm diameter, 3 mm width, burned white, weathered, lagomorph or bird bone.
240	2006	108N104EG7L3	Large mammal fragment, ground, burned.
465	-	110N103EG12L4	Large mammal shaft fragment, heavily ground, bilaterally burned after breaking, root-etched.
488	2019	106N106EG30L1	Annular bead fragment, 10 mm diameter, 3 mm width, burned? weathered! lagomorph or bird bone.
764	2027	110N105EG31L4	Tubular bead fragment, 1 mm diameter, incised and ground, not burned, small mammal bone.
768	2028	106N105EG29L4	Annular bead (too tiny to measure but probably like others above) burned white.
832	2042	109N103EG4L3	Four annular bead fragments, approximately 9 mm diameter, 2 to 4 mm in width, burned black, very thin, lagomorph or bird.
887	2048	Fea 1, 107N104EL2	Annular bead fragment, tiny. Refer to FS No. 888. Burned black.
888	-	F.1, 107N104EL2-3	Five annular bead fragments, burned black. Lagomorph or bird bone.
944	2053	105N102EG11L3	Annular bead fragment, burned. Consistent with others above.
945	-	105N102EG11L3	Annular bead frag, 12 mm dia, 4 mm width, variably burned. Described as "Human Molar Frag."
952	2054	106N102EG9L3	Ditto No. 945, Annular bead frag.
967	-	104N102EG18L1	Two annular bead frags, 10 mm dia, 5 mm width, variably burned. Bird or Lag. bone.
974	2056	109N105EG14L4	Medium or large mammal fragment, cut marks, burned white.
974	2058	109N105EG14L4	Possible awl tip, ground, polished, weathered.
1024	2062	108N103EG6L3	Annular bead frag. Burned?

Provenience code key following Table 10-2.

archaeofaunal estimates of abundance are likely to underestimate small form abundance and overestimate large form numbers. This is due primarily to the enhanced recognizability of large form fragments, and the great numbers and wide distribution of those fragments resulting from thorough and frugal use. Bone fragments from larger animals are also more durable in an archeological deposit.

It is not currently feasible to attempt an estimate of the total animal population present in the FA 2-13 collections. It may be suggested, though, that numerous small forms and perhaps two deer or parts of two deer were consumed and discarded on the site.

Seasonality

Several lines of evidence suggest that FA 2-13 was occupied in late fall or early winter. These are:

1. The presence of a nearly full-sized, immature cottontail (FS 2034, FS 2051). Summer, early fall, or overwintering rabbits would generally exhibit more complete vertebral apophyseal fusion unless they were kindled very early in the spring (Bailey 1931; Tiemeyer and Plenert 1964).

2. The presence of a large ground-dwelling sciurid, either prairie dog or (much less likely) spotted ground squirrel (FS 2055). Both of these forms become dormant in very cold weather, although praire dog can occasionally be taken on warm winter days (Bailey 1931; 128-131).

3. The presence of a nearly intact mule deer antler (FS 452). Although the condition of this specimen makes determination difficult, it clearly was not in velvet, but had not been long exposed (if shed) when it was probably burned and rapidly buried.

Table 10-2. Identified Elements.

Source FS No.	New FS No.	Provenience	Description
119	2001	106n103EG2l2	Sylvilagus metatarsal, right 3rd, proximal fragment, burned black.
133	2002	106N103EG2L4	Sylvilagus tibia, left, shaft fragment, weathered, leached.
180	2003	109N104EG5L2	Odocoileus ungle, lateral, intact, weathered.
188	2005	110N103EG12L1	Sylvilagus metatarsal, left 2nd, proximal fragment, burned black.
240	2007	108N104EG7L3	Odocoileus ungle, medial distal, burned after breaking.
240	2008	108N104EG7L3	Odocoileus phalanx, lateral 1st, distal, fused, burned black.
240	2009	108N104EG7L3	Sylvilagus mandible, right, anterior, burned black.
244	2010	108N104EG7L3	Sylvilagus rib, proximal, burned black.
319	2011	109N105EG14L3	Sylvilagus tibia, left, distal, fused, burned black.
319	2012	109N105EG14L3	Sylvilagus metacarpal, right 4th, intact, fused, leached.
388	2013	108N106EG17l5	Odocoileus Phalanx, lateral 1st, intact, fused, burned black.
395	2014	109N106EG15l6	Sylvilagus PM, complete, very weathered.
395	2015	109N106EG15L6	Odocoileus ungle, medial, distal, burned.
395	2016	109N106EG15L6	Sylvilagus palate, left, posterior, very weathered.
452	(2017)	110N103EG12L4	O.hemionus antler, right, tines and base gone.
110.80x103.69x100.00			September to June, eroded, leached, etched, delicate. Possibly burned.

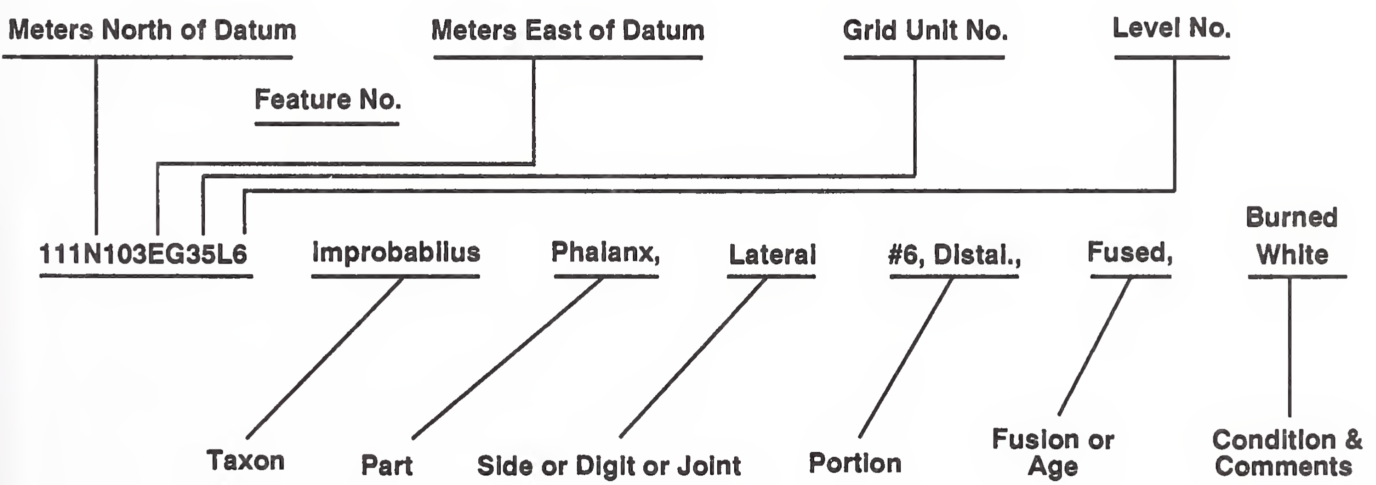
Table 10-2. Identified Elements (continued).

Source FS No.	New FS No.	Provenience	Description
466	(2018)	110N103EG12L4	Odocoileus scapula, right, distal, fused, burned black. Probable butchering of inferior articulatory margin. Burned while fresh (in flesh?).
501	-	101N103EG12L5	Odocoileus sphenoid, right, greater wing, leached and weathered.
548	2020	105N103EG22L3	Odocoileus ungle, lateral, intact, burned black.
552	2021	Fea. 2 107N103EG19L1	Thomomys femur, right, intact, fused, intrusive?
582	2022	106N105EG29L3	Odocoileus ungle, lateral, intact, fused mature, weathered.
599	2023	110N106EG32L5	D.spectabilis PM4, paired, fragmented, eroded and friable.
663	-	110N105EG31L5	Odocoileus mandible, left, anterior, burned white.
719	(2024)	111N04EG35L4	Odocoileus metacarpal, left, distal, near complete fusion, leached.
764	2025	110N105EG31L4	Odocoileus tibia, left?, distal, fused, burned and leached.
764	2026	110N105EG31L4	Odocoileus phalanx, lateral no. 2, intact, burned white.
787	2029	109N106EG15L5	Sylvilagus phalanx, first, intact D.3 pes, fused, burned black.
787	2030	109N106EG15L5	Sylvilagus palate, bilateral, posterior, fused, light burning and leaching.
793	2031	108N106EG17L6	D.spectabilis Vert, lumbar no. 7, intact, fused, friable (weathered?).
793	2032	108N106EG17L6	Sylvilagus phalanx, pes, first, distal, fused, burned black.
799	2033	106N104EG28L4	Perognathus incisor, intact, fresh.
802	2034	107N102EG33L3	Sylvilagus metatarsal, distal, partly fused, burned white.
809	2035	110N104EG13L4	Odocoileus unciform, left, intact, burned black.
809	2036	110N104EG13L4	Lepus pubis, right, anterior, burned and eroded, identification insecure.
813	2037	106N104EG28 Fea. 2, L.1	Lepus humerus, right, distal, fused, leached.
819	2038	107N104EG20 Fea. 2, L. 1	Sylvilagus humerus, right, distal, fused, stained, probably burned.
828	2039	107N105EG26L2	Odocoileus metapodial (MT?), distal, fused, burned then weathered. Identified on spool angles.
832	2040	109N103EG4L3	Sylvilagus mandible, right?, medial/lateral, very weathered.
832	2041	109N103EG4L3	Odocoileus phalanx, lateral no. 2, intact, fused, burned. Atypically thick.
840	2043	107N106EG27L1	Odocoileus ungle, medial, distal, weathered and damaged in excavation.
844	2044	107N103EG19L3	Odocoileus calcaneum, left, intact, fused, burned, damage on lateral articulator.

Table 10-2. Identified Elements (continued).

Source FS No.	New FS No.	Provenience	Description
858	2045	107N104EG20L1	Odocoileus cubonavicular, left, distal, broken prior to burning black.
864	2046	108N103EG6L4	Odocoileus cubonavicular or bicuneiform, right, light burning.
864	2047	108N103EG6L4	Sylvilagus astragalus, right, intact, fused, lightly burned and weathered.
904	2049	109N104EG5L3	Odocoileus phalanx, lateral no. 1, intact, burned.
904	2050	109N104EG5L3	Neotoma, M^3, left, intact, burned variably.
910	2051	105N102EG11L4	Sylvilagus, ver. th., centrum, unfused, burned white. This diagnosis shaky.
917	2052	110N103EG12L3	Lepus falcula, pes no. 2, intact, large, burned? weathered, stained.
955	2055	108N104EG7L4	Cynomys, IL, left, intact, weathered.
974	2057	109N105EG14L4	Odocoileus Metapodial, vestigial lateral, intact, fused, burned black.
995	2059	111N104EG35L4	Odocoileus, phalanx, lateral no. 2, intact, burned white in flesh.
1000	2060	111N103EG34L2	Odocoileus vestigial lateral metapodial, distal, not fused, burned white. CONTRAST WITH FS# 2057!
1011	2061	111N104EG35L3	Neotoma scapula, left, distal, fused, extremely weathered.

Table 10-2. Key



Quantitative Studies and Results

The information value of bones, unlike some other archeological categories, need not be restricted to one or two domains of archeological inference. The highly fragmented character of the FA 2-13 materials necessitated approaches more typical of lithic debitage or ceramic studies to answer questions more usually asked of these remains, such as activity distribution and synchronicity of deposition.

FA 2-13 is an example of a poorly understood, although common, site type in the Southwest: the burned-rock midden. It also appears to belong to a most significant and little-understood temporal period: the Archaic-Basketmaker transition. In this light, one of the more important and interesting questions to be asked concerns the relationship, spatial or functional, between the prominent fire-cracked rocks that define the site and the fragmented and variably burned faunal remains. A related question concerns the stratigraphic integrity of the poorly consolidated dune matrix, containing as it does materials of greatly differing densities.

The distribution of bone materials within all excavation units was tallied as number of fragments per level per grid unit, and plotted (Fig. 10-1). Immediately evident was a strong tendency for faunal remains to be most abundant at intermediate depth, and less at lower and higher levels. In most grid units, the level richest in bone appears to coincide with the level richest in fire-cracked rock, suggesting that post-depositional processes have been active everywhere, but generally not intense enough to do more than disperse a portion of the bone material vertically relative to the rock level.

There are problematic grids in the southeastern area of the site and on the western and northern boundaries. In each of these grids (3, 20, 23, 26, 27, 28, and 34), there appears to have been two concentrations of bone fragments, separated by a level containing significantly fewer bones. These observations suggest that an occupational hiatus is present. Supporting this speculation are several bones which evidently were subjected to surface exposure weathering prior to being burned, most clearly evident in FS 632.

Whether there were one or two occupational episodes, it is clear from Fig. 10-1 that stratigraphic integrity is unlikely for the archaeofauna. Consequently, all materials were pooled within a given grid unit and standardized by excavated volume. The resulting grid total counts are plotted in Map 10-1. If this plot is compared with the counts for fire-cracked rock from each grid unit (Map 10-2), it will be noted that the bones and rocks exhibit somewhat similar distributions across the site, but that the bone cluster is displaced to the north by perhaps 2 m. As a more rigorous check of this visual comparison, absolute numbers of bone pieces were plotted against rock counts (Fig. 10-2). The resulting plot shows that bones and fire-cracked rock have different spatial distributions and not simply "noisy" distributions.

Similarly, artiodactyl fragments do not covary with either total bone or total rock. Recognizable artiodactyl parts tend to concentrate just west of the major rock concentrations.

Neither artiodactyl nor small mammal preservation (as measured by number minimally recognizable per hundred fragments) appear to vary significantly across the site, although both are unusually low in Grid 5 and unusually high in Grid 19. Perhaps these patterns reflect site use; the area to the west of the fire-cracked rock concentration (Grid 19) may have experienced less traffic than the area between the hearths (Grid 5). As a result, Grid 19 would tend to show less bone fragmentation. It is important to note that the bulk of the partially identifiable artiodactyl material in the south and west portions of FA 2-13 is made up of tooth fragments, while the north and east site areas tend to contain bones associated with edible meat, skin, or grease.

Numerous unidentifiable fragments (usually burned white) which could plausibly be artiodactyl rib, skull, or vertebral fragments were noted in the course of the study. There was no clear evidence for upper limb bones. Artiodactyl skull parts, however, were found, as were a multitude of artiodactyl tooth fragments.

The only artiodactyl remains preserved intact in any quantity were toe bones. Of these, medial phalanges were invariably broken prior to burning, while medial ungles were sometimes intact. Surprisingly, the most common intact elements were dew-claw parts (lateral phalanges and metapodials). Eleven of 25 recognized deer bones were dew-claw parts, mostly intact.

The apparent abundance of fragmented axial artiodactyl parts, the absence of upper limb bones, and the tendency for only marrowless bones to have remained unbroken, suggest extremely frugal, exhaustive use of artiodactyl resources. These patterns would be consistent with either of two interpretations of the function of FA 2-13. The site could have served either as a processing station from which boned meat, intact upper limbs, and those portions generally easy to preserve and transport were exported. Alternatively, the site could have been a hunting/base camp in which literally all edible matter was recovered and all bones worth breaking (even marginally) were in fact processed to total destruction.

Table 10-3. Partial Identifications.

FS No.	Grid	Level	Taxon	Part	Description
115	2	1	A	S	Petrous Bone? Burned White.
117	3	1	A	T	Weathered.
119	2	2	A	T	Two inches.
121	3	2	SM	B	Shaft fragment, burned white.
127	2	3	A	T	Leached.
139	2	5	A	T	Two, very eroded.
			SM	B	Xyphosteum?
162	9	1	A	T	
164	4	1	SM	S	Burned brown.
177	11	1	A	T	Leached.
180	5	2	A	T	Weathered.
186	8	2	A	F	Burned white.
			A	T	Three inches.
			A	S	Parietal? Fragment burned variably.
191	13	1	A	T	Burned.
195	7	2	A	T	Burned white.
202	6	2	A	B	Rib fragment, charred.
240	7	3	A	B	Rib fragment, burned.
			L	MT	Burned.
248	10	2	A	F	Burned.
251	11	2	A	S	Dentary fragment, burned white.
				T	Two, weathered after burning.
256	14	1	A	T	Weathered, leached. Burned?
274	9	2	A	T	Seven, weathered.
				B	Lumbar vert fragment, burned.
			L	MT	Percent 5 fragments, burned.
276	16	1	A	T	Burned, leached, root etched.
280	10	3	A	T	Burned, leached, root etched.
285	14	2	A	F	Burned black.
293	16	2	A	F	Burned blue-white.
				T	Very weathered.
			SM	MT	Burned variably.
302	17	2	A	B	Proximal rib fragment, burned.
304/9	5	3	A	T	Radius or metacarpal shaft fragment, burned variably.
319	14	3	SM	B	Tibia fragment, burned black.
388	17	5	L	B	Femur shaft, etched, rather fresh.
395	15	6	A	MT	Shaft splinter (10 cm) weathered.
				MT	Metatarsal distal spool, very weathered.
453	12	4	A	MT/B	Shaft splinter, greenstick break, unburned, ash-stained.
464	12	4	A	MT	Calcaneum? Medial fragment, broken after burning, cartilages present when burnt.
468	12	4	A	B	Acetabulum? Fragment, burnt after breaking while fresh.
479	28	2	A	T	Unburnt, weathered lightly?

Table 10-3. Partial Identifications (continued).

FS No.	Grid	Level	Taxon	Part	Description
496	31	1	A	B	Shaft fragment, clearly burnt while fresh.
511	22	2	A	T	Burned white.
521	32	2	A	B	Rib fragment, black.
548	22	3	A	MT	Metapodial distal fragment, black.
556	19	1	A	B	Rib fragment, light burning, later weathering.
584	19	4	A	MT	Metapod or astrag frag, burned white.
586	19	5	A	T	Stained or burned.
617	26	4	L	F	Weathered.
				B	Lepus rib shaft fragment? Burned black.
626	31	3	A	B	Rib proximal fragment, burnt gray after breaking.
627	31	3	A	B	Four tibia fragments? Broken in excavation, weathered.
632	13	3	A	B	Two shaft fragments burned after weathering on surface until splintered!!
656	31	4	A	MT	Burned white.
760	18	3	A	T	Leached.
764	31	4	A	T	Burned black.
				F	Burned white.
777	27	4	L/MR	B	Shaft fragment, black.
795	24	1	A	T	Burned white.
802	33	3	A	B	Lumbar fragment, brown.
807	13	3	SM	B	Scapula fragment, black.
809	13	4	A	T	Two, unerupted molar? Burned.
813	28	1F2	A	T	Four burned very weathered, ID?
815	27	2	A	S	Antler fragments (ref FS 452?).
819	20	1F2	A	MT	Burned (weathered?) brown.
				F	Black.
844	19	3	L	B	Shaft fragment, black.
				S	Two maxilla fragments, unburned, weathered.
			A	T	Seven fragments, including I3 left lower? Light burning/staining.
858	20	1F1	SM	B	Burned white.
864	6	4	A	MT	Carp/tars fragment burned black.
				F	Leached and eroded.
872	33	2	A	T	Four fragments leached.
				MT	Weathered blackened.
876	6	5	SM	B	Humerus/femur shaft very weathered, friable, burned?
878	5	5	SM	B	Burned.
			L	B	Two rib? Fragments, black.
880	19	2	A	F	Lateral ungle fragment? Burned colubrid snake? Vertebra, rather fresh.
883	23	2	A	T	Leached, burned?
885	7	6	A	T	Two inch.
887	20	2F1	A	T	Black.

Table 10-3. Partial Identifications (continued).

FS No.	Grid	Level	Taxon	Part	Description
894	7	5	A	S	Mandibular articulator fragment? Black.
				F	Eroded.
			L	MT	Burned black.
				MT	Unburned but weathered.
904	5	3	A	MT	Black. Burned white/gray.
				S	Anterior bimandibular symphysis fragment, black.
				F	Burned black.
				F	Two inches.
				MT	Black
				B	Three inches.
913	19	1	A	T	Mild weathering.
917	12	3	A	S?	(Dubious) 6 fused dentary fragments, possibly eroded prior to burning???
920	9	4	A	T	Burned white.
924	12	2	A	F	Burned.
928	20	1	A	S	Mandible fragment, very eroded.
935	5	4	A	T	Rather fresh incisor fragment.
				F	Burned.
			L	S	Palate fragment, burned black.
941	16	5	A	T	Two leached, perhaps roasted.
944	11	3	A	T	
			A	MT	Pisiform? Fragment heavily burned.
948	5	6	SM	B	Rib fragment, prairie dog or cottontail sized or small, burned black.
952	9	3	A	F	Burned white in-flesh.
				T	Burned.
955	7	4	SM	B	Burned.
962	4	5	A	MT	Burned, leached.
971	13	2	A	T	Burned white.
980	16	3	A	F	Burned white.
995	35	4	A	B	Proximal rib fragment (note on burning obscured).
1000	34	2	A	T	Leached? Tiny.
				MT	Two carp/tarsal? Fragments, burned variably.
1011	35	3	A	B	Rib fragment charred.
1024	6	3	A	S	Antler fragments... refer to FS 452.
				S	Mandible fragments, including tooth black.
				B	Rib fragment, brown.
				MT	Three tarsal? Fragments, probably burned.

Table 10-3 Key *(almost all pieces in this table are fragmentary)*

A = Artiodactyl
MT = Metapodial/podial
B = Body
S = Skull, excluding teeth
F = Foot
S = Small rodent
L = Lagomorph
SM = Small mammal
MR = Medium rodent
T = Tooth fragment

Table 10-4. Unidentified Fragments.

FS No.	Provenience	Burned Black			Burned White			Unburned			Total
		LG	MED	SM	LG	MED	SM	LG	MED	SM	
88	5M 90°		1								
91	109M 270°								1		
115	106N103EG2L1	3	16	10	3	9	8	3	24	11	89
117	108N102EG3L1		1	2	1	6	5		1	3	19
119	106N103EG2L2	1	10	4		14	8	7	65	21	130
121	108N102EG3L2	1	6	3	5	4	8	2	10	9	48
122	108N102EG3L3	2	7	14		8	12	9	10	8	70
126	108N102EG3L4	1	5		4	8	3	2	2	1	26
127	106N103EG2L3	9	21	18	2	8	12	7	12	11	100
131	108N102EG3L5	3	8	2		7	4	4	5	2	35
133	106N103EG2L4	6	7	3	2	5	5	6	14	12	60
135	108N102EG3L6	1			2	1					3
137	108N102EG3L7		2								2
139	106N103EG2L5	1	5	1	1	4	1	6	10	2	31
141	108N102EG3L5	1	2	1							4
143	106N103EG2L6		2			4	1	1	17	5	30
145	108N102EG3L10						1				1
147	106N103EG2L7		1			2		1	3		7
149	106N103EG2L8		3		1	2			5		11
151	106N103EG2L9		3					1			4
152	106N103EG2L*					1					1
				*Cleaning							
156	106N103EG2L9?						1				1
159	106N101EG8L1	1	1			7	8		2		19
162	106N102EG9L1	1	8	8	2	4	6		6	1	36
164	109N103EG4L1	6	7	2	2	15	5	5	19	7	68
166	109N104EG5L1	4	11	12	3	10	4	2	12	12	70
170	108N103EG6L1	2	8	2	4	6	5	0	1	2	30
172	108N104EG7L1		6	5		2	3	5	12	13	46
175	105N101EG10L1	1	16	10		8	3	3	7	2	50
177	105N102EG11L1	2	12	5	4	8	6	3	3	1	44
180	109N104?EG5L2	7	17	25	4	12	14	3	33	39	154
186	106N101EG8L2	6	17	14	2	12	2	2	16	28	99
188	110N103EG12L1		13	13	2	4	3	3	15	15	68
191	110N104EG13L1		12		2	9		3	4	10	40
193	109N103EG4L2	7	25	21	5	26	16	5	19	9	132
195	108N104EG7L2	6	24	10	2	21	6	5	39	25	138

Table 10-4. Unidentified Fragments (continued).

FS No.	Provenence	Burned Black			Burned White			Unburned			Total
		LG	MED	SM	LG	MED	SM	LG	MED	SM	
199	108N103EG6L2	2	37	18	3	14	7	3	13	5	102
202	108N103EG6L2	1		5	3		3		1	1	14
227	108N104EG7L3				1						1
234	018N104EG7L3				1						1
235	108N104EG7L3							1			1
240	108N104EG7L3	78	41	57	35	22	40	31	20	16	340
244	108N104EG7L3	2	60	24		4	10	1	15		116
248	105N101EG10L2	2	12	4	1	4	1	3	9	2	38
251	105N102EG11L2	3	20	12	4	10	2	2	9	4	86
256	109N105EG14L1	3	5		3	6	1	4	2		24
259	109N106EG15L1		8	2	4	5	2			1	22
266	G6L3 108.01N* *103.95 Ex 99.95D							2			2
274	106N102EG9L2	6	8	6	2	23	7	4	46	32	134
276	108N105EG16L1	2	14		2	8	2		2		30
278	108N106EG17L1	2	6	1	1	3	2	2			17
280	105N101EG10L3				1	2		1?			4
282	105N101EG10L4		2			3	1		2		8
285	109N105EG14L2	3	22	5	6	6	10	2	3		57
288	109N106EG15L2	1	4		2	1		3	1		12
293	108N105EG16L2	6	6	4		15	6	3	23	10	73
302	108N106EG17L2	5	7	1	3	23	5	7	24	10	85
304	109N104EG5L3	1									1
305	109N104EG5L3	1									1
319	109N105EG14L3	11	34	9	2	10	8	2	9	3	88
322	109N106EG15L3	7	13	1		7	6	1	4	1	40
326	108N104EG7L4?			1	1						2
333	108N106EG17L3	3	23	7	5	9	7	1	12	2	69
341	109N106EG15L4	10	13	7		9	5	1	3	15	63
347	108N106EG17L4	7	22	14	3	6	20	4	5	5	86
351	L4 109.45N* *105.15E 99.96D Probably 1 calcined piece, shattered.					1-4					1
370	110n103EG12L3				1						1
377	107N103EG19L1?	3	10	2		3			2		20
378	106N101EG8L3								1	1	2

Table 10-4. Unidentified Fragments (continued).

FS No.	Provenience	Burned Black LG	Burned Black MED	Burned Black SM	Burned White LG	Burned White MED	Burned White SM	Unburned LG	Unburned MED	Unburned SM	Total
388	108N106EG17L5	4	24	3	9	13	1	5	19	4	82
393	104N101EG21L2					3					3
395	109N106EG15L6	2	12	10		13	4	5	19	14	79
401	104N101EG21L3				1	11	4				16
404	105N103EG22L1					1					1
409	104N103EG25L1							1	1		2
417	107N103EG19L3	1									1
418	107N103EG19L3							1			1
451	107N106EG27L3	2	1	2	3	8	1	1	1	4	23
457	110N103EG12L4							1			1
458	110N103EG12L4							1			1
462	110N103EG12L4	1									1
468	110N103EG12L4	1	15	3	2*	1*	3*	3	1		29
	*Uncountable; contaminated by plaster droplets.										
470	104N103EG25L2	2									2
478	106N105EG29L1				1	2	1				4
479	106N104EG28L2					4		1			5
485	106N104EG28L2							1			1
488	106N106EG30L1				2						2
496	110N105EG31L1		1	1		1					3
499	110N103EG12L5	1	3			3	2	1	1		11
501	110N103EG12L5										0
505	106N105EG29L2	2	2		1	2	1	1	3	1	12
508	110N106EG32L1					2					2
511	105N103EG22L2		1		3	2	2	4			12
519	110N105EG31L2		1		3	2					6
521	110N106EG32L2	3			2						5
525	107N105EG26L3	1				2		3			6
527	110N106EG32L3	1				1		2			4
538	106N106EG30L2					1		1	1		3
548	105N103EG22L3	2			2	3	5	2	2	1	17
552	107N103EG19L1	7	11	3	3	4	4	3	5	4	44
553	107N103EG19L1							2 Extremely Weathered			2
554	107N103EG19l1							1 Ash-stained surface weathering?			1
555	107N103E F2F1							4 Ash-stained surface weathering?			4

Table 10-4. Unidentified Fragments (continued).

FS No.	Provenience	Burned Black LG	Burned Black MED	Burned Black SM	Burned White LG	Burned White MED	Burned White SM	Unburned LG	Unburned MED	Unburned SM	Total
556	107N103EG19L1	1 Poss weathered or leached.									1
557	107N103EG19L1							3 Surface weathered splinters, much root etching.			3
558	107N103EG19L1							2 Surface weathered + deep stain or mineral deposit.			2
578	104N103EG25L3				2	3			1		6
582	106N105EG29L3	3	1	0	7	5	3	0	2		21
584	107N103EG10L4	4	10	4	1	3	2	1	1	0	26
586	107N103EG10L5	2	1	0	4*	3		3	1		14
					*Calcined to chalk.						
588	105N103EG22L4	1	1		2	2	1		2		9
597	106N105EG29L1	0	1	0	0	1	0	0	1	1	4
599	110N106EG32L4	1	4	2	0	2		1	3	7	20
605	110N106EG32L5	1	3	0	2	2	3	6	4	1	22
614	106N106EG30L3	5	22	12	1	5	1	2	26	1	75
617	107N105eg26l4	7	27	13	0	12	6	2	17	7	91
626	110N105EG31L3										
627	11ON105EG31L3										
630	11ON104EG13L3							1			1
631	110N104E ????							2			2
632	11ON104EG13L3	2	(Definitely burned after weathering...surface splinters)								2
643	106N106EG34L4	5	26	7	4	9	3	1	21	6	82
651	11ON105EG31L4				1						1
652	11ON105EG31L4			1				1			2
653	11ON105EG31L4	1									1
656	11ON105EG31L4				3						3
662	11ON105EG31L4							1			1
663	11ON105EG31L5										
719	111N104EG35L4										
720	111N104EG35L4	1									1
758	107N104EG20L4	5	33	15	2	6	8	4	16	19	108
760	104N102EG18L3	2	11	8	1	2	3	1	6	7	41
762	11ON105EG31L3	6	22	24	1	3	6	6	12	8	88
764	11ON105EG31L4	2	71	47	5	14	9	13	18	25	204
768	106N105EG29L4	5	23	8	1	9	6	4	10	5	71
771	109N105EG14L6	5	33	12	4	7	6	2	13	5	87
775	104N103EG25L1					1			1		2

Table 10-4. Unidentified Fragments (continued).

FS No.	Provenience	Burned Black			Burned White			Unburned			Total
		LG	MED	SM	LG	MED	SM	LG	MED	SM	
777	107N106EG27L4	1	33	13	3	4	4	2	24	6	90
779	110N105EG31L5	1	35	24		10	9	9	21	5	114
783	109N103EG04L4	10	52	22		9	9	1	21	15	140
787	109N106EG15L5	7	20	21	4	16	10	2	37	6	125
								(+2 Fresh)			
791	105N104EG23L03		5	1	1	4	2	2	4	4	21
793	108N106EG17L6	7	16	6	3	9	5	7	14	15	82
795	104N104EG24L1			1	2	3	1				7
797	107N102EG33L1	2*	14*	48*		12	7	*Silted			83
								see left counts pooled			
799	106N104EG28L4	6	13	5	1	5	3	19	37	22	106
								(+2 Fresh)			
802	107N102EG33L3	5	55	9	2	8	13	8	15	6	121
804	106N104EG28L3		1			6	4	1	2	2	16
807	110N104EG13L3	1	32	37	1	9	9	9	25	17	140
809	110N104EG13L4	11	57	32	3	15	12	4	18	22	174
813	106N104EG28L1	4	12	18	2	15	8	5	34	43	141
815	107N106EG27L2	3	27	6	2	8	4	2	19	8	79
817	107N105EG26L1		10	4	2	9	10	5	16	7	63
819	107N104EG20L1	3	53	5	4	14	14	5	9	7	114
	Fea 2										
821	110N104EG13L5	2	21	15	1	10	7	2	24	10	92
823	104N101EG21L1					3		1	2		6
825	104N102EG18L4	4	6	2		1			7	3	23
828	107N105EG26L2	3	28	15	1	9	7	1	15	11	90
830	107N104EG20L3	1	7	5		5	2		6	4	30
832	109N103EG04L3	13	98	36	6	23	8	7	34	4	230
834	107N104EG20L2	2	34	11		11	6	4	32	14	114
836	108N105EG16L6	8	17	16	2	10	3	3	11	15	84
840	107N106EG27L1	2	12	17	2	9	7	1	2	12	64
844	107N103EG19L3	5	8	4	8	7	8	43	34	84	202
846	104N102EG18L5	2		5	1			2		5	15
848	104N104EG24L4	2	11	5		2	1	5	9	3	38
851	105N104EG23L1	2	4		3	7	6	3	11	2	38
855	105N104EG23L4	4	17	5		7	2	5	10	6	56
858	107N104EG20L1	11	40	25	2	10	7	6	13	9	123
	Fea 1										
864	108N103EG06L4	8	32	19	5	9	6	5	65	17	166

Table 10-4. Unidentified Fragments (continued).

FS No.	Provenience	Burned Black			Burned White			Unburned			Total
		LG	MED	SM	LG	MED	SM	LG	MED	SM	
869	106N104EG28L1	3	7	1		9	5	5	28	23	81
872	107N102EG33L2	10	14	21	3	8	12	9	26	34	137
874	104N104EG24L3	3	1	3	3	1	1		1	1	14
876	108N103EG6L5	2	17	11	1	3	3		10	6	53
878	109N104EG0FL5	3	33	22		5	3	2	11	7	86
880	107N103EG19L2	7	20	17	2	11	9	6	40	43	155
883	105N104EG23L2	1		2	4	1	2		5	1	16
885	108N104EG07L6	3	20	26	1	4	7	7	16	5	89
887	107N104EG20L2 Fea 1	6	18	4		3	1	1	2	1	36
888	107N104EG20L2 Fea 1										
892	104N104EG24L2				2	1	1	1	2 (In-flesh burning)		7
894	108N104EG07L5	2	25	22	1	5	5	1	9	3	73
904	109N104EG05L3	69	59	285	8	25	54	28	21	92	641
910	105N102EG11L4		8	6	2	3		3	2	3	27
913	107N103EG19L1	7	8	7	1	8	5	2	28	13	79
917	110N103EG12L3	13	30	31	3	15	11	12	43	28	186
920	106N102EG9L4	5	20	11	1	3	2	5	26	7	80
924	110N103EG12L2	1	19	4	2	6	3	8	13	8	64
928	107N104EG20L1	6	8	3	7	6	6	4	22	16	78
932	108N105EG16L4	13	47	15	3	16	12	4	11	6	127
935	109N104EG5L4	14	86	68	4	17	17	4	14	5	229
939	105N102EG11L5	3	3	4	0	1			2		13
941	108N105EG16L5	6	13	16	7	20	14	2	7	10	95
944	105N102EG11L3	6	12	11	5	10	12	1	14	5	76
945	105N012EG11L3										0
948	109N104EG5L6	2	13	14	2	2	7	0	2	1	43
952	106N012EG9L3	11	12	6	1	6	5	7	49	34	131
955	108N014EG7L4	8	26	12	5	10	8	3	33	25	130
959	104N102EG18L2	5	11	2	1	8	2	1	10	4	44
962	109N103EG4L5	3	24	12	0	4	3	3	5	3	57
966	104N012EG18L1	2	5	0	2	2	1	2	4	4	22
967	104N102EG18L1										0
971	110N104EG13L2	8	43	25	1	10	5	0	18	2	112
974	109N105EG14L4	19	111	58	5	18	30	3	19	12	275
980	108N105EG16L3	15	39	48	1	20	16	4	21	19	179

Table 10-4. Unidentified Fragments (continued).

FS No.	Provenience	Burned Black LG	Burned Black MED	Burned Black SM	Burned White LG	Burned White MED	Burned White SM	Unburned LG	Unburned MED	Unburned SM	Total
984	109N005EG14L5	16	77	52	3	12	10	2	24	6	202
990	111N104EG35L2	2	11	6	3	3	5	7	22	6	55
995	111N104EG35L4	2	20	22	2	7	11	3	9	13	89
1000	111N103EG34L2	3	0	9	3	8	6	2	20	16	67
1004	111N103EG34L4	7	13	10	3	2	5	2	5	5	52
1007	111N103EG34L1	2	8	10	1	4	3	1	4	1	34
1011	111N104EG35L3	2	1	8	0	5	9	5	35	21	86
1013	111N104EG35L1				3	1	4	1	7	2	18
1016	111N103EG34L3	1	14	4	2	1	3	4	6	3	38
1024	108N103EG6L3	8	22	12	3	15	8	6	67	19	160

If maximum frugal use of artiodactyl materials was to be made in the absence of durable boiling gear and without the use of skins for stone boiling containers, an aboriginally favored strategy was to lightly roast small pieces of bone, smash the roasted pieces, and suck juices from the bone fragments, which were then either swallowed or spat out (L. R. Binford, personal communication). Pieces discarded or not worth breaking would then co-occur with numerous small fragments, while pieces burned beyond use in roasting would co-occur with the hot rocks upon which they were roasted. Teeth would also occur mostly in the roasting area, since they shatter and fall free from jaws when shocked by rapid heating.

Feature Analysis

Features 1, 2, and 3 were analyzed by comparing the contents of each with adjacent materials. Feature 1, a hearth, was found to contain substantially the same distribution of various sizes and conditions of bones as its matrix, except that a higher proportion of bones were burned black in Feature 1 proveniences (FS 326, 858, 887, 888) compared to adjacent materials (FS 830, 955). Also, identifiable materials were more common in Feature 1 compared to other samples.

The contents of Feature 2, the fire-cracked rock concentration, were little different from adjacent materials, except that Feature 2 samples (FS 227, 485, 552-58, 597, 813, and 819) tended to have larger and fewer unburned fragments. Unburned fragments were significantly smaller and more numerous in adjacent samples from outside Feature 2 (FS 234, 235, 240, 244, 417, 418, 479, 582, 804, 830, 844, 880, 955). Perhaps bones were more protected from weathering by the rocks that made up Feature 2. There was also a weak tendency for blackened bones within Feature 2 to be larger compared to external samples. Curiously, neither Feature 1 nor Feature 2 was distinct from adjacent samples in the proportion of fragmentation of bones burned white.

Feature 1 fill is not exactly equivalent to Feature 2 fill. The two features contain virtually identical patterns and overall proportions of blackened bones and bones burned white. Feature 2, though, is generally richer in large unburned pieces, and poorer in medium unburned pieces. This would imply that Feature 1 contents, originally distinct from Feature 2 contents, were mixed within the Feature 1 area, either deliberately, or after abandonment.

Feature 3 held few bones and was therefore not analyzed, except to note that one of the two items found within it, an Odocoileus metacarpal fragment, was unburned (FS 719).

There was little evidence of disturbance of the site. Unit 19 showed probably intrusive rodent and herpetofaunal materials. A rodent burrow may have been present in this unit, in Feature 2, Level 1 (FS 552) and in nonfeature Level 2 (FS 880).

Summary

Some 12,000 bone fragments and identifiable pieces from FA 2-13 were found to be: (1) distributed disjointly

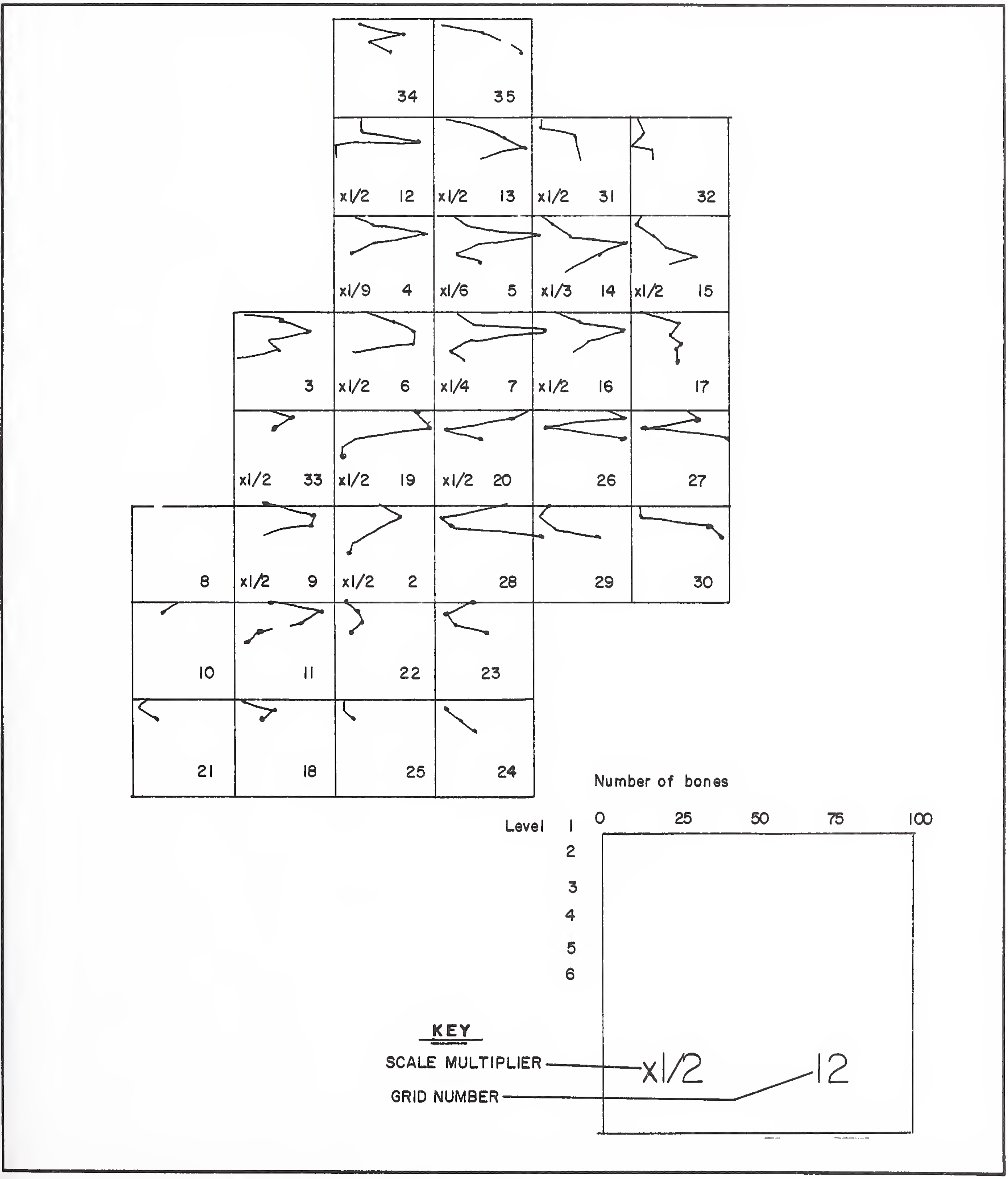
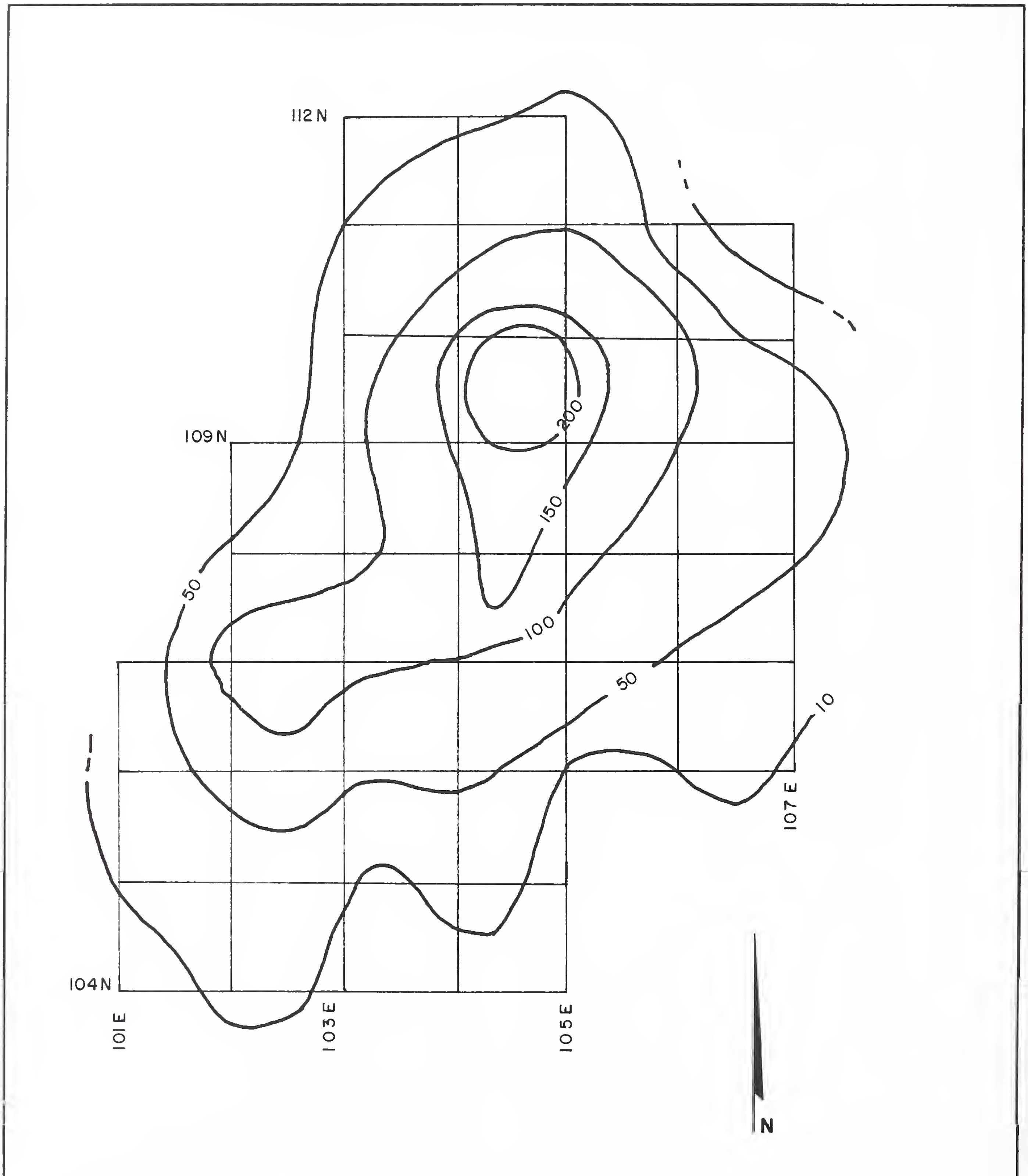
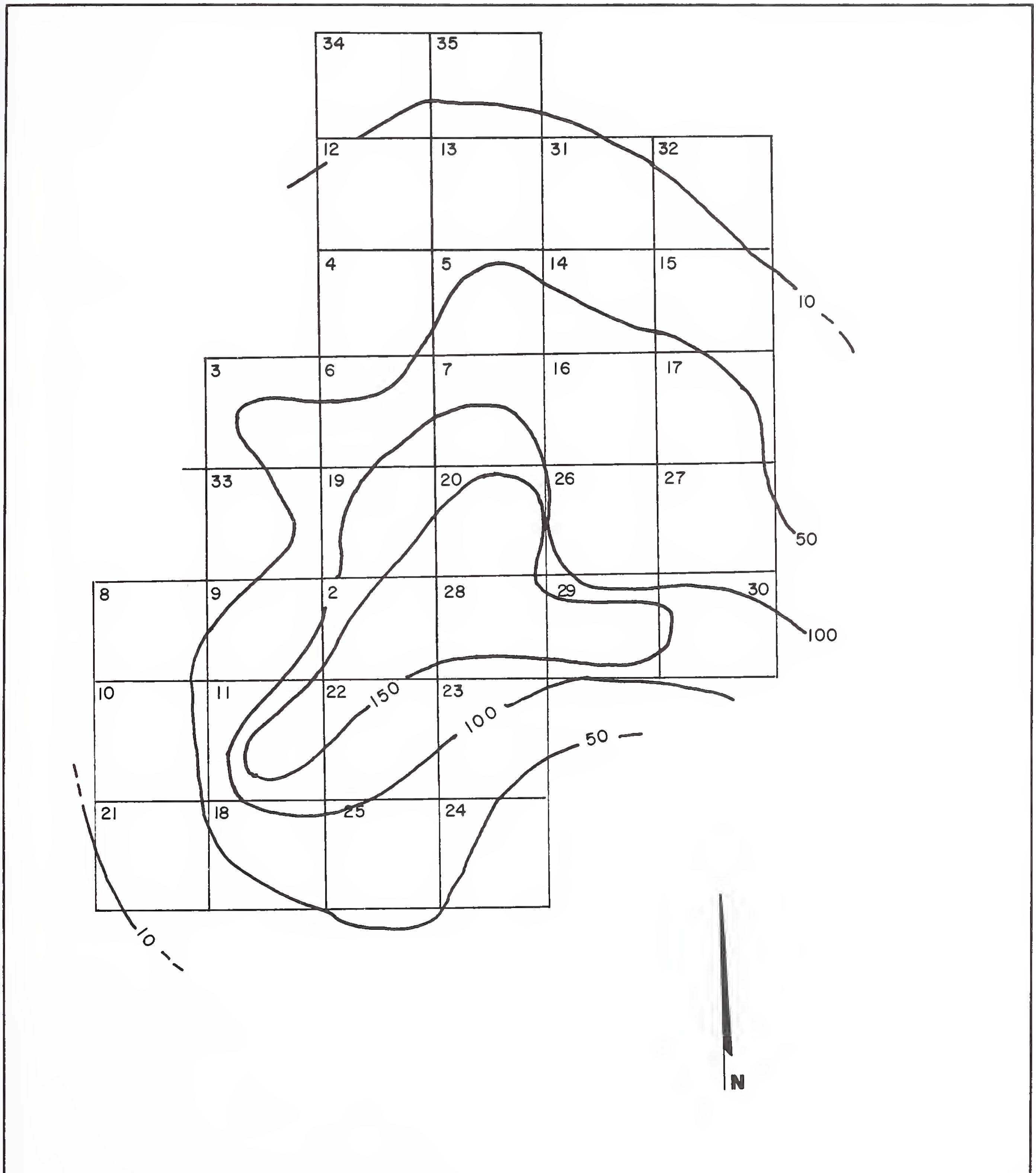


Figure 10-1. Site FA 2-13, plots of numbers of bone fragments per grid level for each grid unit.



Map 10-1. Site FA 2-13, contour map of bone density.



Map 10-2. Contour map of fire-cracked rock.

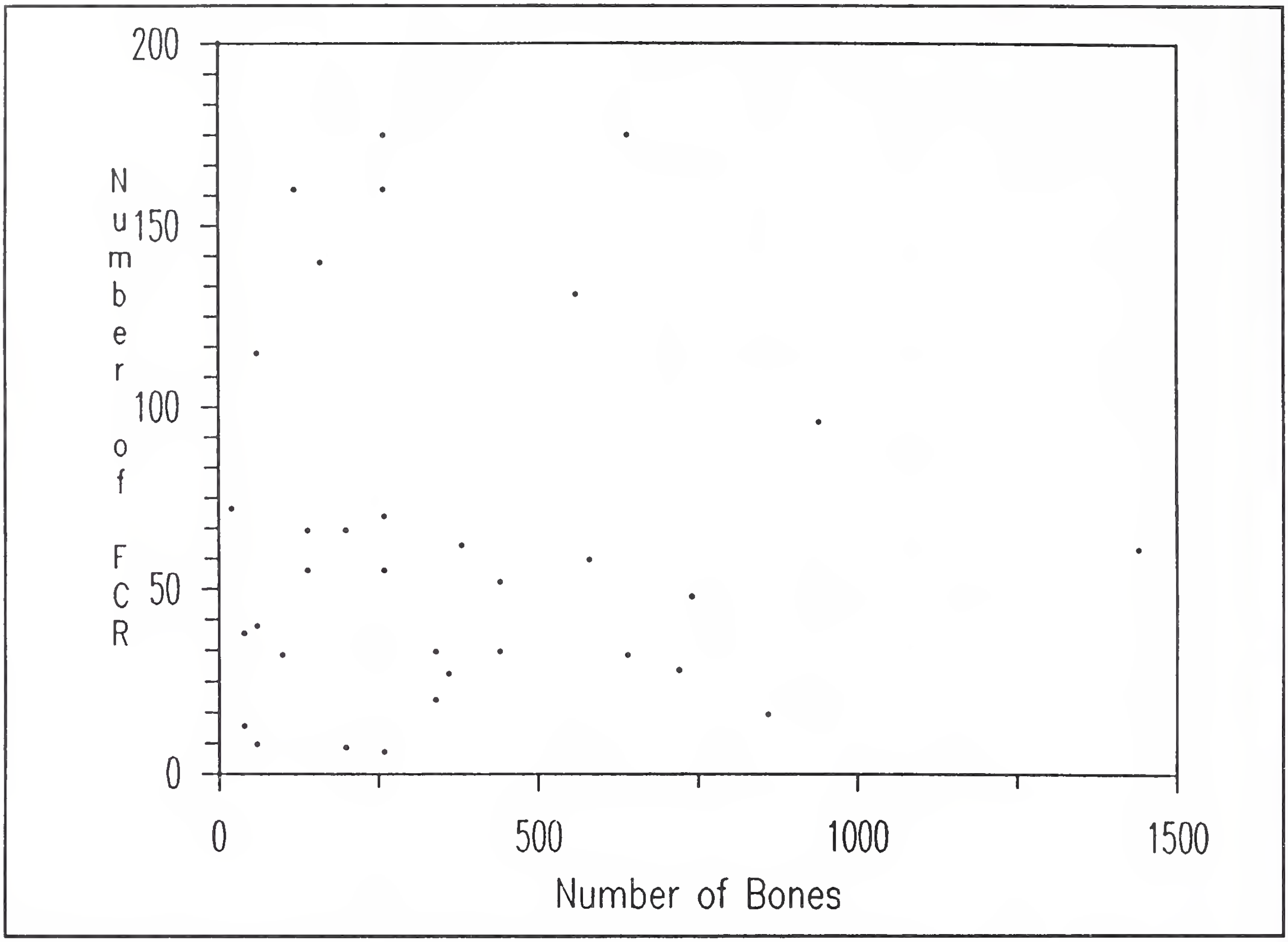


Figure 10-2. Site FA 2-13, plot of bone counts versus counts of fire-cracked rocks.

with fire-cracked rock; (2) concentrated in the area between hearths; (3) not differentiated strongly across the site in terms of taxonomic identify, breakage, or conditions; and (4) vertically dispersed as a result of post-depositional events. THe stratigraphy of the site was found to be rather complex, on both quantitative and qualitative grounds. There are two, partly conflated, occupational levels.

Site FA 2-13 was probably occupied late in the year. The inhabitants consumed one or two deer or the processed leavings of deer, two or more cottontail rabbits, at least one woodrat and one jackrabbit, and perhaps a pocket gopher, a pocket mouse, a bannertail kangaroo rat, and a prairie dog. Cottontail and deer are represented by most body parts, although toes, dew-claws, and teeth dominate the deer/artiodactyl material. These remains suggest either exportation and frugal use or exhaustive extraction. Those parts surviving on the site tend to be the most durable, least nourishing, and hardest to process.

Site distribution and taxonomic data generally indicate that FA 2-13 is the remnant of a fall/winter hunting station whose occupants enjoyed limited success and consequently exploited the game acquired to the limit. The processing/consumption pattern most probably reflected at FA 2-13 is one of intensive extraction by roasting the leavings of meat processed for storage on heated rocks. The roasted bone bits were then probably crushed for direct consumption of fat, marrow, blood, meat, and cancellous tissue.

FA 2-13 bone, where burned, shows evidence of in-flesh or fresh-bone roasting (see Binford 1972). The rare examples of dry-bone roasting probably represent unintentional inclusion of debris from previous occupations in later fires. Unburned bone is common enough to suggest that much of the unburned bone discarded on the site survived and was recovered.

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Appendix 10-1 • Animals Recognized

Mammalia: Rodentia

Sciuridae

<u>Cynomys</u>, sp. indet. Prairie Dog

Geomyidae

<u>Thomomys</u>, sp. indet. Pocket Gopher

Heteromyidae

<u>Perognathus</u>, sp. indet. Pocket Mouse
<u>Dipodomys</u> <u>spectabilis</u>, Banner Tail Kangaroo Rat

Cricetidae

<u>Neotoma</u>, sp. indet. Woodrat

Mammalia: Lagomorpha

Leporidae

<u>Lepus</u> ref. <u>californicus</u> Blacktail Jackrabbit
<u>Sylvilagus</u> ref. <u>auduboni</u> Desert Cottontail

Mammalia: Artiodactyla

Cervidae

<u>Odocoileus</u> <u>hemionus</u> Muledeer

Chapter 11 • Faunal Remains From FA 1-6, 3-3, and 3-6

Nancy J. Akins

Methodology

The identification of these faunal remains was completed on a site-by-site basis and by the numerical sequence of the FS number (Appendix 11-1). The comparative collection put together by myself at the National Park Service Albuquerque Office was primarily used. Those specimens not represented in that collection were taken to the Museum of Southwestern Biology, University of New Mexico, for further comparison. Dr. John Applegarth (zoological consultant) identified the two reptile elements.

No identification was made without comparison to a known specimen. If an identification is not certain, generally because the element was fragmentary, a "cf" is used. This means that the identification is most likely correct but not absolutely positive. When an exact identification was not possible an indication of the size of the animal is given (thus the notation "so" stands for "size of"). This indication is based on the thickness of the bone and the curvature of the element. A question mark beside a body part means an uncertain identification — especially if it follows another notation. A question mark after a side identification means that the identification is likely but not absolutely certain.

Two pieces of a single element were treated as two pieces when the break was an old one. Recent breaks were counted as one element and the number of fragments put in parentheses.

The term "long bone" was used to describe any elongated and generally hollow bone. This would include any of the limb bones, phalanges, and metapodials. Flat bones are portions of the skull, most of the pelvis, the scapula, and any broad, flat element that is not hollow-shafted.

Standard procedures were used to calculate the MNI or minimum number of individuals represented (cf. Chaplin 1971). This was done on a site basis for all but FA 3-3, which had a large number of elements and which was multicomponent. Elements that may be of recent origin were treated separately. The most numerous individual element from the same side of the body was used to calculate the largest number of individuals of that taxon that could be represented. Even in site FA 3-3 there was only one taxon that had more than one individual represented within a unit.

Besides the taxon, element (body part), side, and fragmentation of an element (bone), several other observations were recorded. "Burning" means complete burning unless otherwise noted. The color of the burn is also given. Specimens that are most likely of modern origin are pointed out, and MNIs for these calculated separately. Bone that is most likely modern in origin appeared as either sun-bleached and checked (surface cracked), white and possibly greasy, or even with some flesh still adhering. Evidence of use — such as rounded edged or polish — has also been noted, as well as anything that may be the result of butchering practices.

Taxa Recovered

The following taxa were recorded for the three Farmington sites. These, as well as the more indeterminate categories, will be discussed.

Mammals:

Leporidae	
Sylvilagus sp.	cottontail rabbit
Lepus californicus	black-tailed jackrabbit
Sciuridae	
Cynomys gunnisoni or	Gunnison's prairie dog
Spermophilus variegatus	rock squirrel
Geomyidae	
Thomomys bottae	Botta's pocket gopher
Heteromyidae	
Dipodomys ordii	Ord's kangaroo rat
Felidae	
Felis rufus	bobcat
Cervidae	
Odocoileus hemionus	mule deer

Birds:

AVES	bird

Reptiles:

Iguanidae	
Crotaphytus collaris	collared lizard
Colubridae	
Pituophis melanoleucus	bull or gopher snake

Sylvilagus sp.: S. auduboni (the desert cottontail) is the species of Sylvilagus most likely represented in the collection. It is the one found in the area today (Findley et al. 1975). S. nuttalli (Nuttall's cottontail) has been found in San Juan county but prefers riparian situations (ibid.). Species identification for Sylvilagus is difficult. Comparison of the depth of the lower jaw to the alveolar length of the cheek tooth-row can be used to separate S. auduboni from the other two found in the state if an adequate sample of mandibles and comparative specimens are available for the area. No complete mandibles from this taxon were recovered from these sites.

Sylvilagus sp. had more elements than any other taxon. The large number of burned elements attests to its use as a food item. Burning may also contribute to the apparent bias in the distribution of body parts. These are largely limb and foot elements that are small but readily identifiable. When burned they may have been less liable to destruction than larger unburned elements.

L. californicus: This is the only species of jackrabbit found in the study area today (Findley et al. 1975). It is the second most abundant taxon and it, too, was burned often enough to suggest utilization as a food source. Again, the body part distribution is biased in favor of limb and foot elements, and probably for the reasons noted.

Lagomorph: This designation was used for a single skull fragment that was too small for further identification.

C. gunnisoni or S. variegatus: Both of these species would have been available within the study area. The two are extremely difficult, if not impossible, to differentiate except by the dentition. S. variegatus especially likes broken terraces and rocky areas for cover, while C. gunnisoni prefers grasslands (Findley et al. 1975). Both of these are large enough to be a worthwhile food source. One of the elements was scorched, suggesting that the recovered pieces are archeological.

T. bottae: Pocket gophers are valley dwellers which prefer sandy soils (Bailey 1931). In this case the single element could represent either a post-occupational intrusive or part of the archeological record. The element was a maxillary incisor, which has a distinctive cross-section. The small size of this rodent makes it unlikely that it was purposely sought as a food item. On the other hand, pocket gophers are agricultural pests and may have been trapped in that context.

D. ordii: Kangaroo rats of this species are one of the most common and widespread desert rodents in New Mexico (Findley et al. 1975). They are partial to friable soils — such as those found in archeological sites. Again, the small size of this rodent suggests that it was not actively pursued as a food source. Given the habitat preference, the recovered element could represent a postoccupational burrower.

F. rufus: Bobcats are found in almost all habitats in the state but are most common in rocky country (Findley at al. 1975). The two elements representing this species were sunbleached and eroded, which may suggest a recent origin. This species is trapped north of Farmington and it is possible that these two foot elements may have been recent discards from that activity. It is not likely that the elements survived from prehistoric times.

O. hemionus: Mule deer are present in this portion of the state and are assumed to be the species represented by this antler fragment. Because antlers are shed annually and may have been collected for tool use, this presence does not necessarily imply that any more of the individual was present. For this reason an MNI was not calculated for this specimen.

AVES: The only evidence of bird found in the sites was egg shell pieces from FA 1-6. These were white and undiagnostic. They could suggest the presence of turkey at the site or they could be modern intrusives.

C. collaris: The collared lizard represented by a scapula was a mature individual with a snout-vent length of 9 cm. (J. Applegarth, personal communication). This species is partial to bare ground in rocky areas where some grass is present. Jones (1970) noted that in order to collect this species it was necessary to shoot them (due to their ability to run at high speed). This makes it unlikely that it was commonly used as a food source.

P. melanoleucus: Gopher snakes are wide-ranging but prefer grassy habitats. The individual, represented by a single pre-caudal vertebra, was a juvenile with a snout-vent length of 50 cm. (J. Applegarth, personal communication).

Either of the reptiles could be found near the site where they were recovered and could have entered the archeological record by natural means.

The unknown elements were broken down as far as possible with an indication of the size of the creature given when possible. Those that may require some further explanation follow.

Rodent: This term was used for very small rodents, generally smaller than a Neotoma or woodrat. Many of the species that may be represented are small burrowers. The single element assigned this identification was burned and may have been eaten.

Small Mammal: Small mammals are considered to be jackrabbit-size or smaller. These are identified on the basis of cortex thickness and bone curvature. Problems arise mainly with parts such as vertebra fragments and foot elements from the small carnivores. Since the latter occur infrequently in archeological collections, rabbits are generally the most likely small mammal to be represented. Bird elements are often of similar size but do not have as thick a cortex with respect to bone curvature. With very small fragments it is impossible to distinguish between small mammals and birds.

Medium to Large Mammal: This group includes animals larger than a jackrabbit and up to an artiodactyl in size. The elements have sufficiently thick cortex that they could belong to any of several animals.

Large Mammal and Large Mammal/artiodactyl: Most of the elements placed in this category are probably from artiodactyls. A thick cortex and curvature indicate that a large mammal is represented. Other than the artiodactyls, large mammals (such as bear) are seldom found in archeological assemblages. Human bones, while large, are usually distinctive in texture and can often be differentiated.

Artiodactyl: The three artiodactyls most likely to be represented in the collection are Odocoileus hemionus, which would have been readily available, Antilocapra americana (pronghorn) which could be found nearby, and possibly Ovis canadensis (mountain sheep).

Mammal: This term was used for tiny fragments, usually only the bone surface, that were hard even to put into a gross size category. The "unknown" label suggests that bird is a possibility, or, if followed by a question mark, it may not even be bone.

The Sites

FA 1-6

FA 1-6 is an Anasazi hearth and midden area with a pitstructure. The pitstructure was in use during Basketmaker III, while later use of the site extended to 1150 or 1300 A.D. (Raish, this volume). Eleven pieces of bone and approximately 47 pieces of egg shell were analyzed from this site. Table 11-1 presents the element counts and percentages, and the MNI calculations. These have been divided into two groups. Bones in the first group are suggested as intrusive because of their sun-bleached appearance and heavy checking, or greasy surfaces. This leaves only three possible archeological bones in the sample; one of these was a pocket gopher and may also be intrusive. The single C. gunnisoni or S. variegatus vertebra is scorched, which suggests prehistoric use.

Remains from small mammals are not likely to survive for long on the ground surface. A study by Behrensmeyer (1978) of very large mammal (larger than 5 kg. in body weight) elements left exposed on the surface suggests that even these would be falling apart in as few as 6 years. The greatest bone weathering occurred in the zone immediately above the soil. This may be enhanced

Table 11-1. Number of Elements, Percent of Elements, and MNI for FA 1-6.

Taxon	Recent? No.	Recent? Percent	Recent? MNI	Archeological No.	Archeological Percent	Archeological MNI	Site Totals No.	Site Totals Percent	Site Totals MNI
Sylvilagus sp.	3	37.5	1				3	27.3	1
C.gunnisoni or *S. Variegatus*				2	66.7	1	2	18.2	1
T. bottae				1	33.3	1	1	9.1	1
F. rufus	2	25.0	1				2	18.2	1
Medium to large mammal	1	12.5					1	9.1	
Artiodactyl	1	12.5	1				1	9.1	1
Large mammal/artiodactyl	1	12.5					1	9.1	
Total Bone	8		3	3		2	11		5
Percent of Site Total		72.7			27.3				
AVES egg shell							@47		

by fluctuating temperatures and humidity. Given the short life of even these large elements, those from small mammals might not last long at all. Archeological bone is usually a tan or beige color, and it is unlikely that a once-buried bone brought to the surface would bleach to a white color. It would erode but might still retain the tan coloration.

Given that the excavations were relatively shallow and little bone was recovered, it is quite likely that preservation was a problem at this site. The near absence of burned bone may suggest that preparation and discarding of food items took place away from the main site, that the occupation of the site was short-lived, that little fresh meat was eaten at that site, or that the site function did not include meat procurement and processing.

FA 3-3

FA 3-3 (sec. 17, T. 30 N., R. 12 W.) had the largest number of bones analyzed (n=233). It is a multi-component site including a pithouse, an ash and fire-cracked rock midden, three roasting pits, three cobble-ring hearths, and four hearths with no associated cobbles. The features were scattered throughout an area of 160 by 550 m., and may not all be associated. The site shows two major periods of occupation: Basketmaker II and early Pueblo II (Raish, this volume).

Because of the size and complexity of the site it was divided into a number of proveniences for analysis (Raish, this volume). These were used in Tables 11-2 and 11-4 to present the number of elements, calculate the MNIs, and give a breakdown of burning percentages. The proveniences are as follows.

Locus 4 — a stained area containing some burned material

Stratum 2 (upper occupation lense) FS 473

Stratum 1 (lower occupation lens) FS 311, 433, 443 (not included in counts), 446, 447, 451, 461, 512, 580, 581, 609

Unit 50, Level 1 FS 313

Profile cut (deeper than the others) FS 584

Feature 3 (slab-lined roasting pit) FS 276

Feature 11 (hearth) FS 284, 355

Test Pit (Unit 103) FS 613

Locus 5

Associated with a cobble ring hearth FS 197

Feature 13, Level 1 (living surface) FS 705, 713, 720, 721, 724, 725, 727, 728, 730, 733, 739, 742, 743, 744, 745, 753

Augur Test, FS 712

Locus 6

Feature 5 (cobble-ring hearth) FS 197

Feature 6 (ash and fire-cracked rock midden) FS 254, 262, 459, 483, 487, 524, 527, 589, 591, 594

Feature 7 (cobble-filled roasting pit) FS 491, 497

Feature 13 (pithouse) FS 536, 541, 585, 600, 618, 672, 680

Table 11-2 gives the element counts and percentages, and the MNI calculations for each provenience. The table indicates that rabbits were a component of the diet, and although parts of as many as six artiodactyls or other large mammals are suggested, these may represent a single animal spread throughout the site. Estimates of the contribution of various taxa to the diet for such a small sample would not be meaningful, especially when preservation is considered.

Table 11-3 gives the body part distribution for each taxon with many of the bones of indeterminate species lumped into general categories. While an apparent bias in favor of foot elements and long bone fragments is evident, this is more likely the result of preservation than discards, meat packages, or site function. These elements are more apt to be preserved, especially when they are burned.

Table 11-4 looks at the amount of heat alteration by taxon using the provenience breakdown in Table 11-2. The amount of burning is quite high. At Pueblo Alto in Chaco Canyon (Atkins 1982) the amount of burned bone found in fire pits was 46.5 percent, and that in trash-filled structures only 6.0 percent. Nearly all of the provenience groupings from this site and the site total exceed that amount. While this makes sense in the context of the hearth features found at the site, it also suggests that many of the remains recovered were preserved by burning.

Several elements from Locus 6, Feature 7 and one from Locus 5, Grid 115 were covered with a white encrustation, possibly calcium from water percolation. The elements from the former locus included two Sylvilagus elements and a snake vertebra, and those from the latter an O. hemionus phalanx. None of these was burned. Placement in shallow fill above bedrock may have resulted in the encrustation. The fact that none of the bones was burned may also suggest that they were deposited later than the other elements found in these features.

The only immature element recorded was from an unknown small mammal. This is not sufficient to suggest any season of occupation.

Given the small sample size and the possibility of a bias in what was preserved, it is difficult to make any conclusive statements about faunal resource utilization at the site. We can say that both rabbit species and deer were exploited, but their relative contributions are unknown.

FA 3-6

FA 3-6 (Section 17 T. 29 N., R. 12 W.) consisted of a lithic scatter with some ceramics, fire-cracked rock, and an ash scatter. The major use of the site was between Basketmaker III and Pueblo II (Raish, this volume). A total of 41 archeological elements and one possible recent Sylvilagus sp. femur fragment were identified from this site. The archeological materials were all very small burned fragments.

On the advice of the site excavator the entire sample, with the exception of the Sylvilagus element, was treated as a unit. The identifications were broken down as far as possible to determine the range of animals that were represented in the collection. These seem to indicate that both species of rabbit were present, as well as at least one medium-to-large artiodactyl or other mammal (Table 11-5).

The fact that all of the bone is burned again suggests that the burning contributed to the preservation of those elements recovered. Data in Table 11-6 supports this idea in that the elements preserved are mostly long bone shaft fragments.

Observations

Evidence of butchering or processing, other than burning, was uncommon in the collection. Pieces with such evidence will be described individually. Nonformal tools or sharp fragments of bone with polish on the edges are hard to distinguish from the results of burchering or processing activities. Several of the elements listed below may have been modified for use rather than being the result of butchering or purposeful breakage.

FA 1-6, FS 142-1, consists of a fragment of a ramus and mandibular condyle. It is an artiodactyl (deer-sized) but is sun-bleached and checked, suggesting that it may be recent. There is a possible cut that would have removed the coronoid process, possibly to detach the mandible. The cut is straight and angled, suggesting a butchering mark, but it is also quite eroded.

FA 1-6, FS 285, is a small portion of a long bone shaft that is similar in size to an artiodactyl metacarpal shaft. One end is beveled and polished. This is probably a modification for use, although no grinding is apparent.

FA 3-3, FS 197-4, is an unusual piece of bone, possibly a cortex fragment from the end of a long bone. It is partially burned and eroded. One end has what is either a sharp cut or a smooth spiral break. The edge cut is also slightly polished, suggesting that it may have been utilized.

FA 3-3, FS 447, is a fragment of large mammal long bone, probably an artiodactyl tibia or femur shaft. It has two spiral-like breaks. While these may have resulted from breakage for marrow, they also gave it a diamond shape with two pointed edges. Polish on most of the margin may indicate that it was used.

FA 3-3, FS 451-4, is another large mammal long bone shaft fragment. The element is eroded but does have a spiral fracture on one edge. Like FS 447-1, the pointed edge is rounded and may have been utilized.

One formal bone tool was found in the collection: FA 3-3, FS 541-4. It appears to have been made from a portion of a deer sized artiodactyl metatarsal fragment. Unfortunately it is broken, eroded, and burned. One end is sharpened but no wear is visible.

Comments

It is generally accepted (Grayson 1978) that few statistical comparisons can be made with sample sizes of under one hundred. This is especially true when large numbers of elements are not identifiable. No quantative analyses were attempted for these sites.

Several factors must be considered in the evaluation of even small versus large mammal utilization. A large mammal such as an artiodactyl provides much more meat than does a rabbit. It takes about 73 cottontails or 25 jackrabbits to equal the amount of usable meat of one deer. Rabbits are more numerous, can be trapped, and have a propensity to increase in number around agricultural plots (Bailey 1931). This makes them a readily available and attractive prey. However, when a sample is small, such as this one, and preservation is suspected to be a problem, there is very little that can be said about faunal procurement strategies. Rabbits and large mammals were utilized, but estimates of the proportions these contributed to the diet would not be accurate given these two problems.

Table 11-2. Number of Elements, Percent of Elements, and MNI for FA 3-3.

	Locus 4																	
	Stratum 1			Stratum 2			Unit 50 Level 1			Profile Cut			Feature 3			Feature 11		
Taxon	**No.**	**%**	**MNI**	**No.**	**%**	**MNI**	**No.**	**%**	**MNI**	**No.**	**%**	**MNI**	**No.**	**%**	**MNI**	**No.**	**%**	**MNI**
Sylvilagus sp.	4	6.7	1							1	100.0	1						
L.californicus																1	25.0	1
Lagomorph																		
D. Ordii	2	3.3	1															
O. Hemionus																		
C. Collaris	1	1.7	1															
P. melanoleucus																		
Rodent																		
Small Mam./Bird	8	13.3																
Small Mammal	1	1.7																
s.o. *Neot-Sylv.*													1	50.0				
s.o. *Neot-Lepus*	1	1.7																
s.o. *Sylvilagus*	4	6.7																
s.o. smaller than *Sylvilagus*																		
s.o *Sylv-Lepus*																		
s.o *Lepus*	4	6.7	1															
s.o *Lepus* +																		
Small-med. Mammal													1	50.0	1			
Med. Mammal/bird																		
Med-lg. Mammal	11	18.3		1	100.0	1										2	50.0	1
Large Mammal	16	26.7					1	100.0	1									
Lg. Mam./artio.	1	1.7																
Artiodactyl	3	5.0	1															
Mammal	3	5.0																
Unknown	1	1.7														1	25.0	
Aves																		
Totals	60		5	1		1	1		1	1		1	2		1	4		2
Site percent total		25.7			.4			.4			.4			.8			1.7	

Locus 4			Locus 5									Locus 6					
Grid 103			Cobble Hearth			Living Surface			Augar Test			Feature 5			Feature 6		
No.	%	MNI	No.	%	MNI	No.	%	MNI	No.	%	MNI	No.	%	MNI	No.	%	MNI
															17	14.3	3
												1	14.3	1	6	12.2	1
												1	14.3				
						2	3.5	1				1	14.3	*			
															1	2.0	1
						1	1.7										
						1	1.7	1							5	10.2	
															13	26.5	
															4	8.2	
															1	2.0	
															1	2.0	
						2	3.5								1	2.0	
			6	85.7	1	39	68.4		1	100.0	1	4	57.1	1			
						2	3.5										
						6	10.5	1									
			1	14.3		4	7.0										
1	100.0	1															
1		1	7		1	57		3	1		1	7		2	49		5
	.4			3.0			24.5			.4			3.0			21.0	

Table 11-2. Number of Elements, Percent of Elements, and MNI for FA 3-3 (continued).

	Locus 6						Site Totals			
	Feature 7			Feature 13			Elements		MNI	
Taxon	No.	%	MNI	No.	%	MNI	No.	%	No.	%
Sylvilagus sp.	7	34.7	3				29	17.6	6	19.3
L. californicus							8	3.4	3	9.7
Lagomorph							1	.4		
D. ordii							2	.9	1	3.2
O. hemionus				2	7.8	1	5	2.1	2	6.4
C. collaris							1	.4	1	3.2
P. melanoleucus	1	6.2	1				1	.4	1	3.2
Rodent							1	.4	1	3.2
Small mam./bird				1	3.8	1	10	4.3	1	3.2
Small mammal							7	3.0	1	3.2
s.o. *Neot-Sylv.*							1	.4		
s.o. *Neot-Lepus*							1	.4		
s.o. *Sylvilagus*							17	7.3		
s.o. smaller than *Sylvilagus*							4	1.7		
s.o. *Sylv.* to *Lepus*	6	37.5					7	4.2		
s.o. *Lepus*				1	3.8		5	2.1	1	3.2
s.o. *Lepus* +							1	.4		
Small-med. mammal							4	1.7	1	3.2
Med. mammal/bird				3	11.5	1	3	1.8	1	3.2
Med-lg. mammal	2	12.5	1	2	7.8		68	29.2	6	19.3
Large mammal				1	3.8		20	8.6	1	3.2
Lg. mam./artio.				14	53.8		21	9.0	1	3.2
Artiodactyl				2	7.8	1	5	2.1	2	6.4
Mammal							8	3.4		
Unknown							2	.9		
Aves							1	.4	1	3.2
Totals	16		3	26		4	233		31	
Site Percent total		6.9			11.1					

*antler

Table 11-3. Body Part Percentages of Occurrence at FA 3-3.

Taxon	Skull	Verts/ Ribs	Front Leg	Hind Leg	Feet	Long Bone	Flat Bone	Unknown	Sample Size
Sylvilagus sp.	3.4		24.1	17.2	55.2				29
L.Californicus			12.5		87.5				8
Lagomorph	100.0								1
Rodent	33.3		33.3		33.3				3
O.hemionus	60.0				40.0				5
Reptiles		50.0	50.0						2
Small mammals		2.4				82.5	2.4	11.9	42
Sm. mamm/bird						90.0	10.0		10
Sm-med. mamm.						40.0	60.0		5
Med. mamm/bird						100.0			3
Med-lg. mamm.	5.9	1.5				44.1	2.9	45.6	68
Lg. mamm/artio.	4.3			2.2	2.2	80.4	2.2	2.2	46
Mammal						62.5	37.5		8
Aves		100.0							1
Unknown							50.0	50.0	2

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Table 11-4. Percentages of Heat-Altered Bone by Taxon and by Provenience Unit.

	Locus 4											
	Stratum 1		Stratum 2		Unit 50 Level 1		Profile Cut		Feature 3		Feature 11	
Taxon	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Sylvilagus sp.	1	25.0										
L. californicus											1	100.0
Lagomorph												
D. ordii												
O. hemionus												
C. collaris												
P. melanoleucus												
Rodent												
Small mammal/bird	8	100.0										
Small mammal												
s.o. *Neot-sylv.*												
s.o. *Neot-Lepus*												
s.o. *Sylvilagus*												
s.o. smaller than *Sylvilagus*												
s.o. *Sylv-Lepus*												
s.o. *Lepus*	1	25.0										
s.o. *Lepus* +												
Small-med. mammal												
Med. mammal/bird												
Med-lrg. mammal	10	90.9	1	100.0							2	100.0
Large mammal	11	68.7			1	100.0						
Lrg. mamm/artio.												
Artiodactyl	1	33.3										
Mammal												
Aves												
Unknown	1	100.0									1	100.0
Total Burned	33	55.0	1	100.0	1	100.0	0	0.0	0	0.0	4	100.0

Locus 4		Locus 5						Locus 6			
Grid 103		Cobble Hearth		Living Surface		Augar Test		Feature 5		Feature 6	
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
										12	70.6
								1	100.0	5	83.3
								1	100.0		
				1	50.0			1	100.0		
										1	100.0
				1	100.0						
				1	100.0					5	100.0
										5	38.5
										4	100.0
										1	100.0
				2	100.0						
		6	100.0	39	100.0	1	100.0	3	75.0		
				2	100.0						
				6	100.0						
		1	100.0	4	100.0						
1	100.0										
1	100.0	7	100.0	56	98.2	1	100.0	6	85.7	33	67.3

Table 11-4. Percentages of Heat-Altered Bone by Taxon and by Provenience Unit (continued).

	Locus 6				Site Totals			
	Feature 7		Feature 13				Percent	
	No.	%	No.	%	No.	%	Burned	Scorched
Sylvilagus sp.	4	57.1			17	58.6	55.1	3.4
L.californicus					7	87.5	50.0	37.5
Lagomorph					1	100.0	100.0	
D. Ordii					0	0.0		
O. Hemionus			2	100.0	4	80.0	80.0	
C. Collaris					0	0.0		
P. melanoleucus					0	0.0		
Rodent					1	100.0	100.0	
Small mammal/bird			1	100.0	10	100.0	100.0	
Small mammal					6	85.7	85.7	
s.o. *Neot-sylv.*					0	0.0		
s.o. *Neot-Lepus*					0	0.0		
s.o. *Sylvilagus*					5	29.4	29.4	
s.o. smaller than *Sylvilagus*					4	100.0	100.0	
s.o. *Syl.-Lepus*	2	33.3			2	28.6	28.6	
s.o. *Lepus*			1	100.0	2	40.0	40.0	
s.o. *Lepus* +					1	100.0	100.0	
Small-med. mammal					2	50.0	50.0	
Med. mammal/bird					0	0.0		
Med-lrg. mammal	2	100.0			64	94.0	94.0	
Large mammal			1	100.0	15	75.0	75.0	
Lrg. Mam./artio.			2	14.3	8	38.1	38.1	
Artiodactyl			2	100.0	3	60.0	60.0	
Mammal					5	62.5	62.5	
Aves					1	100.0		
Unknown					2	100.0		
Total Burned	8	50.0	9	34.6	160	68.7	66.9	1.7

Table 11-5. Number of Elements, Percent of Elements, and MNI for FA 3-6.

Taxon	Recent?			Archeological			Site Totals		
	No.	Percent	MNI	No.	Percent	MNI	No.	Percent	MNI
Sylvilagus sp.	1	100.0	1				1	2.3	1
Small mammal or bird				2	4.8		2	4.6	
s.o. *Sylv.* or smaller				3	7.1	1	3	7.0	1
s.o. *Neotoma* to *Lepus*				7	16.7		7	16.3	
s.o. *Lepus*				2	4.8		2	4.6	
s.o. *Lepus* or larger				3	7.1	1	3	7.0	1
Small to medium mammal				5	11.9		5	11.6	
Medium to large mammal				17	40.5		17	39.5	
Large mammal				1	2.4	1	1	2.3	1
Mammal				2	4.8		2	4.6	
Total Bone	1		1	42		3?	43		4?

Table 11-6. Body Part Percentages of Occurrence at FA 3-6.

Taxon	Skull	Verts/ Ribs	Hind Leg	Feet	Long Bone	Flat Bone	Unknown	Sample Size
Sylvilagus sp.			100.0					1
Small mammal					85.7		14.3	14
Sm-med. mammal	12.5	12.5			62.5	12.5		8
Med-lrg. mammal		5.9			70.6	5.9	17.6	17
Large mammal					100.0			1
Mammal					50.0	50.0		2

Appendix 11-1 • Faunal Remains From FA 1-6, 3-3, and 3-6.

FA 1-6

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 131 A	101N 109E Level 1				
1	AVES	egg shell	35 fragments		white, also includes 3 pinyon shells
FS 134 A	101N 109E Level 2				
1	AVES	egg shell	12 fragments		white
FS 142	195° 100m. 0-10cms.				
1	artiodactyl sp. s.o. A. americana or O. hemionus but could be a large domestic sheep or goat	mandible	condyle	right	white: sun bleached and very eroded—possibly recent; coronoid process may have been cut off, beveled
2	med. to lg. mammal	flat bone	chip—possibly part of a skull or scapula		white: sun bleached and very eroded—possibly recent
3	bone ?				probably not bone
FS 144	100N 106E west half				
1	Sylvilagus sp.	skull	cranial base		modern—white and greasy
2	Sylvilagus sp.	atlas vertebra	about half		modern—white and greasy
3	Sylvilagus sp.	axis vertebra	superior portion only		modern—white and greasy all three elements were articulated
FS 145	100N 106 E Level 2 not bone				
FS 169	90° 4 m. Level 0-25 cm.				
1	Felis rufus (bobcat)	astragalus	complete	left	white: sun bleached and eroded—possibly recent
2	Felis rufus	navicular	complete	left	same as above
FS 173	101.5N 104.5E Level 2				
1	Cynomys gunnisoni or Spermophilus variegatus (prairie dog or rock squirrel)	atlas vertebra	complete		slightly scorched—brown
2	same as above	humerus	shaft	right	
FS 285	200N 205E Unit 57 Surface to bedrock.				
1	lg. mammal artiodactyl	long bone	shaft fragment		one end crudely beveled/ probably cut and polished moderately eroded
FS 392	Feature 4 East half Level 2				
1	Thomomys bottae (pocket gopher)	skull	maxillary incisor	right	

FA 3-3

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 197	Locus 6 137N 108E Hearth				
1	Odocoileus hemionus (mule deer)	skull	antler—end fragment		burned: white/gray
2	Lepus californicus jackrabbit	radius	shaft fragment	left	burned: white
3	Lagomorph; Lepus or Sylvilagus	skull	parietal? fragment		burned: black/gray
4	medium to large mammal	unknown	fragment		checked; one edge probably cut diagonally with slight polish on edge; partial burn: gray
5	same as above	unknown	fragment		burned: white
6,7	same as above	skull (?)	fragments		burned: gray
FS 254	Locus 6 136N 107E Level 3 Grid 34				
1	small to medium mammal, s.o. Lepus or larger	long bone	shaft fragment (4 pieces)		possibly a Lepus femur frag. burned: white
FS 262	Locus 6 135N 107E Level 4 Grid 37				
1	small mammal	long bone	shaft fragment (2 pieces)		burned: gray
FS 276	Locus 4 125.5N 86E Level 1 Grid 49				
1	small to medium mammal	flat bone	fragment (2 pieces)		possibly a Lagomorph skull frag. white—sun bleached & checked; possibly recent
2	small mammal s.o. Neotoma to Sylvilagus	rib or lumbar spine	distal end		white—possibly recent
FS 284	Locus 4 125N 86E Level 1 Grid 60				
1	unknown		fragment (3 pieces)		moderate checking burned: white
FS 311	Locus 4 127N 86E Stratum 1 Grid 37				
1	medium to large mammal	unknown	fragment (3 pieces)		burned: gray
2	same as above (also includes 2 fragments of mineral (?)	long bone	shaft fragment (2 pieces)		burned: white and gray
FS 313	Locus 4 127.50N 86E level 1 Grid 50				
1	large mammal	long bone	shaft fragment		burned: gray
FS 355	Locus 4 125.50N 86E Stratum 2 Grid 49				
1	Lepus californicus	phalanx 2	distal end		burned: gray
2	medium to large mammal	long bone	shaft fragment		burned: gray

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
3	same as above	unknown	fragment		burned: gray
FS 379	Locus 5 128N 94E Level 1 Grid 41				
1,2	medium to large mammal	unknown	fragments		burned: white and white/gray
3	same as above	flat bone	fragment		burned: white
FS 381	Locus 5 129N 94E Level 1 Grid 42				
1,2	medium to large mammal	long bone	shaft fragments		burned: 1 white, 1 gray
3	same as above	unknown	very small fragment		burned: white
4	mammal	long bone	cortext ? fragment		burned: gray
FS 433	Locus 4 126N 56E Stratum 1 Grid 28				
1	Sylvilagus sp. (cottontail rabbit)	phalanx 1 hind foot	complete		
2	Sylvilagus sp.	phalanx 2 hind foot	complete		
3	Sylvilagus sp.	femur	shaft fragment (2 pieces)		
4	Dipodomys ordii (kangaroo rat)	humerus	distal and shaft	right	
5	Crotaphytus collaris (collared lizard)	scapula	mostly complete	left (?)	
6,7	artiodactyl sp.	skull	tooth enamel fragments (2 pieces)		
8-11	small mammal s.o. Sylvilagus	long bone	shaft fragments		possibly portions of #3
12-14	mammal	long bone	shaft fragments		
15-21	small mammal or bird	long bone	shaft fragments		burned: gray
22-29	large mammal	long bone	shaft fragments		burned: gray
30	small mammal, s.o. Neotoma to Lepus	unknown	end fragment		immature
FS 443	Locus 4 125.50N 56E Stratum 1 Grid 49				
1	bone ????	flat chip			
FS 446	Locus 4 125.47N 87.56E Stratum 1 Grid 60				
1	large mammal	long bone	shaft fragment		

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 447	Locus 4 125.35N 87.20E Stratum 1 Grid 60				
1	large mammal	long bone femur?	shaft fragment		2 spiral breaks, polish
2	large mammal	long or flat bone	chip		
FS 451	Locus 4 125N 86E Stratum 1 Grid 60				
1	small mammal s.o. Lepus	long bone	shaft fragment		probably a Lepus metatarsal burned: gray
2,3	large mammal	long bone	shaft fragments		burned: gray
4,5	large mammal	long bone	shaft fragments		1 with spiral break, polish
6	medium to large mammal	long bone	shaft fragment		
7	same as above	long bone	shaft fragment		burned: white
8-10	small mammal s.o. Lepus	long bone	shaft fragments		
11	medium to large mammal	long bone	shaft fragment		burned: gray
12	same as above	flat bone	fragment		burned: gray
13	small mammal		flat bone		fragment
FS 459	Locus 6 134N 104E Level 1 Grid 76				
1	Sylvilagus sp.	phalanx 1	proximal and shaft		burned: gray
2	Sylvilagus sp.	phalanx 1	distal and shaft		burned: gray
3	Sylvilagus sp.	mandible	small fragment of body with one tooth in place		
FS 461	Locus 4 126.5N 86E Stratum 1 Grid 36				
1-3	medium to large mammal	long bone	shaft fragments		burned: gray
4	small mam. or bird s.o. Sylvilagus to Lepus	long bone	shaft fragment		burned: gray
5	medium to large mammal	long bone	shaft fragment		burned: gray
6	unknown	flat bone	fragment		burned: white
FS 473	Locus 4 124.5N 86E Level 1 Stratum 2 Grid 87				
1	medium to large mammal	? skull	fragment		burned: white & gray

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 483	Locus 4 135N 104E Level 1 (feature) Grid 74				
1	Sylvilagus sp.	calcaneum	fragment	right	burned: white
2	Lepus californicus	tarsal	mostly complete	right	burned: gray
3	Lepus californicus	phalanx 1	proximal and shaft		partially burned: black & scorched brown
4	c.f. Lepus californicus	metatarsal	4 shaft		scorched brown
5	Lepus californicus	phalanx 2	complete		slightly scorched
FS 487	Locus 6 136N 50E Level 2 Grid 61				
1	Lepus californicus	metatarsal	distal & 1/3 of shaft		scorched brown
FS 491	Locus 6 137N 104E Level 2 Grid 70				
1	Sylvilagus sp.	radius	shaft fragment	unknown	
FS 497	Locus 6 136N 104E Level 4 Grid 72				
1	Sylvilagus sp.	radius	proximal & 1/3 of shaft	left	calcium encrusted
2	Sylvilagus sp.	radius	proximal & 1/3 of shaft	right	calcium encrusted
3	Sylvilagus sp.	phalanx 1	proximal and shaft		burned: white/gray
4,5	Sylvilagus sp.	phalanx 2	complete		burned: 1 gray,1 blk
6	Pituophis melanoleucus (bull or gopher snake)	vertebra	complete		calcium encrusted
7	c.f. Sylvilagus sp.	tibia	shaft fragment	right	burned: white
8-11	small mammal s.o. Sylvilagus to Lepus	long bone	shaft fragments		
12,13	same as above	long bone	shaft fragments		burned: white
14,15	medium to large mammal	unknown	small chips		burned: gray
FS 512	Locus 4 123.5N 86E Stratum 1 Grid 89				
1	Sylvilagus sp.	tibia	shaft fragment (2 pieces)	left	burned: gray
FS 524	Locus 6 136N 105E Level 3 Grid 61				
1	Sylvilagus sp.	radius	fragment of prox. and 1/3 of shaft	right	
FS 527	Locus 6 136N 105E Level 1 Grid 61				
1	Sylvilagus sp.	humerus	slightly more than half of the shaft	left	
2	Sylvilagus sp.	metatarsal 3	proximal and 2/3 of the shaft	left	burned: gray

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
3	Sylvilagus sp.	tibia	shaft fragment	right?	
4	Sylvilagus sp.	humerus	shaft fragment	left	not part of #1
5	small to medium mammal. s.o. Lepus to Canis	long bone	shaft portion		
6	small mammal s.o. Sylvilagus to Lepus	long bone	shaft fragment		
7,8	small mammal s.o. Sylvilagus	long bone	shaft fragments		burned: gray
FS 536	Locus 6 130N 103E Level 1 Grid 90				
1	sm. mammal or bird	long bone	shaft fragment		burned: white
2,3	large mammal, probably artiodactyl	long bone	shaft fragments		burned: white
4	artiodactyl	tibia	shaft fragment	right	burned: white
FS 541	Locus 6 133N 103E Level 2 Grid 81				
1-3	medium mammal or large bird	long bone	shaft fragments		probably bird
4	artiodactyl	long bone	shaft fragment (2 pieces)		an awl;pointed at one end surface eroded; no wear visible; burned black
FS 580	Locus 4 122.5N 86E Stratum 1 Grid 91				
1	large mammal probably artiodactyl	long bone	shaft fragment		
FS 581	Locus 4 122.5N 86E Level 1 Grid 91				
1	artiodactyl	metatarsal ?	shaft fragment		burned: gray
FS 584	Locus 4 125N 87.5E Grid 101				
1	Sylvilagus sp.	tibia	shaft fragment near prox. end	right	
FS 585	Structure 6 132N 105E Level 2 Grid 96				
1-12	large mammal probably artiodactyl	long bone	shaft fragments		may be from the same bone. old breaks
FS 589	Locus 6 135N 105E Level 1 Grid 63 Charcoal stain				
1	Sylvilagus sp.	calcaneum	distal end	left	burned: white
2	Sylvilagus sp.	phalanx 1	proximal and shaft		burned: gray
3	Sylvilagus sp.	phalanx 2	complete		burned: gray
4	Sylvilagus sp.	metacarpal 2	proximal & 1/2 shaft	right	burned: gray

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
5	Lepus californicus	metacarpal 3	proximal & 1/2 shaft	right	
6	Sylvilagus sp.	humerus	shaft above distal end	left	burned: gray
7	rodent	phalanx 2	complete		burned: white
8-13	small mammal s.o. Sylvilagus	long bone	shaft fragments		
14	same as above	long bone	shaft/probably a metapodial		burned: black
15,16	same as above	long bone	shaft fragments		burned:1 white 1 gray
17	small mammal	unknown	chip		burned: white
FS 591	Locus 6 135N 105E Level 1 Grid 63 Charcoal stain				
1	Sylvilagus sp.	phalanx 1	hind foot, complete		scorched or "cooking brown"
FS 594	Locus 6 135N 106E Level 1 Grid 62				
1	Sylvilagus sp.	calcaneum	distal and part of the articular surface	right	
2	Sylvilagus sp.	astragalus	mostly complete	right	burned: white
3	small mammal s.o. Sylvilagus	long bone	shaft fragment(7 pieces)		
4	same as above	long bone	shaft fragment(2 pieces)		
5-8	small manmal s.o. Sylvilagus or smaller	long bone	shaft fragments		burned:1 white 3 gray
9-11	small mammal	unknown	chips		burned: gray
FS 600	Feature 13, structure Locus 6 Level 2 Grid 95				
1	cf Odocoileus hemionus	antler	fragment		burned: brown
2	large mammal	long bone	shaft fragment		burned: brown, 2 pieces, fresh break
FS 609	Locus 4, Stratum 1 Grid 102				
1	large mammal	long bone shaft	fragment		burned: black
2	medium to large mammal, possibly O. hemionus	maxilla or mandible	small fragment rooted teeth		burned: gray
3	Dipodomys ordii	mandible	anterior fragment	right	
FS 613	Locus 4 Level 1 Grid 103				
1	c.f. Aves	unknown (sternum)?	small fragment		burned: gray

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 618	Locus 6 Level 1 Grid 104				
1	Aves	egg shell	fragment		
2	medium to large	unknown	fragment		3 pieces fresh break
FS 672	Structure Locus 6 Level 1 Grid 111, surface to roof fall				
1	medium to large mammal	long bone shaft	fragment		polished and rounded
2	small mammal s.o. <u>Lepus</u>	long bone shaft	fragment		burned: white
FS 680	Structure Locus 6 Level 1 Grid 110				
1	<u>Odocoileus</u> <u>hemionus</u>	accessory metatarsal	distal and shaft		burned: brown 2 small cuts perpendicular to the shaft
FS 705	Locus 5 Level 1 Grid 115				
1	<u>Odocoileus</u> <u>hemionus</u>	first phalanx	distal and shaft		calcium encrusted moderate checking
2	large mammal	long bone shaft	fragment		burned: white
3	medium to large mammal	long bone shaft	fragment		burned: white
FS 712	Locus 5, auger test, 56 cm. below surface				
1	med. to lg. mammal	unknown	fragment		burned: white 2 pieces, fresh break
FS 713	possible structure, Locus 5 Level 1 Grid 113				
1-3	large mammal probably artiodactyl	long bone shaft	fragments		burned: white
4-5	large mammal probably artiodactyl	unknown	fragments		burned: 1 white 1 gray
6	large mammal	unknown	fragment		burned: gray
7	mammal	unknown	fragment		burned: gray
8	small mammal	long bone shaft	fragment		burned: gray
9-10	small to med. mammal	flat bone	fragment		burned: gray
11	mammal	unknown	fragment		burned: gray
12	mammal	long bone	fragment		
FS 720	Feature 18, possible structure Locus 5 Level 1 Grid 113				
1	med. to lg. mammal	long bone shaft	fragment		burned: white, powdery 5 pieces, fresh breaks

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 721	Feature 18, possible structure Locus 5 Level 1 Grid 113				
1	med. to lg. mammal	long bone shaft	fragment		burned: white
FS 724	Feature 18, possible structure Locus 5 Level 1 Grid 41				
1	med. to lg. mammal	long bone shaft	fragment		burned: white, powdery
FS 725	Feature 18, possible structure Locus 5 Level 1 Grid 41				
1	med. to lg. mammal	long bone shaft	fragment		burned: white
FS 726	Feature 18, possible structure Locus 5 Level 1 Grid 56				
1	med. to lg. mammal probably artiodactyl	long bone shaft	fragment		burned: white; 6 pieces, fresh breaks
FS 728	Feature 18, possible structure Locus 5 Level 1 Grid 115				
1	small mammal or medium bird	unknown possibly skull	fragment		burned: gray; 2 pieces, fresh break
FS 730	Feature 18, possible structure Locus 5 Level 1 Grid 115				
1	cf <u>Odocoileus</u> <u>hemionus</u>	antler	fragment		burned: gray; 2 pieces, fresh break
FS 733	Feature 18, possible structure Locus 5 Level 1 Grid 115				
1	large mammal	unknown possibly skull or pelvis	fragment		burned: white; 9 pieces, fresh breaks
FS 739	Feature 18, possible structure Locus 5 Level 1 Grid 115				
1-2	med. to lg. mammal	long bone shaft	fragments		burned: white
3-10	med. to lg. mammal	unknown	fragments		burned: white
11	med. to lg. mammal	cancellous bone	fragment		burned: gray
12-18	med. to lg. mammal	unknown	fragments		burned: gray
FS 742	Feature 18, possible structure Locus 5, Level 1 Grid 114				
1	med. to lg. mammal	long bone shaft	fragment		burned: white
FS 743	Feature 18, possible structure Locus 5 Level 1 Grid 114				
	pieces of FS 742, fresh break				
FS 744	Feature 18, possible structure Locus 5 Level 1 Grid 114				
1	mammal	unknown	fragment		burned: white
FS 745	Feature 18, possible structure Locus 5 Level 1 Grid 114				
1	med. to lg. mammal	long bone shaft	fragment		burned: white powdery
FS 748	Feature 18, possible structure Locus 5 Level 1 Grid 114				
1	med. to lg. mammal possibly artiodacytl	long bone shaft	fragment		burned: white

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 750	Feature 18, possible structure Locus 5 Level 1 Grid 114				
1-2	med. to large mammal	long bone end	fragment, cancelous bone		burned: gray
3-4	med. to large mammal	long bone shaft	fragment		burned:1 gray,1 brown 2 pieces,fresh break
5	med. to large mammal	unknown	fragment		burned: gray
FS 753	Feature 12, ash pit Locus 5 Level 1 Grid 42				
1-3	med. to large mammal	long bone	fragments		burned: white
4	med. to large mammal	rib shaft	fragment		burned: white
5-7	med. to large mammal	unknown	fragments		burned: white
FS 72	3.04S 14.0E Surface				
1	small mammal s.o. Neotoma to Lepus	long bone	shaft fragment		burned: white
FS 210	14.20S .30W Surface				
1	Sylvilagus sp.	femur	part of the proximal end and half of the shaft	right	white:sun bleach possible recent young adult
FS 259	11.5N 62° Surface				
1	small mammal s.o. Lepus	long bone	small shaft fragment		burned: white
FS 276	7.83 m. 90° 30' Surface				
1	medium to large mammal	long bone	small shaft fragment		burned: white
FS 375	92.15N 101.88E Level 1				
1,2	small to med. mammal s.o. Sylvilagus to Canis	long bone	small shaft fragments		burned: 1 white 1 gray
3	small to med. mammal	flat bone	small fragment		burned: white
FS 377	90.30N 103.20E Level 1				
1	small mammal s.o. Neotoma to Lepus	long bone	small shaft fragment		burned: gray
FS 391	92.27N 102.93E Level 1				
1	small mammal, s.o. Neotoma to Lepus	long bone	small shaft fragment		burned: gray
FS 425	89N 95E Level 1				
1	small mammal, s.o. Neotoma to Lepus	long bone	small shaft fragment		burned: gray

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 458	93.5N 103E Level 1				
1	medium to large	long bone?	very small fragment		burned: gray
2	sm. mammal or bird	not a long bone	small chip		burned: gray
FS 465	93.5N 102E				
1	small mammal s.o. Lepus or smaller	long bone	small shaft fragment		burned: white
2	medium to large mammal	unknown	very small fragment of cortext probably a long bone shaft fragment		burned: gray
FS 493	95N 100E Level 1				
1	unknown mammal Lepus to artiodactyl	unknown	cortext fragment		burned: white
FS 519	93.5N 102E Level 2				
1	med. to large mammal	long bone	small shaft fragment		burned: white
2	sm. to med. mammal s.o. Lepus to Canis	long bone, probably a rib	small shaft fragment		burned: white
FS 528	93.5N 10E				
1,2	med. to large mammal	long bone	small shaft fragments		burned: white
3,4	med. to lg. mammal	non-long bone	small fragments		burned:1 white,1 gray
5	small mammal	unknown	small fragment		burned: gray
FS 557	92.04N 100.88E				
1	medium to large mammal	long bone	small shaft fragment		burned: gray
FS 567	93.5N 102E				
1	mammal, s.o. Lepus or larger	long bone ?	very small fragment probably a shaft fragment		burned: white
FS 593	91.20N 102.02E				
1	med. to large mammal	long bone possibly a rib	small shaft fragment		burned:white/gray
FS 597	93.5N 101E Level 2				
1,2	mammal, larger than Lepus	long bone	shaft fragments		burned: white
3	med. to large mammal	long bone	shaft fragment		burned: gray
4	small mammal, s.o. Sylvilagus or smaller	long bone	shaft fragment		burned: gray

FA 3-3 (continued)

Element No.	Taxon	Element	Fragmentation	Side	Other
FS 602	93.5N 101E Level 2				
1	small mammal or bird s.o. Sylvilagus or smaller	long bone	shaft fragment		burned: gray
FS 637	99.32N 103.02E Level 2 Charcoal stain				
1	large mammal	long bone	shaft fragment		burned: gray
2	med. to large mammal	long bone	shaft fragment		burned: gray
3	med. to large mammal	flat bone	fragment		burned: white
FS 641	93.5N 101E Level 3				
1	medium to large mammal	long bone	shaft fragment		burned: brown
FS 669	93.5N 101E Level 4				
1	small mammal, s.o. Sylvilagus or smaller	long bone	shaft fragment		burned: white
2	same as above	long bone	shaft fragment		burned: gray
3	small to medium mammal	flat bone skull?	fragment		burned: brown
FS 682	95.15N 101.88E Level 2				
1	small mammal, s.o. Neotoma to Lepus	long bone	shaft fragment (2 pieces)		burned: brown
2	same as above	long bone	shaft fragment		burned: white
FS 700	93.5N 100E				
1-3	medium to large mammal	long bone	shaft fragments		burned: 2 white 1 gray
FS 715	93.5N 100E				
1	mammal	long bone	shaft fragment (3 pieces)		burned: gray

Chapter 12 • Food and Fuel Use at FA 2-13

Mollie S. Toll

Introduction

Floatation samples and macrobotanical materials collected from cultural deposits of FA 2-13 were submitted for analysis. This late Archaic/Basketmaker II site is located on a stabilized dune, above the braided channels and flood plain of the Farmington Glade arroyo system, and below colluvial and talus slopes flanked by sandstone outcrops. Varied floral resources are available within easy reach of the site. These include species of pinyon-juniper/grassland communities on the dune and colluvial slopes, and on the mesa immediately to the east of the site, and less than half a kilometer to the west across the arroyo system. Scrub/grasslands characterize the lower elevations.

Rabbitbrush, saltbush, and greasewood are more common on the floodplains, with sage and narrow-leafed yucca more frequent on the higher and coarser soils. Distribution of potential subsistence products in the grass and annual weeds categories also follows variability in soils and drainage characteristics: alkali sacaton, seepweed, mustards and goosefoots will be found in greater profusion on the finer sediments, for instance, while ricegrass, dropseed, and stickleaf will occur predominately on sandier soils towards the margins and mesas of the arroyo system.

Mountainous areas to the north provide true coniferous habitats (ponderosa pine, Douglas fir, and white fir). Given the ready availability of smaller timber (pinyon and juniper) for fuel and construction purposes in the immediate vicinity, these higher elevations were probably most important for hunting, with the addition of some minor but desirable plant products such as berries, rushes, and sedges. As there is no permanent water source close by, site inhabitants would likely have turned to shallow arroyo wells or some method of capturing seasonal run-off from the Hood Mesa Breaks and the arroyo system, in combination with hauling water from the La Plata River (2.1 km. away) or other more distant sources (J. Rancier, personal communication).

Artifact assemblages suggest that a variety of economic activities took place at FA 2-13, including meat processing and wild plant food preparation. Lithic reduction debris indicates production of butchering tools, and grinding stone fragments are present. Possible hearth areas indicate that plant and animal food products may have been cooked and eaten. While evidence of agricultural products is both tentative and meager, potential farm land is available in both sandy and sandy loam soils on the nearby floodplain.

The objective of the botanical analysis was the identification of both plant foods and fuel utilized at this site. Six floatation samples were taken from locations within or marginal to Features 1 and 3, possible hearths. Macrobotanical materials (largely charred juniper seeds) all came from non-feature grid units, mainly from the general occupation level at approximately one meter below datum.

Methods

Initial processing of floatation samples was carried out at the Castetter Laboratory for Ethnobotanical Studies, utilizing a simple technique based on the principle that organic materials tend to be less dense than water, and will float or remain in suspension. Coarse soils are particularly well suited to this technique, as the heavy sand particles sink rapidly in a water solution, thus affording a clean separation of materials. A measured volume of archeological matrix (ranging from slightly less to slightly more than one liter) was immersed in a bucket of water, and sand particles were allowed to settle out for a period of 30 to 45 seconds. The water was then poured through a fine mesh (0.35 mm.) screen. The bucket was subsequently filled and screened repeatedly, until no appreciable amount of material was left floating or in suspension. This basic method was used as long ago as 1936 (see Watson 1976:78), but did not become widely used for recovery of subsistence data until the 1960s and 70s (Struever 1968; Bohrer and Adams 1977).

The screened materials were subsequently dried on newsprint, and then sorted by particle size with the use of a series of graduated geological screens (mesh sizes 2.1, 1.0, 0.5, and 0.25 mm.). The screen separation produces a rough sorting of seed types, facilitating microscopic scanning and identification. Each particle size was sorted twice. For the second pass through, particles were rolled closer together, to expose different orientations of fragmentary and distorted plant parts. Small numbers of potentially identifiable seeds are often revealed by this second scan, but experiments have shown that subsequent scans rarely net additional seeds.

Seed taxa were identified at 10-45x magnification. In most cases, the taxon was determined at least to family level, and usually to genus or species. The numerical taxonomic coding system devised by Karen Adams was used (1978). Taxonomy and scientific nomenclature are used according to Martin and Hutchins (1981), and common names follow the Field Guide to Native Vegetation of the Southwest Region (USDA 1974). Seeds and other plant parts were also described as to their condition (color, damage, charring, and retention of such characteristics as hairs and shiny seed coats). Examples of certain non-botanical items were retrieved and their relative abundance noted. These included insect parts, small bones, feces (rodent or insect), and snails. Such information was recorded with the hope of isolating causes of disturbance in the ethnobotanical record.

A sample of 20 pieces of charcoal was identified from each floatation sample containing a sufficient number of pieces greater than 2 mm. Modern comparative specimens were carbonized by heating in sand at 450-500°F for 2-3 hours in a muffle oven, then scored with a sharp razor blade, snapped to expose transverse and radial sections, and glued on microscope slides. Archeological samples were snapped to expose a fresh transverse section, and identified at 45x. This simplified method of charcoal examination provides reliable identification on the level of conifer vs. non-conifer, and recognition of types with distinctive morphological constellations (such as Atriplex, Chrysothamnus, Quercus, Populus/Salix, and Pinus edulis) except when pieces are very small, or badly distorted in carbonization. A Juniperus type can be distinguished (although there is a possibility of confusion with Abies, or fir, which shares some basic morphological characters). Ring-porous and diffuse-porous classes of non-conifers are also distinguishable. More specific identifications require a greatly increased investment of time and expertise; for each specimen thin-sections in three orientations must be mounted on glass slides, and viewed at 200x or greater. Identifications at this level require as much as two hours per specimen, and years of experience. Given the relatively small investment of effort (two to three 20-piece samples can be processed in an hour), the "snap technique" provides good information, useful in distinguishing broad patterns of utilization of a major resource class. It should be evident that the analyst has an obligation to err on the side of caution with these identifications, and not imply greater taxonomic precision than the method warrants.

Table 12-1. Floatation Results, FA 2-13.

	Conifer	**Possible Economic Weeds**				**Cultivar**			**Total Seeds**	
	Juniperus Juniper	*Chenopodium* Goosefoot	*Suaeda* Seepweed	*Descurainia* Tansy Mustard	Unidentifiable 9999	*Zea Mays* Corn	No. Taxa	No. Taxa Burned	Actual	Estimated
#330 • Unit 7, Feature 1		6/30*		8/4.0*			2	2	14	7.0
#355 • Unit 16, Level 4		1/0.5*					1	1	1	0.5
#372 • Unit 14, Level 5	1/0.5*	4/2.2*			2/1.1*		3	3	7	3.8
#711 • Unit 20, Feature 1		3/1.5*				C*1	2	2	3	1.5
#712 • Unit 20, Feature 1		1/0.6*	2/1.3*				2	2	3	1.9
#756 • Unit 35, Feature 3		2/2.4*					1	1	2	2.4
Total estimated seeds	0.5	10.2	1.3	4.0	1.1					17.1
Percent estimated seeds	3	60	8	23	6					100

*Some or all specimens charred. Number above slash represents actual number of seeds counted; number below slash indicates estimated number of seeds per liter of soil.

[1]Identification very tentative (single cupule; badly eroded).

Results

Feature 1: The most prominent feature at FA 2-13 was an extensive scatter of fire-cracked rock with associated ash stain. Feature 1 was densest in Grid Units 7, 20, 19, and 6 (floatation samples #330, 711, and 712). Two other samples (#372 and 355) were taken from areas peripheral to Feature 1, within the discernible occupation level. Sample #372 was from an area of charcoal-stain without fire-cracked rock, and with less ash (Unit 16).

Small numbers of charred goosefoot (Chenopodium) seeds were found in all samples associated with Feature 1 (Table 12-1). This annual weed supplies a double crop of tender greens in spring, and abundant small seeds later in summer. Goosefoot is cited repeatedly in the ethnobotanical literature as a major constituent in the wild plant food diet (Castetter 1935:15-16; Elmore 1944:44; Jones 1930:21), and appears ubiquitously in floatation assemblages; Archaic/early Basketmaker references from northwestern Mew Mexico include Struever and Knight (1979); Toll and Donaldson (1981); Donaldson and Toll (1982); and Toll (1982).

There were charred seeds of two additional weeds in Feature 1: tansy mustard (Descurainia) in Unit 7 and seepweed (Suaeda) in Unit 20. Mustard greens, available as early as March or April, are an important spring crop (Castetter and Underhill 1935:24; Balls 1970:25-6). Though minute, mustard seeds are produced in great quantity and are easily harvested, and consequently are an important potential resource in areas with appropriate habitat conditions (slightly alkaline, fine-textured soils), and in years with sufficient winter and early spring precipitation. Seepweed is of more questionable economic utility. The herbage has a peculiar taste ("fetid and disagreeable" according to Balls [1970:80]) as well as texture (tough stems, rubbery leaves). Greens were sometimes used as a flavoring, much like saltbush (Castetter 1935:18-19; Curtin 1949:71). There is some record of utilization of seeds in a fashion similar to cheno-ams (ground to make a mush [Balls 11970:80-81]), and in the few cases where charred seepweed seeds are present in cultural contexts, they tend to occur with goosefoot.

Table 12-2. Charred Juniperus cf. monosperma Seeds at Site FA 2-13.

FS	Grid	Grid Unit	Level	Number of Halves	Number of Whole Seeds
252	105N/102E	11	2	1[1]	
335	106N/102E	9	4	1	
349	108N/106E	17	4	1	
396	109N/106E	15	6	1	
619	107N/105E	26	4	1	
766	110N/105E	31	4	2	
781	110N/105	31	5	3	
785	109N/103E	4	4	1	
789	109N/106E	15	5	1	
800	106N/104E	26	4	1	
826	104N/102E	18	4	1	
838	108N/105E	16	6	2	1
856	105N/104E	23	4	3	
865	108N/103E	6	4	1	
895	108N/104E	7	5	1	
906	109N/104E	5	3	3	3[2]
946	105N/102E	11	3	1	
956	108N/104E	7	4	1	
977	109N/105E	14	4	3	
982	108N/105E	16	3	2	3
987	109N/105E	14	5	3	
997	111N/104E	35	4	1	

[1]Unburned. [2]One partially carbonized.

Based on a sample of 20 charcoal fragments from Unit 14, only fuels were used in Feature 1 (including juniper, pinyon, and undetermined conifers [Table 12-3]). A single charred juniper seed occurred also in Unit 14 (Table 12-1), and may indicate either fuel or food use of this locally-common tree species.

Two tentative occurrences of carbonized corn remains at FA 2-13 are both associated generally with Feature 1. A single kernel was recovered in Unit 14 (macrobotanical specimen #977), and a possible cupule (the cob unit that holds a pair of kernels) in Unit 20 (floatation sample #711). As any evidence for relatively early farming at this site rests on the identity of these specimens, it must be emphasized that both specimens are incomplete and badly eroded, and that a positive identification is not possible.

Feature 3: A possible hearth consisting of a dense ash stain lay 3-4 meters to the north of Feature 1, and was represented by floatation sample #756. Goosefoot was again the single potential economic product (Table 12-1). Fuel remnants were entirely coniferous, as in Feature 1 (Table 12-3).

Miscellaneous Grid Units: Macrobotanical materials collected during excavation consisted almost entirely of juniper seeds. Nearly all specimens were charred, and all derived from the general occupation level (Table 12-2). Scattered distribution of these remains may be due to extensive rodent activity. While juniper was clearly a principal firewood at FA 2-13, retrieval of so many seeds suggests that the site residents also relied on the berries as a food source. Strong aromatic resins are present in the branches and berries of this conifer; this attribute is probably responsible for juniper's usage in ceremonial and medicinal contexts (Reagan 1928:158; Cook 1930:24), and to the usual relegation of the berries to food use as seasoning or a stress food (Castetter 1935:31-32; Swank 1932:50).

Discussion and Summary

The six samples from FA 2-13 contained a narrow but repeated assemblage of seed taxa. Goosefoot seeds including charred specimens were present in every sample in small numbers, while seepweed was recovered from the extensive ash stain. Both goosefoot and seepweed produce late summer/early fall seed crops, while the juniper seeds found throughout the site mature in fall and may be retained on trees into winter. The only late spring/early summer crop in evidence at this site is mustard seeds found in a single Feature 1 sample. Ricegrass, which matures at this same time and is abundant in the dune habitat where the site is located, is conspicuous by its absence. Indeed an oddity of the FA 2-13 floatation assemblage is that the edible weeds recovered in cultural contexts are in all cases characteristic of non-dune habitats: goosefoot, seepweed, and mustard all prefer finer-textured soils, and share a tolerance of slightly alkaline conditions.

The pattern of dependence on a few economic taxa, and particularly goosefoot, is seen repeatedly in Archaic/Basketmaker sites of the San Juan Basin (Table 12-4). In larger assemblages (as from the Navajo Mine Archeological Project and the Navajo Indian Irrigation Project, Block III) rare appearances of other weed species such as pigweed, tickseed, and mustard crop up. The promi-

Table 12-3. Charcoal From Floatation Samples, FA 2-13.

		Coniferous			
		Juniperus	Pinus edulis	Unknown	Total
FA 2-13					
372	No. of pieces	1	5	14	20
	Weight	0.1	0.3	0.5	0.9g
756	No. of pieces	8		12	20
	Weight	0.2		0.2	0.4g
No./Percent Pieces		9/23%	5/13%	26/65%	40/101%
Total/Percent Weight		0.3/23%	0.323%	0.7/54%	1.3/100%

Table 12-4. Floatation Assemblages from Archaic/Basketmaker Sites in the Four Corners Area.

			Shrubs/ Trees		Grasses			Economic Weeds									Other Economics		
	No. of Sites	No. of Samples	*Juniperus* Juniper	*Atriplex* Four-wing Saltbush	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	Others	*Amaranthus* Pigweed	*Chenopodium* Goosefoot	*Corispermum* Tickseed	*Suaeda* Seepweed	*Descurainia* Tansy Mustard	*Portulaca* Purslane	*Physalis/Solanum* Nightshade	*Mentzelia* Stickleaf	*Sphaeralcea* Globemallow	*Opuntia* Prickly Pear	Total No. Taxa	Total No. Taxa Burned
FA 2-13	1	6	1 (1*)						1 (6*)		1 (1*)	1 (1*)						6	6
NMAP[2]	3	32	1 (2)	1 (1*)	2 (12*)	3 (5*)	2 (2*)	1 (1*)	3 (13*)			1 (1*)			1 (3)	1 (2*)		15	8
NIIP:																			
Block III[3]	5	38	1 (1*)	2 (2)	2 (11*)		2 (9*)	1 (1*)	5 (22*)	1 (1*)		2 (3*)		1 (1*)	1 (2)	1 (2)	1 (1)	16	8
Blocks VI-VII[4]	4	9	1 (1)	1 (2*)	2 (3)	1 (3)		2 (2)	3 (7*)			1 (1)			1 (2)	2 (2)		10	2
Blocks VIII-IX[5]	8	21			5 (8)	3 (4)	2 (2)		7 (11)		1 (1)		1 (1)			2 (4)		11	1
Blocks VIII-XI[6]	7	41	1 (3)						3 (7*)									2	1

[1]Probable contaminant species are omitted: *Cryptantha, Lappula, Euphorbia, Salsola, Eriogonum, Dicoria,* and *Oenothera* (seeds are unburned and pristine in all cases).

[2]Toll 1982. [3]Struever and Knight 1979. [4]Toll and Donaldson 1981.

[5]Donaldson and Toll 1981. [6]Donaldson and Toll 1982. *charred in some or all samples.

nence of goosefoot at FA 2-13 is reinforced by its prominence regionally, which at the same time suggests that the low visibility of subordinate weed crops is essentially a sampling problem in poorly preserved early sites.

Looking at a wide selection of local sites (Table 12-4), it is also evident that grass seed crops (notably ricegrass, and secondarily dropseed) were an important food resource during this period. Both grow in dune habitats, and may have something to do with the widely-acknowledged association of Archaic period sites with dunal locations. On the NIIP Blocks, utilization evidence of spring crops (ricegrass, mustard) is sometimes found at the same sites as that of late summer seed crops (dropseed, goosefoot, [e.g., Struever and Knight 1979]), suggesting site occupation throughout the growing season, or multiple reoccupations of the same site. On the NMAP, the pattern is instead one of taxa sequestered in time (Toll 1982). These sites contained a single plant product, or multiple plant products maturing very close in time of year, suggesting shorter-term occupation. FA 2-13 may also reflect such a restricted occupation, and late summer to early fall seasonality indicated by economic plant detritus is reinforced by faunal evidence: the presence of antlers (J. Rancier, personal communication). There is every reason to expect that grasses were utilized at other Archaic sites nearby. It would be no surprise to recover smaller numbers of dropseed caryopses with a larger sample size at FA 2-13, or to recover ricegrass, with or without a narrow assortment of spring annuals, at other Farmington Glade dune sites.

Firewood preferences during the Archaic/early Basketmaker period are consistently characterized by utilization of wood species available in the immediate site vicinity, rather than any specific constellation of taxa. This pattern emerges by viewing fuel use over time throughout the region. In the area southwest of Farmington, shrubs such as saltbush, sage, and rabbitbrush were used exclusively in the Archaic, whereas the Anasazi made use of riparian species (cottonwood and willow), and Navajos used juniper almost exclusively (Minnis 1980; Toll 1982). To the east where scattered junipers grow on mesas, juniper wood forms a minor component of Archaic wood assemblages, and progressively more of Anasazi and Navajo usage (Ford 1980). The ready availability of juniper and pinyon on Farmington Glade dunes and colluvial slopes, and surrounding mesas, is ample reason to expect high percentages of these desirable fuel types in FA 2-13 charcoal. Further sampling at this or nearby contemporary sites might well turn up additional minor components of saltbush, greasewood, sage, or rabbitbrush.

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Chapter 13 • Food and Fuel Use at FA 1-6, 3-3, and 3-6

Mollie S. Toll

Introduction

Results from floatation and other botanical analyses are reported here for three small early Anasazi sites north (FA 1-6, FA 3-3) and east (FA 3-6) of Farmington, New Mexico. The northern two sites, on the southeast slope of Hood Mesa overlooking the Animas Valley, include structural features, as well as possible food processing loci such as hearths, and a storage or mealing area at FA 1-6. FA 3-6 is the most ephemeral of the three sites, with no structural remains but several probable deflated hearths, consisting of fire-cracked rock and ash stains. It is likely that all three sites served as residences and/or processing sites in connection with agriculture; each is located within 4 km. of some of the best land in the San Juan Basin for farming, in the floodplains of the Animas and San Juan River valleys.

The three sites are located within an area encompassing both Coniferous Woodland and Great Basin Desert Shrub vegetation formations (Donart et al. 1980). Sparse grass (including Indian ricegrass) and forb understories are scattered with yucca, prickly pear cacti, and shrubs and scrubby trees (sage, bitterbrush, oak, juniper). At slightly higher elevations (FA 1-6 and FA 3-3) pinyons are also present.

Floatation and macrobotanical analyses were conducted in order to study processing or storage of cultivated crops. Evidence of local food and fuel products was also sought. Floatation analysis included 15 samples from FA 1-6, 4 from FA 3-3, and 23 from FA 3-6. Charcoal collected for species identification included 20 piece samples from floatation samples, and specimens retrieved from hearths and burn areas during excavation. Macrobotanical collections from each site included plant remains large enough to be recognized by excavators with the naked eye.

Methods

Initial processing of floatation samples was carried out at the Castetter Laboratory for Ethnobotanical Studies, utilizing a simple technique based on the principle that organic materials tend to be less dense than water, and will float or remain in suspension. Coarse soils are particularly well suited to this technique, as the heavy sand particles sink rapidly in a water solution, thus affording a clean separation of materials. A measured volume of archeological matrix (about one liter), was immersed in a bucket of water, and sand particles were allowed to settle out for a period of 30 to 45 seconds. The water was then poured through a fine mesh (0.35 mm.) screen. The bucket was subsequently filled and screened repeatedly, until no appreciable amount of material was left floating or in suspension. The basic method has been used as long ago as 1936 (see Watson 1976:78) but did not become widely used for recovery of subsistence data until the 1960s and 70s (Struever 1968; Bohrer and Adams 1977).

The screened materials were subsequently dried on newsprint, and then sorted by particle size with the use of a series of graduated geological screens (mesh sizes 2.0, 1.0, 0.5, and 0.25 mm.) The screen separation produces a rough sorting of seed types, facilitating microscopic scanning and identification. Each particle size was sorted twice. For the second pass, particles were rolled closer together, to expose different orientations of fragmentary and distorted plant parts. Small numbers of potentially identifiable seeds are often revealed by this second scan, but experiments have shown that subsequent scans rarely net additional seeds.

Seed taxa were identified at 10-45x magnification. In most cases, the taxon was determined at least to family level, and usually to genus or species. The numerical taxonomic coding system devised by Karen Adams was used (1978). Taxonomy and scientific nomenclature are used according to Martin and Hutchins (1981), and common names follow the Field Guide to Native Vegetation of the Southwest Region (USDA 1974). The condition of seeds and other plant parts was described (e.g., color, damage, charring, and retention of such characteristics as hairs and shiny seed coats). Examples of certain nonbotanical items were retrieved and their relative abundance noted. These included insect parts, small bones, feces (rodent or insect), and snails. Such information was recorded with the hope of isolating causes of disturbance in the ethnobotanical record.

A sample of 20 pieces of charcoal was identified from each floatation sample containing a sufficient number of pieces greater than 2 mm. Modern comparative specimens were carbonized by heating in sand at 450-500°F for 2-3 hours in a muffle oven, then scored with a sharp razor blade, snapped to expose transverse and radial sections, and glued on microscope slides. Archeological samples were snapped to expose a fresh transverse section, and identified at 45x. This simplified method of charcoal examination provides reliable identities on the level of conifer vs. nonconifer, and recognition of types with distinctive morphological constellations (such as Atriplex, Chrysothamnus, Artemisia, Quercus, Populus/Salix, and Pinus edulis) except when pieces are very small, or badly distorted in carbonization. A Juniperus type can be distinguished (although there is a possibility of confusion with Abies, or fir, which shares some basic morphological characteristics). Ring-porous and diffuse-porous classes of nonconifers are also distinguishable. More specific identifications require a greatly increased investment of time and expertise; for each specimen thin-sections in three orientations must be mounted on glass slides, and viewed at 200x or greater. Identifications at this level require as much as two hours per specimen, and years of experience. Given the relatively small investment of effort (two to three 20 piece samples can be processed in an hour) the "snap technique" provides some good information, useful in distinguishing broad patterns of utilization of a major resource class. It should be evident that the analyst has an obligation to err on the side of caution with the identification, and not imply greater taxonomic precision than the method warrants.

Results

FA 1-6

The principal structure at this site (Feature 3) was a pitstructure; to this was attached a small sandstone-slab storage structure (Feature 4). Charred juniper remains were recovered from floatation (Sample 353; Table 13-1) and during excavation (401; Table 13-2) in the storage area. Macrobotanical materials recovered from a level above Feature 3 included carbonized juniper seeds and a corn cob fragment (287). An ash dump area (Feature 5) within the structure also produced corn remains (floatation sample 337). Two extra-mural ash dump/midden areas contained a variety of probable economic detritus: Feature 6 held charred juniper seeds (floatations 387 and 388; macrobotanical 379), ricegrass (389) and cholla (388 seeds, and corn (388, 389), while Feature 7 had juniper (350), saltbush fruits (350, 429), and corn (350).

Carbonized plant debris recovered at this site includes taxa abundantly documented in the ethnographic literature as food products (juniper berries, ricegrass, cholla, as well as corn) and materials probably present in connection with fuel use (juniper twigs, saltbush fruits; see below). Ricegrass caryopses are available in late spring, while all other food resources recovered here ripen in late summer to early fall. Juniper berries persist on trees well after their fall ripening date, providing one of the few plant food products gatherable in winter.

Uncharred plant materials at FA 1-6 include juniper seeds and twigs, pinyon nutshell, Mormon tea seeds, and annual weed seeds (goosefoot, pigweed, and hiddenflower). As most of these taxa grow in the immediate site environs, and site deposits are shallow, eroded, and extensively rodent-disturbed, the unburned materials should all be suspected as postoccupational contaminants.

The principal element of FA 1-6 charcoal is juniper wood (Table 13-3), a preferred fuel type available in abundance in the immediate site vicinity. A sizeable amount of cottonwood/willow (probably obtained along the permanent watercourse of the nearby Animas) is also present, chiefly from Feature 6, the extra-mural midden. Charred saltbush twigs also occur and were particularly numerous in Feature 7 (floatation sample 350); charred four-wing saltbush fruits in this same sample may well be from fuel-use of this local shrub. Sage and rabbitbrush were found, but in very small quantities. The sizeable element of riparian woods at FA 1-6 may represent use of these relatively straight and fast-growing taxa for construction rather than fuel. Minnis (1978) was able to demonstrate at Tsaya Wash, west of Chaco, that burned roof fall contained predominantly cottonwood/willow, while hearths produced charcoal of local shrubs. While no FA 1-6 proveniences can be clearly defined as roof fall, similar functional differences may have been in force here.

FA 3-3

The few (four) floatation samples from this site all came from Feature 13, a pithouse structure, and are largely barren. Sample 688 contained a partial charred juniper seed, and a possible corn cupule (Table 13-4). A nearby non-structural use area (Locus 4, a cluster of hearth pits sheltered on one side by a sandstone outcrop and on the other by a large boulder) produced additional carbonized juniper material. These include seeds present in Feature 3, a slab-lined roasting pit (macrobotanical specimen 221; Table 13-2) and seeds associated with Stratum 1 (431). A single wood sample from the pithouse (floatation sample 656) was composed entirely of juniper charcoal.

FA 3-6

Juniper remains are ubiquitous from this site. Twigs, largely unburned, were present in nearly every sample (Table 13-5) and are probably occupational or postoccupational background debris (being shed constantly by the trees which are common in the vicinity). Juniper seeds, and sometimes entire berries, occur in fewer samples (Table 13-5) and also as macrobotanical specimens (Table 13-2). Rodent teeth marks on several unburned seeds in sample 533 (Unit 28, Level 3) indicate rodent predation on human food waste products, or rodent food use of juniper seeds, during or after site occupation. Other seeds in this sample were charred, however, indicating clear association with the human occupation. Carbonized juniper seeds were recovered in only two other instances, both in Locus 1, a large charcoal stain with firecracked rock (floatation sample 584), and macrobotanical sample 530. Most juniper seeds and berries from this site, as well as FA 1-6 and FA

Table 13-1. Floatation Results (Number of Seeds) From FA 1-6.

		Conifers		Woody Perennials		Grasses		Possible Economic Weeds					Probable Contaminants						Cacti	Cult.	Total Seeds			
		Juniperus Juniper	*Pinus edulis* Pinyon	*Atriplex* Four-winged saltbush	*Ephedra* Mormon Tea	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Amaranthus* Pigweed	*Chenopodium* Goosefoot	Cheno-Am	*Descurainia* Tansy Mustard	*Mentzelia* Stickleaf	*Polanisia* Clammyweed	*Astragalus* Locoweed	*Cryptantha* Hiddenflower	9029	9089	9999	*Opuntia* Cholla Cactus	*Zea Mays* Corn	No. Taxa	No. Taxa Burned	Actual	Estimated
147	100N/106E, Testing	T			5/2.5										1/0.5						3	0	6	3.0
158	Level 2 Feature 4?	8/4.0													2/1.0			1/0.5			3	0	11	5.6
172	100N/106E Testing	1/0.5							1/0.5						2/1.0						3	0	4	2.0
329	Unit 51, Feature 3																				0	0	0	0
337	Locus 1, Feature 5																			C*	1	1	+	+
344	Locus 1 Feature 5																				0	0	0	0
350	Feature 7, Level 2	1/0.5*		2/0.1*																C*	3	3	3	1.5
353	Locus 1, Feature 4	T*																			1	1	+	+
356	Locus 1, Feature 4																				0	0	0	0
357	Locus 1, Feature 8	2/1.0	+																		2	0	2	1.0
382	Locus 1, Feature 6	T																			1	0	+	+
387	Locus 1, Feature 6	4/2.0*																			1	1	4	2.0
388	Locus 1, Feature 6	4/2.0*																	1/0.5*	C*	3	3	5	2.5
389	Locus 1, Feature 6	7/3.5*				1/0.5*		1/0.5												C	4	3	9	4.5
429	Feature 7			1/0.5*																	2	1	1	0.5
Total est. seeds		13.6	+	0.6	2.5	0.5	—	0.5	0.5	—	—	—	—	—	2.5	—	—	0.5	0.5	+				21.7
Percent est. seeds		63		3	12	2	—	2	2	—	—	—	—	—	12	—	—	2	2					100
No. samples (n=15)		11	1	2	1	1	—	1	1	—	—	—	—	—	3	—	—	1	1	4				
Percent samples (n=15)		73	7	13	7	7	—	7	7	—	—	—	—	—	20	—	—	7	7	27				

T - Twig (juniper) C - Cupule, or cob fragment (corn)

Table 13-2. Macrobotanical Remains From FA 1-6, 3-3, and 3-6.

	Conifers		Woody Perennials		Weeds		Cultivar	Unk.
	Juniperus seeds	*Pinus edulis* nutshells	*Ephedra viridis* seeds	*Eleagnus angustifolia* seeds	cf. Compositae achenes	cf. Leguminosae seeds	*Zea*	Seeds
FA 1-6								
147A 100N/106E Level 4								10
154A 100N/106E Level 5	2 seeds, 1 fragment		1					11
161A Level 2 east of stone alingment	5 berries 1 seed 4 seed frags. 1 twig frag.	2	4		2^m			
287 Grid 57 Level 1	3 seed frags.*						1 cob frg.*	
379 Grid 74 Level 1 (stain)	3 seed frags.*							
401 Grid 51 Level 2	1 seed frag.*							
FA 3-3								
221 Fea. 3(pit)	7 seeds* 3 seed frags.*							
292 Locus 10 Gr.46, Level 1	3 $seeds^m$							
431 Locus 4 Gr.28, Str. 1	5 seeds*							
484 Locus 9 Gr.74, Fea.1	3 seeds*							
537 Locus 6 Gr.90, Lev.1						1^m		
639 Locus 6, Gr.106, Lev.2						1^m		
646 Locus 6 Gr.10, Lev. 1						1^m		
FA 3-6								
223 Test Pit 1 Level D	2 seeds 8 seeds frg.							
224 Test Pit 1 Level E	6 seeds 7 seed frg.							
225 Test Pit 1 Level F	1 seed frag.							
227 Test Pit 1 Level G	1 seed frag.							
530 Grid 28 Level 3	1 seed frag.*							
556 Locus 1 Level 2 (charcoal)							1 cupule*	
697 Locus 1 Grid 11 Level 2 (stain)	2 berries 5 seeds 17 seed frag.							
698 Locus 1 Grid 11 Level 2 (stain)				1^m				

*charred ^{m}modern intrusives (pristine, or nearly so)

Table 13-3. Species Composition of Charcoal, FA 1-6, 3-3, and 3-6.
(Upper Number = no. of pieces; lower number = weight in grams.)

		Coniferous	Non-Coniferous								
		Juniperus	*Atriplex*	*Artemisia*	*Chrysothamnus*	*cf. Compositae*	*Populus/Salix*	*Unidentified*	*All Non-Con.*	*Unknown*	*Total*
FA 1-6											
Floatation:											
147	100N/106E	19/0.9	1/+						1/+		20/0.9g
337	Locus 1 Unit 71	19/0.5					1/+		1/+		20/0.5g
344	Locus 1	20/0.2									20/0.2g
350	Unit 75 Level 2	5/0.1	13/1.0				1/+	1/+	15/1.0		20/1.1g
382	Locus 1 Unit 4	4/+			1/0.1		13/1.3	2/+	16/1.4		20/1.4g
387	Locus 1 Feature 6	9/0.3					8/0.4		8/0.4	3/+	20/0.7g
388	Locus 1 Feature 6	10/0.3				1/+	7/0.1		8/0.1	2/+	20/0.4g
389	Locus 1 Unit 74	13/0.4					4/0.2		4/0.2	3/+	20/0.6g
Macro:											
154A	100N/106E Level 5	12/0.3	4/0.1	1/+			2/+	1/+	8/0.1		20.04g
287	Grid 57			+				1/+	1/+		1/+
TOTAL:											
	No. pieces	111	18	1	1	1	36	4	61	8	181
	Percent pieces	61	10	1	1	1	20	2	35	4	100
	Weight	3.0	1.1	+	0.1	+	2.0	+	3.2	+	6.2g
	Percent Weight	48	18	+	2	+	32	+	52	+	100

+less than 0.05 g or 0.05%

Table 13-3. Species Composition of Charcoal, FA 1-6, 3-3, and 3-6.
(Upper Number = no. of pieces; lower number = weight in grams.) (Continued)

		Coniferous	Non-Coniferous								
		Juniperus	*Atriplex*	*Artemisia*	*Chrysothamnus*	*cf. Compositae*	*Populus/Salix*	*Unidentified*	*All Non-Con.*	*Unknown*	*Total*
FA 3-3											
Floatation:											
656	Locus 6 Fea. 13	20/1.0									20/1.0g
FA 3-6											
Floatation:											
683	Locus 1 Grid 11	20/0.3									20/0.3g
733	Locus 1 Level 1	14/0.4	1/+	4/0.1				1/+	6/0.1		20/0.5g
Macro:											
595	Grid 23 Level 2	12/0.2				2/+			2/+		14/0.2g
698	Locus 1 Grid 11 Level 2	2/+									2/+
698a	Locus 1 Grid 11 Level 2	12/0.9									12/0.9
TOTAL:											
	No. pieces	60	1	4		2		1	8		68
	Percent pieces	88	1	6		3		1	11		99
	Weight	1.8	+	0.1		+		+	0.1		1.9g
	Percent Weight	95	+	5		+		+	5		100

[a]unburned wood

3-3, can be assigned to the species Juniperus osteosperma; some, however, conform in size and morphology to J. monosperma, and a few are intermediate between the two types. The study area is in a border zone for the natural ranges of both species (Anne Cully, personal communication), and consequently both can be expected in site deposits.

Pinyon nutshell was found in only one of the 23 samples examined from this site (584, Locus 1). As at FA 1-6 this specimen was unburned, so cultural origin is uncertain.

Among economic weed species at FA 3-6, goosefoot was found most commonly (ten samples [Table 13-5]), and seepweed and stickleaf less often. Other weed species that are present as unburned specimens include locoweed and clammyweed; as these seeds are pristine and the taxa have ethnographic records of avoidance as foodstuffs, the seeds are probably contaminants. The few unburned goosefoot and seepweed seeds, on the other hand, are eroded and oxidized, and may possibly be late Basketmaker subsistence debris. Stickleaf is a late spring crop; otherwise all FA 3-6 wild food products were gatherable in late summer to fall.

A carbonized corn cupule was recovered in the charcoal level of the Locus 1 stain area (macrobotanical specimen 556). This is the single record of agricultural crops at site FA 3-6.

Charcoal at this ties is almost entirely juniper, with only tiny amounts of local shrubs, and no cottonwood/willow component (Table 13-3). All charcoal specimens derive from the Locus 1 stain. We can suggest reasonably that this provenience represents either a single redistributed burning feature (such as a hearth), or that if it represents a dump area, the wood debris is largely from a single functional feature type (again, hearths, as opposed to construction material).

Discussion and Summary

The Anasazi subsistence record is characterized throughout northwestern New Mexico by a wide spectrum of food products documenting the entire growing season. Weedy species tend to be particularly well-represented, with goosefoot the single most consistent taxon. Other weeds show more localized abundance, e.g., purslane (Portulaca) in the Chuska Valley and farther south (Struever 1980; Minnis 1978; Toll and Donaldson 1982), and winged pigweed east of Chaco (Donaldson and Toll 1982). Pigweed, mustard, and stickleaf are three economic annuals used generally throughout the San Juan Basin for which we have evidence of Puebloan utilization in the Farmington area Elena Gallegos sites.

Non-weedy economic species (cacti, yucca, reeds, and sedges), when found, tend to occur in low quantities. Thus, their absence from particular site assemblages may signal poorer preservation conditions, rather than their omission from the array of utilized food and manufacturing products. In the well-drained slopes and foothills north of Farmington, several types of cacti (including prickly pear, cholla, and hedgehog) are found along with yucca. Both resource groups were undoubtedly made use of by Anasazi residents, though the only evidence of such use at these three sites is a single charred cholla seed at FA 1-6. Reeds and sedges were likely available along the permanent river courses, but no evidence of their use persists at these sites. Pinyon nuts should have been exploited extensively, as they are available in quantity at close range and are high in calories, oil, and protein (Ford 1968:158). Yet nutshell remains seem to be subject also to differential degradation conditions, and are recovered far more frequently at deeper and better-preserved sites (Donaldson and Toll 1982; Toll n.d.). Pinyon shell was recovered in only a few instances (FA 1-6 and FA 3-6) and was always unburned (and hence possibly intrusive).

Corn remains (charred cob fragments at all three sites) were the only cultivar debris recovered. While corn may indeed have been the principal agricultural crop, absence of remains of squash and beans may be an inaccurate reflection of their actual importance, due to factors of differential deposition and preservation (Gasser and Adams 1981; Cutler and Whitaker 1961; Kaplan 1956).

Anasazi fuel use in the San Juan Basin can be related to both availability and functional preferences. Local abundance of conifers is evident in the charcoal assemblages from FA 1-6, 3-3, and 3-6, while other shrubs occur in low frequencies (saltbush, sage, and rabbitbrush). The most widely-used prehistoric fuel type in the San Juan Basin by contrast is saltbush (Minnis 1980; Toll 1983), with significant components of juniper and greasewood in the NIIP Blocks (Ford 1980), greasewood in Chaco (Welsh 1979), and sage in the Bis sa'ani community east of Chaco (Donaldson and Toll 1982). The substantial segment of cottonwood/willow recovered at FA 1-6 may reflect use for construction rather than as fuel.

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Table 13-4. Floatation Results (Number of Seeds) From FA 3-3.

		Conifers		Woody Perennials		Grasses		Possible Economic Weeds					Probable Contaminants						Cacti	Cult.	Total Seeds			
		Juniperus Juniper	*Pinus edulis* Pinyon	*Atriplex* Four-winged saltbush	*Ephedra* Mormon Tea	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Amaranthus* Pigweed	*Chenopodium* Goosefoot	Cheno-Am	*Descurainia* Tansy Mustard	*Mentzelia* Stickleaf	*Polanisia* Clammyweed	*Astragalus* Locoweed	*Cryptantha* Hiddenflower	9029	9089	9999	*Opuntia* Cholla Cactus	*Zea Mays* Corn	No. Taxa	No. Taxa Burned	Actual	Estimated
640	Locus 6 Unit 106 Level 2 Feature 13																				0	0	0	0
641	Locus 6 Unit 106 Level 2 Feature 13																				0	0	0	0
656	Locus 6 Feature 13																				0	0	0	0
688	Locus 6 Feature 13	1/0.5*																		[c*]	2	2	1	0.5

c = cupule.

Table 13-5. Floatation Results (Number of Seeds) From FA 3-6.

		Conifers		Woody Perennials		Grasses		Possible Economic Weeds					Probable Contaminants						Cacti	Cult.	Total Seeds			
		Juniperus Juniper	*Pinus edulis* Pinyon	*Atriplex* Four-winged saltbush	*Ephedra* Mormon Tea	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Amaranthus* Pigweed	*Chenopodium* Goosefoot	Cheno-Am	*Descurainia* Tansy Mustard	*Mentzelia* Stickleaf	*Polanisia* Clammyweed	*Astragalus* Locoweed	*Cryptantha* Hiddenflower	*Suaeda* Seepweed	9089	9999	*Opuntia* Cholla Cactus	*Zea Mays* Corn	No. Taxa	No. Taxa Burned	Actual	Estimated
219	Feature 1, Test Pit 1								14/ 23.3*									1/ 1.7*			2	2	15	25.0
526	Loc. #1 Unit 28, Level 12	T							1/ 0.5*								1/ 0.5 1/ 0.5	2/[1] 1.0*			3	2	4	2.0
533	Unit 28, Level 3	44/* 22.0							1/ 0.5												3	1	46	23.0
550	Unit 14 Level 2	T				1/ 0.5				1/ 0.5*						2/ 1.0		1/ 0.5*			5	2	5	2.5
554	Loc. #1 Unit 3 Level 2	T														1/ 1.0*					2	1	1	1.0
564	90.07 N/ 101.55E	T							6/ 3.9*												2	1	6	3.9
584	Locus #1 Unit 20 Level 2	1/ 0.5*	1/ 0.5						2/ 1.0*	1/ 0.5				1/ 0.5							5	3	6	3.0
588	Locus #1 Unit 5 Level 2																				0	0	0	0
630	Locus #1 Unit 23, Level 2	T							4/ 2.0*			1/ 0.5*	1/ 0.5					+*			5	3	6	3.0
631	Locus #1 Unit 8 Level 2																				0	0	0	0

[1]Tule Springs Unknown. T = twigs.

Table 13-5. Floatation Results (Number of Seeds) From FA 3-6 (continued).

		Conifers		Woody Perennials		Grasses		Possible Economic Weeds					Probable Contaminants						Cacti	Cult.	Total Seeds			
		Juniperus Juniper	*Pinus edulis* Pinyon	*Atriplex* Four-winged saltbush	*Ephedra* Mormon Tea	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Amaranthus* Pigweed	*Chenopodium* Goosefoot	Cheno-Am	*Descurainia* Tansy Mustard	*Mentzelia* Stickleaf	*Polanisia* Clammyweed	*Astragalus* Locoweed	*Cryptantha* Hiddenflower	*Suaeda* Seepweed	9089	9999	*Opuntia* Cholla Cactus	*Zea Mays* Corn	No. Taxa	No. Taxa Burned	Actual	Estimated
646	Feature 1 Unit 12 Level 2	6/ 5.8																			1	0	6	5.8
648	Feature 1 Unit 12'	1/ 0.7																			1	0	1	0.7
651	Feature 1 Unit 13 Level 2	2/ 1.4																			1	0	2	1.4
658	Feature 1 Unit 16																				0	0	0	0
661	Feature 1 Locus #2 Level 2	1/ 0.6																			1	0	1	0.6
665	Unit 26 Locus #2 Level 2	T																			1	0	0	0
667	Locus #2 Unit 26	1/ 0.5			2/ 1.0																2	0	3	1.5
678	Grid 6 Level 2	T							3/ 3.1*												2	1	3	3.1
683	Grid 11 Level 2	1/ 0.5							10/ 6.0*												2	1	11	6.5

T = twigs.

Table 13-5. Floatation Results (Number of Seeds) From FA 3-6 (continued).

		Conifers		Woody Perennials		Grasses		Possible Economic Weeds					Probable Contaminants						Cacti	Cult.	Total Seeds			
		Juniperus Juniper	*Pinus edulis* Pinyon	*Atriplex* Four-winged saltbush	*Ephedra* Mormon Tea	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Amaranthus* Pigweed	*Chenopodium* Goosefoot	Cheno-Am	*Descurainia* Tansy Mustard	*Mentzelia* Stickleaf	*Polanisia* Clammyweed	*Astragalus* Locoweed	*Cryptantha* Hiddenflower	*Suaeda* Seepweed	9089	9999	*Opuntia* Cholla Cactus	*Zea Mays* Corn	No. Taxa	No. Taxa Burned	Actual	Estimated
707	Locus #1 Unit 11, Level 3	T																			1	0	0	0
720	Unit 11, Level 2	T							2/ 1.0*												2	1	2	1.0
733	Locus #1 Level 1	1/ 0.6																1/ 0.6			2	0	2	1.2
749	Locus #1 Level 2								3/ 2.0*							1/ 0.7					2	1	4	2.7
Total adjusted seeds		32.6	0.5	—	1.0	0.5	—	—	43.3	0.5	—	0.5	0.5	0.5	—	3.2	1.0	3.8	—	—				87.9
Percent adj. seeds		37	1	—	1	1	—	—	49	1	—	1	1	1	—	4	1	4	—	—				102
No. of samples (n=23)		18	1	—	2	1	—	—	10%	1	—	1	1	1	—	4	1	4	—	—				
Percent of samples (n=23)		73	4	—	9	4	—	—	43	4	—	4	4	4	—	17	4	17	—	—				

T = twigs.

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Chapter 14 • Botanical Remains From FA 1-2, 1-5, 1-10, 2-6, 2-8, 2-16, 2-17, and 3-3

Marcia L. Donaldson

Introduction

Floatation samples and macrobotanical materials were collected during the excavation of eight archeological sites north and east of Farmington, New Mexico (FA 1-2, 1-5, 1-10, 2-6, 2-8, 2-16, 2-17, 3-3). Previous excavations within the project area had concentrated on early Anasazi sites containing numerous features and some habitation structures. Botanical data obtained from these sites documented the exploitation of local economic weeds, particularly goosefoot, as well as the cultivation of corn. Charcoal recovered from hearth samples indicated the use of local trees (largely juniper) and shrubs as fuel sources (Toll, this volume). The botanical materials of concern here were collected from a more varied array of site-types, including several lithic and artifact scatters, a small rockshelter, and an early Anasazi habitation site. Samples collected from these sites were examined to determine if similar plant food and fuel resources were used in the different site types, or if differences in resource exploitation could be detected.

All of the sites investigated are located on the mesas and mesa slopes bordering the Animas and San Juan River valleys and their tributaries. Those in higher elevations tend to be situated in an open pinyon-juniper woodland while lower sites lie in a scrub/grassland community with some scattered junipers present. The woodland understory includes oak and other scrubby trees as well as yucca, prickly pear and hedgehog cactus, and scattered grasses. Grasses and weedy annuals continue in lower elevations, mixing with abundant shrubs such as sage and saltbush. A more riverine community in the river valley supports willows and cottonwoods along with water-loving sedges and rushes.

The recovery of corn remains from several of the sites (Toll, this volume) suggests that there was some agriculture. Although small fields utilizing runoff could have been located in the rocky mesa areas, it is more likely that they were located in the fertile valley bottoms several kilometers away. It is difficult to determine whether the mesa sites served as bases for agricultural activities or whether they represent more specialized camps for the collection of local wild resources. One of the primary questions regarding prehistoric plant utilization in the excavated sites will concern the differentiation of local and more riverine resource exploitation. Special collection (limited activity) sites would be expected to contain primarily local resources while more general use (habitation) sites would yield a greater variety of remains originating from a number of different vegetation communities.

Of the 49 floatation samples examined, 35 were taken from an early Anasazi habitation site (FA 3-3) that included numerous extramural features in addition to a residential structure (pithouse). The other samples were from possible hearth areas in artifact and lithic scatters. Two macrobotanical samples were also recovered from an artifact scatter (FA 2-8).

Methods

The recovery of small botanical remains through water separation, or floatation, is based on the fact that organic debris has a lighter specific gravity than water, and so will float or hang in suspension when added to the heavier medium. In the past 20 years a number of techniques have been developed to retrieve plant materials from archeological soil samples (Watson 1976), their complexity usually determined by the type and amount of soil to be processed, as well as the materials at hand. The dry sandy soils of northwest New Mexico lend themselves to a simple process that has proved to be successful in the recovery of small plant remains (Bohrer and Adams 1977).

In this process a known volume of soil is added to water, stirred, and allowed to sit for 30 to 40 seconds for heavier dirt particles to settle. The water, with vegetal contents either floating or in suspension, is then poured through a fine screen, keeping the heavier sediment in the bottom of the bucket. This procedure is repeated until organic material is no longer visible in the water. The recovered plant remains are dried slowly before storage or preparation for sorting.

Samples are sorted by viewing the recovered materials through a dissecting microscope at 10x and removing seeds and other diagnostic plant parts for identification. Large samples are first passed through a series of nested geologic screens (2.0, 1.0, 0.5, and 0.24 mm. mesh) for initial size separation. Generally, the first two size categories are totally sorted, while the smaller materials may be sampled by taking a known fraction for examination. When this occurs, the estimated total will be determined by dividing the actual number of seeds by the amount sampled. For example, if 50 seeds were found in a 50 percent sample, the estimated number of seeds would be 100 (50/50). All materials were identified to the family level, and most as far as genus or species. Taxonomy and nomenclature are used according to Martin and Hutchins (1981), and common names follow the Field Guide to Native Vegetation of the Southwest Region (USDA 1974).

During the initial sort of floatation matrices, a sample of 20 pieces of charcoal is removed from the larger size fractions. When large enough, the charcoal is snapped to expose a fresh cross-section of the wood grain. This is viewed under 45x magnification, and identified by comparison with modern carbonized wood specimens. Unless the pieces are badly eroded, this method allows reliable identification of general wood groups and types with distinctive morphological characteristics (such as pinyon, juniper, oak, cottonwood/willow). Identifications made in this fashion are reliable only at this general level, however, and should not be confused with more specific identifications made by viewing thin sections at considerably higher power (200x).

Plant materials recovered from archeological sites have been deposited through natural processes as well as through disposal during the prehistoric site occupation. One of the most difficult problems in the study of these remains is the separation of debris associated with the cultural deposits from those introduced through natural means. In open, unprotected sites, organic material disintegrates rapidly through predation by rodents, insects, and bacteria, combined with physical erosion and breakdown of plant tissues (see Minnis [1981] for discussion). Charring of plant remains, probably during the site occupation, adds to their durability, allowing them to survive for thousands of years in favorable circumstances. Charred remains, especially from open sites, can therefore be most reliably attributed to cultural deposition processes, while unburned materials are probably natural (post-occupational) introductions.

Results

FA 1-2

Possible hearth areas in this artifact scatter were represented by clusters of fire-cracked rock and associated charcoal stains. The numerous pieces of groundstone recovered suggest that plant-food processing was one of the activities that occurred during site occupation. Unfortunately, little botanical evidence survived to support this notion. Floatation samples from two possible hearth areas (Samples 68 and 74) contained only unburned juniper twigs, pinyon needles, and a few tansy mustard seeds (Table 14-1). All three taxa occur in the site area today, and it is probable that they were recently deposited through natural processes. The absence of charcoal in the tested features indicates that even carbonized materials were poorly preserved in these near-surface proveniences.

FA 1-5

One rodent-disturbed hearth was associated with this artifact scatter. A floatation sample (Sample 29) from the hearth fill included burned juniper seeds, as well as uncharred juniper twigs and grass and weed seeds (Table 14-1). Although both ricegrass and goosefoot are well-documented economic plants, their presence in the hearth fill does not appear to be associated with the feature use. Fuel remains included both pinyon and juniper charcoal (Table 14-4); the burned juniper seeds may have been accidentally included with these. All of the remains recovered, both charred and uncharred, represent plant taxa growing in the surrounding pinyon-juniper woodlands today.

FA 1-10

This sparse lithic scatter is situated in a dune blowout area that supports both juniper and ephedra. A shallow charcoal stain (Sample 3) contained only a few unburned specimens of tickseed, a taxon that has been recovered in charred condition from several Anasazi sites and appears to have been exploited prehistorically (Table 14-1). The seeds recovered from this site, however, are in relatively pristine condition and are probably recent introductions unrelated to the site occupation. A burned juniper seed was recovered during excavation, although no charcoal was present in the floatation sample. This suggests that the possible hearth area had been exposed to the elements, resulting in the dispersal and disintegration of its organic contents.

FA 2-6 (B)

Situated adjacent to a wash in the pinyon-juniper woodland, this sherd scatter included one hearth area. Although the hearth fill was charcoal-stained, a floatation sample (Sample 21) yielded neither seeds nor charcoal (Table 14-1). Poor preservation within the feature may have been caused by the exposure of the hearth, or by its location immediately on bedrock. Moisture would tend to collect over this impermeable layer, and would hasten the disintegration of organic debris.

FA 2-8

Although over half of this site has been eroded away by an adjacent wash, remaining portions contained a number of hearths and associated lithic scatters. Two hearths situated next to each other (Samples 85, 104) contained juniper charcoal as well as other juniper remains (Tables 14-1 and 14-4). Fragments of uncharred pinyon nut shells and juniper seeds were recovered during the excavation of the layer overlying these hearths (Macrobotanical Sample 84). Two other hearths (Samples 78 and 88) were sampled and also contained specimens of juniper. Uncharred juniper seeds (Macrobotanical Sample 74) were collected while excavating in 100N, 90E, but they do not appear to be associated with a feature or cultural deposits. Both pinyon and juniper are

Table 14-1. Floatation Results From Sites FA 1-2, 1-5, 1-10, 2-6B, 2-8 and 2-17.

	Conifer		Grass		Possible Economic Weeds				Probable Contaminants						Cacti		Cult.				Total Seeds	
	Juniperus Juniper	*Pinus edulis* Pinyon	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Chenopodium* Goosefoot	. *Corispermum* Tickseed	*Descurainia* Tansy Mustard	*Portulaca* Purslane	*Cryptantha* Hiddenflower	*cf. Datura* Jimsonweed	*Euphorbia* Spurge	*Sphaeralcea* Globemallow	*Compositae* Sunflower Family	*Leguminosae* Pea Family	*Echinocereus* Hedgehog Cactus	*Opuntia* Prickly Pear	*Zea Mays* Corn	Unidentifiable	No. Taxa	No. Taxa Burned	Actual	Estimated
Site FA 1-2																						
#68	T	N					1/0.7												3	0	1	0.7
Fea. 2, Lev. 1	T	N					1/0.7												3	0	1	0.7
#74																						
Fea. 2, Lev. 2																			0	0	0	0
Site FA 1-5																						
#29	T																					
Hearth	3/1.5*		1/0.5		5/2.5								4/2.0					3/1.5	5	1	16	8.0
Site FA 1-10																						
#3, Hearth						6/12.0													1	0	6	12.0
Site FA 2-6B																						
#21																			0	0	0	0
Site FA 2-8																						
#78, Lev. 1, Fea. 2	9/4.5*																		1	1	9	4.5
#85, Fea. 3, Lev. 1	T																		1	0	+	+
#88, sides/bottom hearth	T																		1	0	+	+
#104, Fea. 3	2/1.0*																		1	1	2	1.0
Site FA 2-17																						
#76	T																					
	1/1.1													1/1.1					2	0	2	2.2

*Some or all items charred. T=twig fragmenets. N=needles. Number above slash indicates actual number of seeds counted; number below slash indicates estimated number of seeds per liter of soil.

Table 14-2. Floatation Results From Site FA 2-16.

	Conifer		Grass		Possible Economic Weeds				Probable Contaminants						Cacti		Cult.				Total Seeds	
	Juniperus Juniper	*Pinus edulis* Pinyon	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Chenopodium* Goosefoot	*Corispermum* Tickseed	*Descurainia* Tansy Mustard	*Portulaca* Purslane	*Cryptantha* Hiddenflower	*cf. Datura* Jimsonweed	*Euphorbia* Spurge	*Sphaeralcea* Globemallow	*Compositae* Sunflower Family	*Leguminosae* Pea Family	*Echinocereus* Hedgehog Cactus	*Opuntia* Prickly Pear	*Zea Mays* Corn	Unidentifiable	No. Taxa	No. Taxa Burned	Actual	Estimated
Site FA2-16																						
#79 West profile					1/0.5						1/0.5						c*	1/0.5	4	1	3	1.5
#80 West profile	14/ 8.2			5/ 2.9	38/ 22.4	1/0.6				1/0.6	3/ 1.8				11/ 6.5				7	0	73	43.0
#81 West profile	T* 1/ 0.6			14/ 12.4	16/ 18.8			2/ 1.8	6/ 7.1	4/ 2.4	19/ 19.4	1/1.2			6/6.5				9	1	69	70.2
#82 Hearth 1, Level 1	1/ .5			1/ 4.0	27/* 135.0		8/ 34.0	17/ 79.0		2/ 1.0	117/ 503.0					1/ 0.5			8	1	1/ 4	757.0
Total estimated seeds	9.3			19.3	176.7	.06	34.0	80.8	7.1	4.0	524.7	1.2			13.0	0.5	+	0.5				871.7
Percent est. seeds	1			2	20	0.1	4	9	1	0.5	60	0.1			1	0.1	+	0.1				
No. of samples (n=4)	3			3	4	1	1	2	1	3	4	1			2	1	1	1				
Percent samples (n=4)	75			75	100	25	25	50	25	75	100	25			50	25	25	25				

*Some or all items charred. T=twig fragments. C=cupule fragments . Number above slash indicates actual number of seeds counted; number below slash indicates estimated number of seeds per liter of soil.

Table 14-3. Floatation Results From Site FA 3-3.

	Conifer		Grass		Possible Economic Weeds				Probable Contaminants						Cacti		Cult.				Total Seeds	
	Juniperus Juniper	*Pinus edulis* Pinyon	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Chenopodium* Goosefoot	*Corispermum* Tickseed	*Descurainia* Tansy Mustard	*Portulaca* Purslane	*Cryptantha* Hiddenflower	cf. *Datura* Jimsonweed	*Euphorbia* Spurge	*Sphaeralcea* Globemallow	*Compositae* Sunflower Family	*Leguminosae* Pea Family	*Echinocereus* Hedgehog Cactus	*Opuntia* Prickly Pear	*Zea Mays* Corn	Unidentifiable	No. Taxa	No. Taxa Burned	Actual	Estimated
Site FA3-3																						
#155 Feat. 1, Level 2	T	N																	2	0	+	+
#160 Fea. 1, Hearth	T																		1	0	+	+
#161 Fea. 1, Hearth																			0	0	0	0
#173 Feature 2	T																		1	0	+	+
#175 Fea. 2, Level 2	T 1/.5				1/ 0.5														2	1	2	1.0
#202 Fea. 5., Level 1	T 1/.5						6/ 4.0						8/ 4.0					4/ 2.0	4	0	19	10.5
#208 Fea. 5, Level 2													1/ 0.5					1	0	1	0.5	
#223 Fea. 3., Level 2	T* 3/1.5								1/ 0.5										2	1	4	2.0
#224 Fea. 3, Level 2																			0	0	0	0 0
#230 Fea. 3, Level 1	T*												1/ 0.5						2	1	1	0.5
#238 Fea. 6, Char. stain	T 2/1.0																		1	0	2	1.0
#306 Fea, 10, Level 1	T																		1	0	+	+

Table 14-3. Floatation Results From Site FA 3-3 (continued).

	Conifer		Grass		Possible Economic Weeds				Probable Contaminants						Cacti		Cult.				Total Seeds	
	Juniperus Juniper	*Pinus edulis* Pinyon	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Chenopodium* Goosefoot	*Corispermum* Tickseed	*Descurainia* Tansy Mustard	*Portulaca* Purslane	*Cryptantha* Hiddenflower	*cf. Datura* Jimsonweed	*Euphorbia* Spurge	*Sphaeralcea* Globemallow	*Compositae* Sunflower Family	*Leguminosae* Pea Family	*Echinocereus* Hedgehog Cactus	*Opuntia* Prickly Pear	*Zea Mays* Corn	Unidentifiable	No. Taxa	No. Taxa Burned	Actual	Estimated
#316 Fea. 10, Level 2																			0	0	0	0
#321 Fea. 9, Level 2	T* 2/1.0																		1	1	2	1.0
#322 Fea. 9, Level 2	T																		1	0	+	+
#345 Str. 2, s. of Fea. 11	T 1/.07																		1	0	1	0.7
#346 Str. 2, s. of Fea. 11	T 2/1.7																	1/ 0.8	2	0	3	2.5
#362 Fea. 4, Level 2	T												2/1.4						2	0	2	1.4
#367 Fea. 4, Level 3																			0	0	0	0
#375 Fea. 4, Level 4	T												1/ 0.8						2	0	1	0.8
#376 Level 1 from stain	* 1/.6																		1	1	1	0.6
#386 Fea. 11, Level 2																			0	0	0	0
#389 Fea. 11, Level 2																			0	0	0	0
#403 Level 2, Light stain							1/	0.7											1	0	1	0.7
#419 Fea. 9, Level 2	T	N 1/0.6													2/ 1.2				3	0	3	1.8
#421 Fea. 9, Level 2																			0	0	0	0

Table 14-3. Floatation Results From Site FA 3-3 (continued).

	Conifer		Grass		Possible Economic Weeds				Probable Contaminants						Cacti		Cult.				Total Seeds	
	Juniperus Juniper	*Pinus edulis* Pinyon	*Oryzopsis* Ricegrass	*Sporobolus* Dropseed	*Chenopodium* Goosefoot	*Corispermum* Tickseed	*Descurainia* Tansy Mustard	*Portulaca* Purslane	*Cryptantha* Hiddenflower	*cf. Datura* Jimsonweed	*Euphorbia* Spurge	*Sphaeralcea* Globemallow	*Compositae* Sunflower Family	*Leguminosae* Pea Family	*Echinocereus* Hedgehog Cactus	*Opuntia* Prickly Pear	*Zea Mays* Corn	Unidentifiable	No. Taxa	No. Taxa Burned	Actual	Estimated
#453 Fea. 6, Level 1	T						4/ 2.0						1/ 0.5						3	0	5	2.5
#505 Fea. 6, Level 1	T																		1	0	+	+
#563 Fea. 7, Level 1																			0	0	0	0
#568 Fea. 7, Level 2																			0	0	0	0
#569 Fea. 7, Level 2	T																		1	0	+	+
#602 Fea. 13, Level 2																			0	0	0	0
#625 Fea. 13, Level 2																			0	0	0	0
#692 Fea. 13, Level 2																			0	0	0	0
#700 Fea. 13, Level 2																			0	0	0	0
Total est. seeds	7.5	0.6			0.5		6.7		0.5				7.7		1.2			2.8				27.5
Percent est. seeds	27	2			2		24		2				28		4			10				99
No. samples (n=35)	20	2			1		3		1				6		1			2				
Percent samples (n=35)	57	6			3		9		3				17		3			6				

*Some or all items charred. T=twig fragments. N=needles. Number above slash indicated actual number of seeds counted; number below slash indicates estimated number of seeds per liter of soil.

Table 14-4. Charcoal Recovered From Sites FA 1-5, 2-8, and 2-16.

FS/Prov.	Unknown	Coniferous				Non-Coniferous			Total
		Juniperus	Pinus edulis	Unknown Conifer	Total Conifer	Populus Salix	Other Unknown	Total Non-Conifer	
FA-1-5									
#29 Hearth		5	12	3	20			—	20
FA 2-8									
#78 Fea. 2, Lev. 1		14	1	5	20			—	20
#85 Fea. 3, Lev. 1		13		7	20			—	20
#104 Fea. 3		18		2	20			—	20
Total No. Pieces for FA 2-8		45	1	14	60			—	60
Percent Pieces		75	2	23	100			—	100
FA 2-16									
#79 west profile	1	7		3	10	8	1	9	20
#82 Hearth 1, Level 1		20			20			—	20
Total No. Pieces for FA 2-16	1	27		3	30	8	1	9	40
Percent Pieces	3	68		8	75	20	3	23	100

Table 14-5. Charcoal Recovered From Site FA 3-3.

FS/Prov.	Unknown	Coniferous				Non-Coniferous			Total
		Juniperus	Pinus edulis	Unknown Conifer	Total Conifer	Populus Salix	Other Unknown	Total Non-Conifer	
#155 Fea. 1, Lev. 2		11	4	5	20			—	20
#160 Fea. 1, hearth		12	4	4	20			—	20
#161 Fea. 1, hearth		15	1	4	20			—	20
#175 Fea.2, Lev. 2		17		3	20			—	20
#223 Fea. 3, Lev. 2	1	8		2	11	9		9	20
#224 Fea. 3, Lev. 2		19		1	20			—	20
#230 Fea. 3, Lev. 1		19		1	20			—	20
#321 Fea. 9, Lev. 2		7	10	3	20			—	20
#322 Fea. 9, Lev. 2		18	2		20			—	20
#367 Fea. 4, Lev. 3		8	5	2	15			—	15
#375 Fea. 4, Lev. 4		17	1	2	20			—	20
#386 Fea. 11, Lev. 2		12	3	5	20			—	20
#419 Fea. 9, Lev. 2		11	6	3	20			—	20
#421 Fea. 9, Lev. 2		7	5	4	16			—	16
#563 Fea. 7, Lev. 1		12	4	4	20			—	20
#568 Fea. 7, Lev. 2		6	11	3	20			—	20
#569 Fea. 7, Lev. 2		13	6	1	20			—	20
#625 Fea.13, Lev. 2		19	-	1	20			—	20
Total No. Pieces		231	62	48	342	9			351
Percent Pieces		66	18	14	97	3			100

found on the site, and their natural debris would be expected to occur frequently in the upper soil strata. Seeds may have been introduced to the hearth interiors while attached to branches used for fuel.

FA 2-16

Test excavations in this small rockshelter revealed some cultural deposits in the lowest stratum. A large number of uncharred weed and grass seeds were recovered from floatation samples (79, 80, 81) taken from the shelter deposits. Although several possibly economic taxa, including dropseed, goosefoot, and hedgehog cactus, were recovered, other taxa lacking economic value (hiddenflower, spurge, jimsonweed) were also retrieved (Table 14-2). Although no rodent disturbance was noted, packrats and other small mammals are notorious rockshelter dwellers and may have collected a large portion of these unburned weeds. Given the protected context however, it may be that some of these taxa are associated with the limited human use of the shelter. A slight prehistoric occupation is indicated by the recovery of a charred corn cupule from the lowest stratigraphic unit (Sample 79); this level also contained juniper and cottonwood/willow charcoal. The presence of both corn and cottonwood/willow charcoal suggests some use of valley areas for resource collection and probably agriculture. Upper shelter strata contained neither charcoal nor burned seeds, although a few charred juniper twigs were found in Sample 81.

A fourth floatation sample was taken from a stained area associated with sherds and lithics some distance (55 m.) from the shelter. This too contained an abundance of unburned weed seeds, as well as charred goosefoot seeds. Goosefoot seeds are the specimens most frequently recovered from archeological contexts, and have been found in both Archaic (Ford 1980, Struever and Knight 1979; Toll 1983) and Anasazi contexts (Adams 1980; Donaldson and Toll 1982). Their frequent recovery attests to their importance as a wild food source for a number of Southwestern groups (Stevenson 1915; Whiting 1939).

FA 2-17

Three loci of scattered lithics comprise this small dune site located in an open pinyon-juniper woodland. A large dispersed charcoal stain in Area 1 (Sample 76) lacked recoverable charcoal but contained a juniper seed, a few twigs, and an unknown legume (Table 14-1). Although the diffuse stain may be the remnant of a hearth, it has lost its original character through erosional processes which also appear to have destroyed any organic contents.

FA 3-3

Floatation samples taken during the initial testing of this early Anasazi habitation site contained very little botanical material (Toll, this volume). Excavation of the pithouse and associated features resulted in the collection of a number of additional samples (Table 14-3). Locus 6 was the core of the site and included the pithouse (Feature 13), a hearth (Feature 5), a possible roasting pit (Feature 7), and a midden area (Feature 6). While sampled pithouse fill contained no identifiable plant remains, unburned juniper twigs and seeds were recovered from the other three features. Unburned weed seeds were also found in the hearth contents. Unburned materials were also common in the other hearths excavated (Features 1, 2, 4, 10, and 11), which also occasionally contained burned juniper seeds. This pattern was also present in two possible roasting pits (Features 3 and 9) situated in different work loci. Charcoal recovered from the floatation samples (Table 14-5) was almost entirely coniferous, with juniper more common than pinyon. Only one sample from Feature 3 (Sample 223) contained nonconiferous charcoal representing a cottonwood/willow type of wood that was probably found along larger washes and in the river valleys.

Altogether, the botanical material from this site yields only limited information about plant resources used during the prehistoric occupation. The numerous hearths and roasting pits suggest that plant processing was a major activity, yet there is little indication of what these plants were. A single possible corn cupule (Toll, this volume) may indicate that cultivars were among the resources being utilized. Charred weed seeds recovered from similar sites (Toll, this volume) suggest that these also were being collected, but no evidence for this was found at FA 3-3. Possible valley resources include the corn and other cultivars, as well as the cottonwood/willow wood used in Feature 3. Exploitation of local resources is best illustrated by the dominance of local fuel sources (pinyon, juniper). The unburned grass and weed seeds represent both economic and noneconomic taxa that are available in the site vicinity today.

Discussion and Conclusions

Botanical material from eight sites in the uplands of the Farmington area were examined in order to recover information about prehistoric plant utilization. More specifically, it was thought that varying exploitation patterns might be evident in the differential distribution of mesa/woodland plant taxa in relation to those from the more distant riverine communities. Ethnographic studies have shown that both hunter-gatherers and agriculturalists travel some distance from their home bases to collect resources or to farm. While habitation sites in the project area may have served as bases for agricultural work in the river valleys, limited activity sites (lithic and artifact scatters) may have had a more specialized function, perhaps focused on the collection of local wild resources.

It was noted that charred plant materials were the most reliable representatives of culturally deposited debris, as unburned organic material usually disintegrates rapidly in open sites. By far the most common taxon recovered was juniper, which was represented by charred and uncharred seeds and twigs. Juniper has long been an important fuel source in the Southwest (Elmore 1944; Whiting 1939), and its berries are collected for consumption during famine years. The high frequency of juniper remains in the floatation samples probably reflects its ubiquity in the Farmington area, and accidental inclusion in prehistoric hearths, rather than the intentional collection of the specimens. Other charred taxa are represented by a single corn cupule and some goosefoot seeds from FA 2-16. Goosefoot appears to have been one of the major wild taxa exploited during the Archaic, and its importance continued even after the adoption of such agricultural staples as corn. Charcoal was commonly recovered from the better preserved contexts and gives a broader picture of resource utilization. Almost all the charcoal examined represented local conifers, with juniper more common than pinyon. In two samples from different sites, cottonwood/willow composed a substantial proportion of the charred wood, and was the only nonconiferous type identified.

Although the recovered material was scanty, it did bear some resemblance to the data collected from other sites in the project area. Toll's studies (this volume) indicated that weedy annuals were collected by the early Anasazi, who probably also farmed in the nearby river valleys. The charred corn and goosefoot seeds recovered from FA 2-16 are reminiscent of this pattern. An abundance of juniper seeds and twigs was noted in all sites excavated. Interestingly, the charcoal from the earlier excavations, although largely coniferous (juniper), tended to include a larger proportion of shrubs and cottonwood/willow.

Variations in the botanical assemblages obtained from different site types are not apparent, although there is a suggestion that local resources were heavily exploited. Information from charcoal shows that fuel sources were generally local, and all the charred weed, grass, and cactus taxa can be collected in the vicinity today. The only remains suggestive of the valley communities are the fragments of corn cobs (assuming that agricultural fields were in the valleys) and cottonwood/willow charcoal.

Acknowledgments

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Chapter 15 • Pollen Analysis of FA 2-13

Linda Scott Cummings

Introduction

Site FA 2-13 is an Archaic or Basketmaker II open campsite located in the Farmington Glade Arroyo System. The site is situated on a stabilized sand dune on the west side of a sandstone cliff. It is in a microecotone between the pinyon and juniper vegetation and the scrub-grassland of the bottome of the Farmington Glade Arroyo where various grasses, sagebrush (Artemisia), rabbitbrush (Chrysothamnus), and snakeweed (Gutierrezia—a high-spine Compositae) predominate. Water is currently available only on a seasonal basis; the nearest permanent water supply is the La Plata River, 2.13 km. to the west. Two pollen samples were taken within a hearth designated Feature 1. A third sample was taken from Feature 3, also a hearth. The fourth sample was taken from a charcoal concentration level elsewhere in the site. Two metates are represented by three metate fragments, which were washed for their pollen content (Table 15-1). Two of the fragments (FS 224 and FS 225) fit together, and so represent a single metate.

Methods

Pollen were extracted from soil samples submitted to Palynological Analysts by the Forest Service. A chemical preparation based on floatation was selected for removal of the pollen from the large volume of sand with which they were mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the floatation process. All samples received a short (5 minutes) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for 3 minutes to remove any extraneous organic matter.

A light microscope was used to count the pollen to a total of 200 pollen grains per sample at a magnification of 600x. Occasionally there was not sufficient pollen to obtain a count of 200 grains; in such cases, a total count of 100 pollen grains was made. Pollen preservation in these samples ranged from fair to excellent. A comparative reference collection was used to identify the pollen to the family, genus, and species level, where possible.

Pollen aggregates were recorded during identification of the pollen. Aggregates are clumps of a single type of pollen, and may represent pollen dispersal over short distances, or the actual introduction of portions of the plant represented into an archeological setting. Aggregates were included in the pollen counts as single grains, as is customary. The presence of aggregates is noted by an "A" above the pollen type on the pollen diagram.

Redeposited pre-Quaternary pollen is frequently noted in studies from western New Mexico (Hall 1977; Gish 1978, 1982). Unique pre-Quaternary palynomorphs signal the possibility that additional pollen from plants that were part of the pre-Quaternary vegetation may be present. The incidence of unique pre-Quaternary pollen in these samples is very low, indicating a low probability for the redeposition of pollen types similar to those of the Quaternary. Therefore, no problems stemming from the redeposition of pre-Quaternary pollen are anticipated in the interpretation of the pollen record from these sites.

Discussion

Four pollen samples were taken from features or cultural material at the site. Three additional samples represent groundstone washes. The two samples taken within Feature 1 contained sufficient pollen for analysis (Fig. 15-1). These samples are very similar to one another, and reflect an environment that supported a large population of Cheno-ams, probably saltbush, low-spine compositae, and apparently lesser quantities of Artemisis (sagebrush) and Graminae (grass) (Table 15-2). Very small quantities of Juniperus and Pinus pollen were noted in these samples. The larger frequency of Ephedra nevadensis pollen observed in FS 329, from the fire-cracked rock concentration, may represent cultural activity. Ephedra is commonly noted to have been used medicinally or as a beverage (Stevenson 1915; Robbins et. al. 1916; Whiting 1939). This sample also contained aggregates of Juniperus, Cheno-am, and low-spine compositae pollen, which may be associated with the local vegetation, or possibly with the use of these resources. Sample 714 represents the charcoal-stained area within Feature 1, and exhibits aggregates of Cheno-am, high-spine compositae, and Graminae pollen. Again, these aggregates may represent the local vegetation. It is also possible, however, that their presence is due to human activity. Cheno-ams have been exploited for both their greens and seeds (Stevenson 1915; Robbins et. al. 1916; Vestal 1952; Bye 1972). The morphological group high-spine compositae includes several plants that have been exploited for their seeds, as herbs, fuel, or for a variety of other purposes (Whiting 1939; Colton 1974). Graminae is noted to have been used as a food (seeds), or for mats and brooms (Robbins et. al. 1916; Cushing 1920; Beaglehole 1937; Whiting 1939; Colton 1974). In addition, Smith (1974) observed that Graminae was used to line hearths and cover foods during baking.

Table 15-1. Proveniences of Pollen Samples From FA 2-13.

Pollen Sample No.	Elevation	Unit	Level	Grid Unit	Comments
224	99.50	6	3	108.20N/103.60E	Metate fragment wash.
225	100.04	6	3	108.30N/103.80E	Metate fragment wash (fits with FS 224).
317	99.91	5	3	109.95N/104.50E	Metate fragment wash.
329	100.05-	7	F.1	108.03N/104.57E	Feature 1, Occupation level, fire-cracked rock.
373	100.10	14	5	109.93N	Charcoal concentration level, insufficient pollen.
714	100.02-	20	F.1	107.97N/104.53E	Charcoal stain.
769	100.03-	35	5	111.05N/104.15E	Feat. 3, possible hearth, insufficient pollen.

Table 15-2. Pollen Types Observed at FA 2-13.

Scientific Name	Common Name
ARBOREAL POLLEN	
Juniperus	Juniper
Pinus	Pine
Quercus	Oak
NON-ARBOREAL POLLEN	
Cheno-ams	Amaranth or pigweed, and members of the goosefoot family
Compositae	Sunflower family
Artemisia	Sagebrush
Low-spine	Includes ragweed, cockle-bur, etc.
High-spine	Includes sunflower, rabbitbrush, snakeweed, etc.
Liguliflorae	Includes dandelion and chickory
Cruciferae	Mustard family
Ephedra	Navajo tea
Eriogonum	Buckwheat
Graminae	Grass family
Onagraceae	Primrose family
Phlox	Phlox
Sphaeralcea	Globe mallow

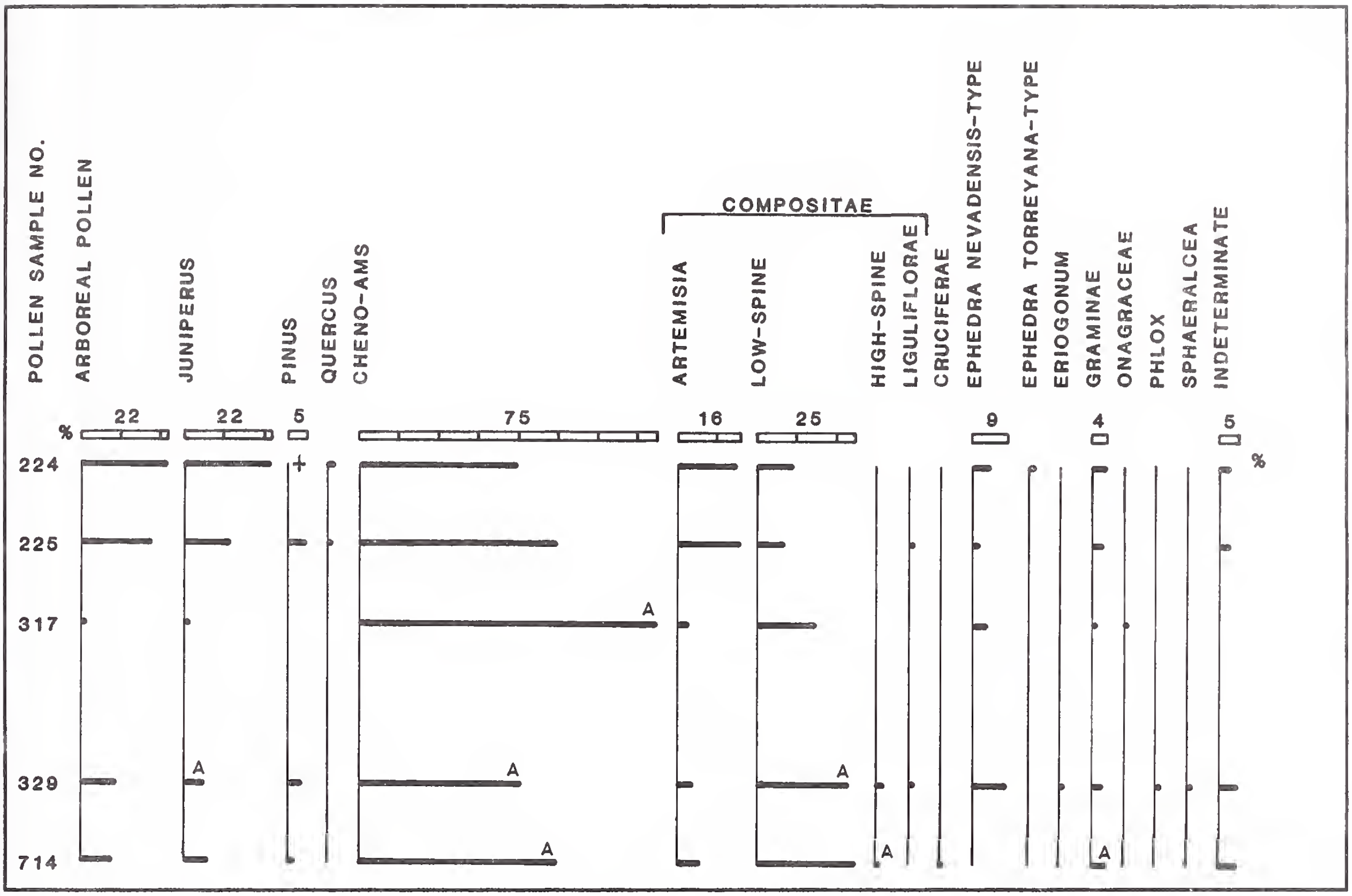

Figure 15-1. Pollen diagram for Site FA 2-13.

Pollen samples taken from a charcoal concentration (FS 373), and within Feature 3, a possible hearth (FS 769), did not contain sufficient pollen for analysis.

Three pollen washes came from two metates. One metate had been broken into two pieces, and each piece washed separately. The two samples from different fragments of the same metate are very similar to one another in pollen content. They both yielded Juniperus pollen in considerably larger frequencies than are observed in other samples from this site. The Pinus quantities, however, are similar to other samples. This may indicate grinding Juniperus on this metate. Gallagher (1977) notes that juniper berries were an important food source for the Apache. The berries were eaten fresh, boiled, pounded to form a kind of bread, or soaked and pounded to make a liquid drink. Smith (1974) reports that the Northern Utes rubbed juniper berries with a mano to separate the seeds from the pulp, which was then either eaten fresh or dried and ground on a metate. Elevated Juniperus frequencies were also noted in both mano and metate washes in northern Colorado (Scott Cummings 1981). In addition, an experimental wash of juniper berries yielded Juniperus pollen, indicating that it is possible to introduce this pollen through the utilization of the fruit (Gish and Scott Cummings 1983).

This metate also displays more Artemisia pollen than other samples from the site, and this may indicate grinding of Artemisia seeds. Stevenson (1915) notes that the Zuni ground Artemisia seeds into meal, which was then mixed with water to form balls or pats, and steamed. The Zuni maintain that this is among their most ancient foods. A slightly elevated Artemisia frequency on a mano from an Archaic deposit in Utah (Scott Cummings 1983) has also been interpreted as indicating the grinding of Artemisia seeds.

The other metate wash (FS 317) contained a very high frequency of Cheno-am pollen (75%), and an aggregate of Cheno-am pollen, which probably indicates grinding of Cheno-am seeds. Numerous aboriginal groups ground Cheno-am seeds (primarily Chenopodium and Amaranthus, but also including Atriplex) into flour

(Stevenson 1915; Robbins et al. 1916; Vestal 1952; Bye 1972).

Summary and Conclusions

The pollen record of the paleoenvironment, as reflected in samples taken within Feature 1, appears to be similar to that described for the present. Subsistence, as reflected in samples from two separate metates, a fire-cracked rock concentration, and a charcoal stain, appears to be typical of the Archaic lifestyle. Elevated Juniperus and Artemisia pollen frequencies on two fragments of the same metate point to the likelihood that juniper berries and sagebrush seeds were ground. The very large frequency of Cheno-am pollen on the other metate indicates that Cheno-am seeds were probably ground into flour. The higher than average quantity of Ephedra nevadensis-type pollen, and the presence of aggregates of Juniperus and Cheno-am pollen in the fire-cracked rock concentration, may also indicate use of these resources at the site. In addition, the presence of aggregates of Cheno-am, high-spine compositae, and Graminae pollen in the charcoal stain of Feature 1 may also be connected with exploitation of these resources.

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Chapter 16 • Pollen Analysis at FA 3-6, FA 1-6, FA 3-3, and FA 2-8

Linda Scott Cummings

Introduction

Excavation of four archeological site within the project area yielded pollen samples which were analyzed to assist in the interpretation of these sites. This pollen analysis will concern itself with both paleoenvironmental and subsistence data. These sites, FA 3-6, 1-6, 3-3, and 2-8, have been described elsewhere in this volume.

Methods

Pollen was extracted from soil samples submitted by the Forest Service. A chemical preparation based on floatation was selected for removal of the pollen from the large volume of sand with which they were mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the floatation process. All samples received a short (five minute) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for three minutes to remove any extraneous organic matter.

A light microscope was used to count the pollen to a total of 200 pollen grains per sample at a magnification of 600x. Occasionally there was not sufficient pollen to obtain a count of 200 grains. In these cases a total of 100 pollen grains was counted. Pollen preservation in these samples was fair to excellent. A comparative reference collection was used to identify the pollen to the family, genus, and species level, where possible.

Pollen aggregates were recorded during identification of the pollen. Aggregates are clumps of a single type of pollen, and may be interpreted to represent pollen dispersal over short distances, or the actual introduction of portions of the plant represented into an archeological setting. Aggregates were included in the pollen counts as single grains, as is customary. The presence of aggregates is noted by an "A" above the pollen type on the pollen diagram.

Redeposited prequaternary pollen is frequently noted in studies from western New Mexico (Hall 1977; Gish 1978, 1982). Unique prequaternary palynomorphs signal the possibility that additional pollen from plants that were part of both the prequaternary and quaternary vegetation may be present. The incidence of unique prequaternary pollen in these samples is very low, indicating a low probability for the redeposition of pollen types similar to those of quaternary pollen. Therefore, no problems stemming from the redeposition of prequaternary pollen are anticipated in the interpretation of the pollen record from these sites.

Discussion

The pollen will be discussed for each site individually, in order to facilitate interpretation of the data on a site-by-site basis. Intersite comparisons will be made in the SUMMARY AND CONCLUSIONS section.

FA 3-6

This site is located on a sand dune in a flat valley with gradual slopes and a shallow, sandy stream channel. An intermittent stream runs approximately 350 m. from the site, and empties into the San Juan River. Several small washes also cut the site. Rolling hills and small sandstone bluffs are located to the east and south of the site and lead to the floodplain of the San Juan River, which is approximately 3 km. south. The vegetation at the site is typical of a juniper association and includes Juniperus (juniper), Ephedra (mormon tea), Opuntia (prickly pear cactus), Yucca (yucca), Gutierrezia (snakeweed), Chrysothamnus (rabbitbrush), Purshia (antelope bitterbrush), Artemisia filifolia (sand sage), Eriogonum (buckwheat), Cleome lutea (yellow beeplant), Mirabilis (four o'clock), and various assorted grasses and forbs. The vegetation near the stream channel is predominantly sagebrush and rabbitbrush. Radiocarbon dates obtained from Locus 1 at this site range from A.D. 618 to 1005 (Feature 4) (Raish, this volume). Root and rodent disturbance were common.

The pollen record from this site contains abundant evidence of the local vegetation. A large quantity of juniper pollen is noted in the sample from the present ground surface, which also exhibits evidence of aggregates of juniper pollen. Moderately large frequencies of juniper pollen persist throughout the archeological samples from this site, as do the aggregates of this pollen type. This is probably due to the presence of juniper in the immediate vicinity. Juniper has been widely used as a food source, and for medicine, fuel, and construction (Stevenson 1915; Robbins et al. 1916; Cushing 1920; Beaglehole 1937; Whiting 1939; Colton 1974). It is possible that utilization of juniper at this site is responsible for the deposition of some of the juniper pollen. The large quantity of Juniperus pollen within the present ground surface, as well as the presence of aggregates in that sample, indicate that the total deposition of Juniperus pollen within this site may be attributable to wind deposition of the pollen from junipers near the site. The pollen record at this site indicates that the components of the biotic community have not fluctuated significantly between the period of occupation and the present.

Cheno-am pollen is represented by moderately large frequencies throughout the samples in Locus 1 (Table 16-1, Fig. 16-1). These frequencies of Cheno-ams are considerably larger than that exhibited on the present ground surface, and also contain evidence of aggregates of Cheno-am pollen in all of the samples from ash pits and ash stains. No Cheno-am aggregates were observed in the two samples taken below ash stains and fire-cracked rocks. It is therefore probable that Cheno-ams were utilized as a food in Locus 1 at this site. In Locus 2 the frequency of Cheno-am pollen is relatively low, although aggregates were observed in the sample taken from the stained area, but not from the non-stained area. It is likely that this reflects the utilization of Cheno-ams in Locus 2, as well as in Locus 1. Aggregates of Artemisia and Low-spine Compositae pollen (Table 16-2) were also noted in several samples from this site. These aggregates appear in samples taken within the features, as well as from samples taken below the features, and are therefore probably indicative of the natural vegetation in the vicinity of the site rather than the utilization of these plants. A single tetrad of Typha latifolia was observed in sample #645 from a stained area in Locus 2. It is possible that cattail was used, having been prepared in a hearth represented now only as a stained area.

Pollen evidence of numerous edible plants indicates that the occupants of the site could have used a variety of nearby wild foods. The pollen frequencies, however, do not conclusively indicate utilization at the site. In addition to the Juniperus and Cheno-ams already mentioned, High-spine Compositae, Cruciferae, Ephedra, Graminae, Shepherdia, and Sphaeralcea were available. No evidence of cultigens is present within the pollen records at this site.

FA 1-6

This site is an Anasazi site that yielded radiocarbon dates which range from A.D. 15 to A.D. 1350 (Raish, this volume). The wide range of radiocarbon dates from this site indicates several occupations. The site is located on the southeast side of Hood Mesa above the Animas Valley. Alluvial and colluvial deposits at the site are cut by several washes, which drain into Porter Arroyo to the southeast. Porter Arroyo itself drains into the Animas River approximately 5 km. south. The vegetation at the site is comprised of Pinus edulis (pinyon pine), Juniperus (juniper), Ephedra (ephedra), Purshia (bitterbrush), Artemisia (sagebrush), and miscellaneous forbs. The pollen counts from the site are shown in Fig. 16-1.

A stratigraphic pollen column was taken from the fill within Feature 3, a pitstructure (Table 16-3). A small sandstone slab storage structure, designated Feature 4, was adjacent. Feature 4 was roughly rectangular and contained a stone alignment down the center dividing it into two sections. Pollen samples were taken from both sections within this feature. A sample was also taken from the east half of the mealing bin/storage area immediately above a metate. The trough of another metate recovered approximately 1.1 m. north of the structure was also sampled for pollen. It was located 16 cm. below the present ground surface, trough up. Some charred corn fragments were noted in the fill above that metate. The midden area (F.6) outside the structure was also sampled for its pollen content in an effort to recover subsistence data. Feature 7, an ash pit outside the structure, was also sampled to assist in defining subsistence at the site. A charcoal concentration designated as a probable burn area was located approximately 8 m. west of the structure, and was sampled for pollen to assist in its interpretation.

The sample representing the present ground surface was taken during March or April, which is during or immediately after the pollination period for Pinus and Juniperus. As expected, the arboreal pollen frequency is extremely high in this sample, with a large quantity of Juniperus pollen and a relatively large quantity of Pinus pollen present. Both juniper and pine pollen exhibited aggregates within the present ground surface sample. The nonarboreal pollen types were underrepresented in this sample due to the overrepresentation of pine and juniper pollen, which appear to have been pollinating when the sample was taken.

The stratigraphic column taken within Feature 3 (the pitstructure) exhibits a considerable amount of variation within the pollen record. The arboreal pollen in general, and the Juniperus pollen frequency in particular, are low in samples from the top of the column and also from the bottom of the column at the south wall. The frequencies are considerably higher on the west wall from the bottom of the column to almost half way up (40 to 28 cm.). Aggregates of juniper pollen we are noted in samples 184, 185, and 181, which represent depths from 28-40 cm. below the present ground surface.

Cheno-am pollen fluctuates in opposition to the Juniperus pollen in the stratigraphic column at this site. Larger quantities of Cheno-am pollen were noted in the uppermost samples from this column, as well as the bottom sample from the south wall. Slightly lower frequencies of Cheno-am pollen were noted in the samples where Juniperus pollen was high. All of the samples from this stratigraphic column contained aggregates of Cheno-am pollen. Zea pollen was noted during scanning

Table 16-1. Proveniences of Pollen Samples From FA 3-6.

Sample No.	Feature No.	Locus No.	Depth In CM Below PGS	Provenience
FA3-6				
242		1	0	Pinch sample over present ground surface.
719	5	1	7	Ash sand level of subsurface ash pit; rodent disturbance.
732	4	1		Probable deflated hearth, ash concentration, rodent disturbance.
747	4	1		Black flecked hard compact sand level below ash stained, fire-reddened area; rodent disturbance.
524		1	2-10	General ash stain and fire-cracked rock 3 m northeast of F. 4; root and rodent disturbance.
534		1	14-17	Immediately below ash stain and fire-cracked rock, 3 m northeast of F. 4; root and rodent disturbance.
553		1	12	General ash stain and fire-cracked rock; light charcoal flecking; rodent disturbance.
218		1	10	General ash stain and fire-cracked rock, 2 m from F. 4.
645	1	2	15	Surface lithic and fire-cracked rock scatter, gray-stained area.
647	1	2	16	Surface lithic and fire-cracked rock scatter, non-stained area.

of several samples from this stratigraphic column, including the uppermost layers, as well as the sample from the bottom of the west wall. The presence of Zea pollen within these samples indicates that the fill within the structure may be culturally affiliated trash. The aggregates of Cheno-am pollen may result from the growth of Cheno-ams in the accumulating fill of the structure after it had been abandoned, since Cheno-ams frequently grow in disturbed areas (Clary and Cully 1979). It is also possible that the increased quantity of Cheno-am pollen, as well as the aggregates of Cheno-am pollen within these samples, is the result of the discarding of economic waste materials, such as appears to be the case with the Zea pollen. Likewise the aggregates of Juniperus pollen represented within samples in this stratigraphic column are more probably the result of natural distribution of these pollen types from juniper in the immediate vicinity. The possibility should not be ruled out, however, that the juniper aggregates and high frequencies within these samples may have been derived from culturally-associated trash. A sample of unknown depth from the fill of this structure most resembles the samples taken from the central to lower depths within the stratigraphic column from the west wall, from depths of 28 to 40 cm.

Two other pollen samples were taken within the structure, and include samples 328 from the bedrock floor in the northwest quadrant of the structure, which has a radiocarbon date of A.D. 608+48, and sample 345 from the interior hearth or ash dump in the southeast quadrant of the structure, which was radiocarbon dated to A.D. 440±190 (Raish, this volume). Sample 328 from the floor of the structure displays aggregates of Juniperus and Pinus pollen, as well as Cheno-ams, Cleome, and Zea. It is highly likely that aggregates of pollen within a structure denote the utilization of or presence of portions of the plant represented by that pollen type. Cheno-ams, Cleome, and Zea were probably all food items used by the occupants of this structure. The aggregates of Juniperus and Pinus pollen within this floor sample are probably also indicative of the utilization of portions of these trees, possibly as fuel or construction materials.

Sample 345 from the hearth or ash dump within this structure contains a very large quantity of Cheno-am pollen, as well as a large number of aggregates of this pollen type. This indicates cooking of Cheno-ams in the structure. The high concentration of Cheno-am pollen within this feature suggests that it was a hearth rather than an ash dump. Pollen resulting from the spillage of food items is frequently recoverable from hearth fill, but samples that are primarily ash and have been removed from hearths have frequently been burned at a sufficiently high temperature to destroy most of the pollen types originally present in the hearth. Other pollen frequencies within this sample appear to be depressed by the large quantity of Cheno-am pollen. The low frequency of Juniperus pollen within this sample may actually have economic significance, as aggregates of this pollen type were present. It is possible that juniper was used either as a fuel or prepared as a food within this possible hearth.

Four samples were taken from the small storage area adjacent to the structure. Samples 175 and 176 were taken from the upper portion of the fill within this feature. Sample 175 contains large quantities of both Juniperus and Pinus pollen. The probability for contamination of this sample with recent spring time pollen is high, since the sample was taken 2-3 cm. below the present ground surface. The pollen in this sample looks very fresh, as one would expect from a present ground surface sample. Sample 176 was taken 23 cm. below the present ground surface. This sample contains much less pine and juniper pollen. A very large quantity of Cheno-am pollen was noted in this sample, as were a large number of aggregates of Cheno-am pollen. Due to the fact that this sample was taken relatively high in the feature fill the presence of large quantities of Cheno-am pollen and aggregates probably relates either to the growth of Cheno-ams within the disturbed soil filling the feature after its abandonment, or to the discarding of cultural trash within this feature by occupants of another section of this site or a nearby site. Pollen sample 352 was taken in the west half of the mealing bin/storage pit approximately 25-35 cm. below the present ground surface. This sample also represents post-occupational fill of the feature since the bedrock floor of the feature is located 70 cm. below the present ground surface. Aggregates of Juniperus, Cheno-am and Artemisia pollen within this sample may represent the growth of these plants in the immediate vicinity of this feature, or the disposal of cultural trash in the fill of the feature. Sample 354 was taken approximately 3-4 cm. below the present ground surface in the east half of this feature immediately above a metate. Aggregates of both Juniperus and Cheno-am pollen were noted in this sample. Aggregates of these pollen types are common within the general fill of this feature, and are probably derived from the same source within this sample as for the other samples. They are apparently not related to the utilization of the metate located below the sample. A small quantity of Zea pollen was noted in this sample, indicating that cultural waste was deposited in the fill of this feature.

Sample 281 was taken from the fill inside a metate through approximately 1.1 m. north of the structure. The metate was found 16 cm. below the present ground surface with the trough up. The sample contains a very large quantity of Cheno-am pollen, as well as a large quantity of aggregates of Cheno-am pollen. From the pollen evidence it appears that this metate was used to grind Cheno-am seeds.

The midden area designated Feature 6 outside the structure was radiocarbon dated to A.D. 755+135 and 903±128 (Raish, this volume). Sample 385 contained aggregates of both Juniperus and Cheno-am pollen, which may be from the presence of a juniper on or near the site and the growth of Cheno-ams in the disturbed soil of the midden. It is also possible that these aggregates may have resulted from the disposal of cultural material in the midden.

Sample 428 was taken from the southwest quadrant of an ash pit (F. 70 located 2.5 m. from the structure. This ash pit was radiocarbon dated to A.D. 1350+290, and contained a large quantity of both Cheno-am pollen and aggregates of Cheno-am pollen. It appears, therefore, that Cheno-ams were cooked within this feature. It should also be noted that this pit contained charcoal, fire-cracked rock, and lithics. The large juniper tree growing in a portion of this feature apparently has not affected the pollen record.

Sample 145 was taken from the southeast corner of a charcoal concentration approximately 8 m. south of the structure. Aggregates of Juniperus, Pinus, and low-spine Compositae pollen were noted within this sample. It is possible that pine and juniper may have been burned in this context, but the pollen from this sample does not definitively indicate the function of this feature.

Sample 179 was taken from a charcoal stain 2 m. east of the structure and contained aggregates of Juniperus, Cheno-am, and Graminae pollen. Like many other features and sediments from this site, the Juniperus and Cheno-am aggregates in this sample may be the result of the growth of these plants near the feature. The presence of an aggregate of Graminae pollen, however, is unique in this sample. It is possible that the presence

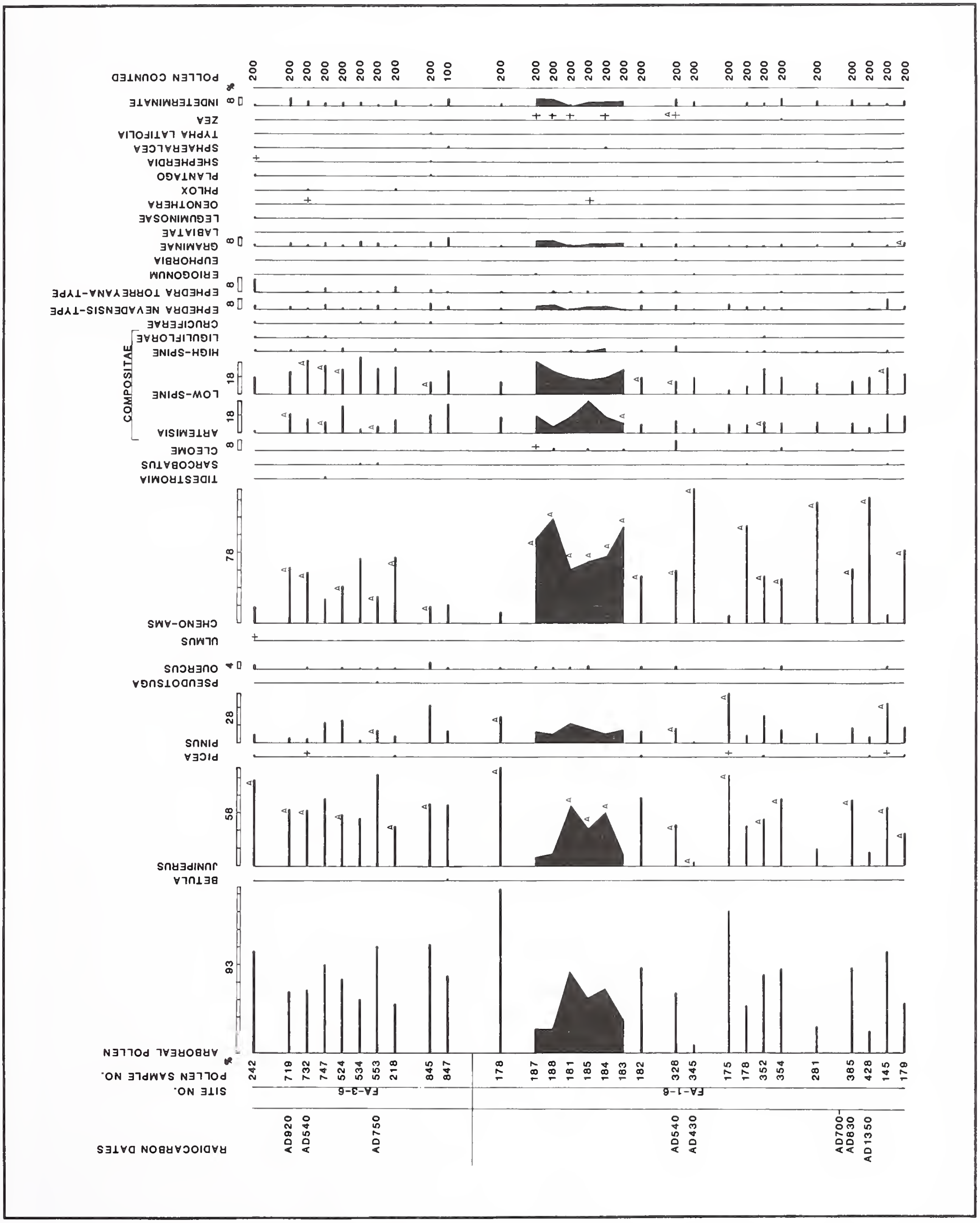

Figure 16-1. Pollen diagrams for sites FA 3-6 and FA 1-6.

Table 16-2. Pollen Types Observed at FA 3-6, FA 1-6, FA 3-3, and FA 2-8.

Scientific Name	Common Name
Arboreal Pollen	
Betula	Birch
Juniperus	Juniper
Picea	Spruce
Pinus	Pine
Pseudotsuga	Douglas-fir
Quercus	Oak
Ulmus	Elm
Non-Arboreal Pollen	
Boerhaavia	Spiderling
Cheno-ams	Members of the goosefoot family and pigweed.
Sarcobatus	Greasewood
Tidestromia	Tidestromia
Cleome	Beeweed or Beeplant
Compositae	Sunflower family
Artemisia	Sagebrush
Low-spine	Members of the sunflower family, including ragweed, bur-weed etc.
High-spine	Members of the sunflower family, including rabbitbrush, snake-weed, sunflower, etc.
Liguliflorae	Members of the sunflower family, including dandelion and chickory.
Cruciferae	Mustard family
Cyperaceae	Sedge family
Ephedra	Mormon tea
Eriogonum	Buckwheat
Euphorbia	Spurge
Graminae	Grass family
Labiatae	Mint family
Leguminosae	Legume or pea family
Oenothera	Evening primrose
Opuntia	Pricklypear cactus
Cylindropuntia	Cholla cactus
Phlox	Phlox
Plantago	Plantain
Sphaeralcea	Globe mallow
Typha	Cattail
Zea	Maize, corn

of an aggregate of grass pollen in this sample is indicative of cultural activity, such as parching of grass seeds or use of grass to line the feature or cover foods being roasted.

The pollen record from this site indicates that juniper is an abundant element of the environment. Aggregates occur in features where it may have been used as a fuel and also in the fill of the mealing bin/storage area, where its presence is most likely due to natural distribution of the pollen. Cheno-ams appear to have colonized disturbed areas, such as the structure and mealing bin/storage area as they filled following abandonment. In addition, large quantities of Cheno-am pollen and aggregates were noted in the structure hearth, indicating that such plants were exploited as a food. Other plants which appear, from the pollen record, to have been exploited for food at this site include Cleome and possibly Graminae and Sphaeralcea. The evidence for utilization of Zea at this site is derived from both the floor of the structure and post occupation fill of the structure and mealing bin/storage area. This appears to indicate at least some utilization of this cultigen at the site over a period of time.

FA 3-3

Ceramics noted at this site indicate that at least certain components of the site date between A.D. 900 and 1300. Radiocarbon dates range from 805 B.C.±415 to A.D. 1350±65 (Raish, this volume). The site is located on colluvial deposits eroding from sandstone cliffs; these latter form a semicircle around the northern perimeter of the site. The deposits appear to be mixed alluvium, colluvium, and aeolian sediments. The site is located in a dissected mesa area on top of Hood Mesa. Shallow, intermittent streams cross the site, which drain into a tributary of the Wyper Arroyo, which itself drains into the Animas River approximately 4 km. south-southeast of the site. The local vegetation is comprised of Pinus edulis (pinyon pine), Juniperus (juniper), Cercocarpus (hairy mountain mahogany), Ferocactus (small barrel cactus), Opuntia (prickly pear), Chrysothamnus (rabbitbrush), Purshia (antelope bitterbrush), Quercus (gambel oak), Artemisia (sagebrush), Gutierrezia (snakeweed), Lupinus (lupine), Ephedra (mormon tea), Yucca (narrow- and broadleafed yucca), Agropyron (crested wheat grass), Oryzopsis (Indian rice grass), and various assorted grasses and forbs. The pollen counts from the site are shown in Fig. 16-2.

The site consists of a pitstructure, three presumed roasting pits, three cobble ring hearths, four hearths with no associated cobbles, and an ash/fire-cracked rock dump area. These features are located throughout a 160 by 50 m. area against a sandstone outcrop (Raish, this volume). Several samples were taken within the pithouse on the floor, from the central hearth, below the rooffall/wallfall, and from the fill of a posthole. The roasting pits and hearths noted at this site were sampled for the purpose of gathering subsistence data. Several of the samples from this site did not contain sufficient pollen for analysis (samples 696, 236, 374, 424, 422, 164, and 165).

A series of samples from the pithouse were taken to provide economic data (Table 16-4). Sample 689 from the fill of the central hearth in the pithouse displays a high frequency of Juniperus pollen, as well as aggregates of this pollen type. It also displays aggregates of Graminae pollen, as well as a single Opuntia pollen grain noted during the scanning of the sample. It is possible that Juniperus was used as a fuel within this hearth, and that grass seeds were parched and Opuntia possibly prepared (spines removed from the pads) or cooked within the hearth. Sample 617 was taken from the floor of the pithouse immediately south of the hearth. This sample also contained a large quantity of Juniperus pollen, as well as a few aggregates of this pollen type. No aggregates of Graminae pollen and no Opuntia pollen were noted from this sample. It is possible that the large quantity and aggregates of Juniperus pollen within this sample is due to the use of juniper as a fuel in the hearth. Sample 603 was taken against the east wall of the pithouse within 5 cm. of the bedrock floor. Sample 677 was removed from the fill of a posthole at the southwest edge of the structure. The pollen record in both of these samples is largely unremarkable and contains little evidence of use of vegetal materials within the pithouse. A single grain of large grass pollen was noted within the fill of the posthole. Morphologically this grass pollen is similar to that of Oryzopsis, or Indian rice grass, which grows at the site today.

Samples 454 and 522 were taken from the midden (F. 6). Sample 454 contained aggregates of Cheno-am and low-spine Compositae, which may indicate growth of these plants in the disturbed soils of the midden, or possibly discard in the cultural refuse. Sample 522 is largely unremarkable in its pollen content. Sample 207 was taken in a cobble-ring hearth (F. 5), which was located adjacent to the northeast edge of the midden. There is no evidence in this sample to indicate economic utilization of plants.

Samples 212 and 213 were taken from a slab-lined roasting pit (F. 3). A basin-shaped, unlined hearth (F. 11) was located below Feature 3 and sampled for pollen (samples 388 and 391). The living-surface level associated with Feature 11 is represented in sample 349, and a possible living surface below Feature 11 is represented in sample 467. The pollen record from this group of samples exhibits aggregates of Juniperus pollen in both samples taken from the slab-lined roasting pit (samples 212 and 213), in the sample from the bottom of the basin-shaped, unlined hearth (sample 391), and from the living surface associated with that feature (sample 349). In addition, the slab-lined roasting pit (samples 212 and 213) contained aggregates of Cheno-am, Artemisia, low-spine Compositae, and Graminae pollen. It is possible that some of these aggregates represent local plants. The possibility that these pollen aggregates represent native use should not be overlooked. Juniperus may have been utilized as a fuel, and Cheno-ams and Graminae may well have been cooked in the hearth. It is also possible that portions of sagebrush and various low-spine composites were utilized or cooked for food. Aggregates of Graminae pollen have been rarely noted in this study, and are considered to indicate the use of this resource. Grass seeds are a highly nutritious food. In addition, sample 213 from the west half of the roasting pit contained a single grain of Shepherdia pollen, which occurs only rarely at these sites. It is possible that the presence of Shepherdia pollen in this feature represents the use of buffalo berries.

The pollen sample taken from the bottom of the basin-shaped, unlined hearth contains a large number of aggregates of Juniperus pollen; these were not noted in the upper fill of this feature. It also contains aggregates of Quercus pollen, and Cylindropuntia pollen was observed during the scan of this sample. It appears from the comparison of the upper and lower fills of this feature that juniper and oak may have been used as fuel within it. It is possible that Cylindropuntia (cholla cactus) was cooked in the hearth. Pollen sample 349 taken from the living surface associated with the basin-shaped, unlined hearth contained aggregates of Juniperus and Cheno-am pollen, which may indicate plants growing in the immediate vicinity or use of these plants. Sample 467, taken from a lower living surface, contained aggregates of low spine composite pollen, which may indicate disturbance of the environment at the site, or possibly use of a member of this group of plants.

Sample 366, taken from a cobble-ring hearth, exhibited aggregates of Juniperus, Cheno-am, Tidestromia, and Graminae pollen. It is likely that Juniperus was used as a fuel, and that cheno-ams, including Tidestromia, as well as grasses and possibly Opuntia, were cooked within the hearth. It is possible that the Cheno-ams and grasses in this sample were used as accessories during the roasting or cooking of Opuntia. Greenhouse et al. (1981), in a study of cholla bud roasting pits, note that a member of the Cheno-am family (Suaeda) is used to line the roasting pits, which held the cholla buds. While the evidence in this sample is not definitive for such a use, it is a possibility that should be considered. It is also interesting to note that Zea pollen was found in the scan of the sample. This indicates access to cultigens at the site and the cooking of corn in this feature. The sample taken beneath a bottom cobble in this hearth (sample 374) did not contain sufficient pollen for analysis.

Sample 314 was taken in a possible hearth or ash dump (F. 10), while sample 404 was taken from a stain area associated with Feature 10. Both of these samples exhibited large quantities of Juniperus pollen, as well as aggregates of this pollen type. The sample from the possible hearth also yielded aggregates of Cheno-am pollen. It is possible that these aggregates indicate use of these plants within the possible hearth.

Sample 177 was taken from a hearth (F. 2) in the ash level. No prehistoric artifacts were noted in association with this feature, but shotgun shells were found within 1 m. of the hearth. It is therefore possible that this feature may be modern (Carol Raish, personal communication). The only pollens within this sample that indicate possible use of vegetal material are the aggregates of Juniperus pollen, indicating that juniper may have been used as a fuel.

The four samples taken within the pithouse at this site exhibit aggregates of Juniperus and Graminae pollen. It is unlikely that aggregates of the local pollen would be introduced into the pithouse by natural means, such as wind distribution (Scott Cummings 1983). It is, therefore, likely that these aggregates indicate native use.

Numerous samples from hearths and roasting pits were analyzed from this site. The majority of samples from this type of provenience yielded aggregates of Juniperus pollen, indicating probable use of juniper, perhaps as a fuel. Aggregates of Cheno-am pollen were present from the midden, roasting pit, the living surface associated with the hearth, and two hearth samples. It appears from this distribution that Cheno-ams were utilized as a food source at this site. Very few aggregates of low-spine Compositae and Artemisia were noted in samples from this site. It is probable that their presence is related to the natural distribution of this pollen from the plants in the immediate vicinity of the site. Aggregates of Graminae pollen were noted in one roasting pit and two hearth samples. It is probable that these aggregates indicate the roasting of grass seeds or the use of grass for other purposes in the roasting pits. Opuntia pollen was noted in two hearths, and Cylindropuntia pollen was noted in a third. It is likely that the presence of these cactus pollen within the hearths came from cooking the plants as food. A single grain of Shepherdia pollen was also noted in a roasting pit sample, indicating the possibility that buffalo berries also were used as food.

Table 16-3. Proveniences of Pollen Samples From FA 1-6.

Sample No.	Feature No.	Locus No.	Depth in CM Below PGS[1]	Provenience
FA1-6				
178			0	Pinch sample taken off-site, March/April.
187	3		15	West wall of strat column; F. 3 is an upright slab-base circular structure.
186	3		25	West wall, strat column.
181	3		28-30	West wall, strat column.
185	3		30-35	West wall, strat column.
184	3		35-40	West wall, strat column.
183	3		35-40	South wall, strat column.
182	3			General fill, depth unkown.
328	3		27-32	NW quad, dispersed sample immediately above bedrock floor.
345	5			SE quad, dark ash stain, probable interior hearth or ash dump.
175	4		2-3	Small mealing bin/storage area.
176	4		2-3	Small mealing bin/storage area, east side of stone alignment, upper fill.
352	4		25-35	Small mealing bin/storage area, west 1/2, sandy fill.
354	4		3-4	Small mealing bin/storage area, east 1/2, immediately above in situ metate.
281			16	Inside metate trough, located 1.1 m north of structure, trough up.
385	6		16	Midden area outside structure, ash and charcoal flecks present, 1 m north of F. 4, root disturbance.
428	7		34-38	SW quad of ash pit 2.5 m from structure.
145			15	SE corner of charcoal concentration located 8 m west of structure, probable burn area, dark stain.
177			25	NW corner of charcoal concentration (same as sample 145), insufficient pollen.
179			10-20	Charcoal stain 2 m east and downslope from the structure.

[1] Present ground surface.

FA 2-8

This site has been tested, but not entirely excavated. The site is locate within and adjacent to a wash, which has caused a large portion of it to be eroded away. The vegetation in the vicinity of the site includes Pinus (pinyon pine), Juniperus (juniper), and Ephedra (mormon tea). The site is located immediately north of a ridge at an elevation of 5830 feet The site itself consists of several charcoal-stained areas and ceramic and lithic scatters, including both chipped and ground stone. Testing indicated that the stained areas represent subsurface hearths. Two of the charcoal-stained areas were sampled for pollen in an effort to provide subsistence data. No dates are available at present.

Sample 88 was taken from a hearth fill and sample 103 from a charcoal concentration (Table 16-5; Fig. 16-2). Sample 88 from the hearth fill contained a large quantity of Artemisia pollen, as well as numerous aggregates of this pollen type. In addition, aggregates of high-spine Compositae were noted, and Zea was present in the scan of the sample. Cleome pollen was also present (1% of the total pollen). The presence of these pollen types and aggregates within this sample is probably from use of

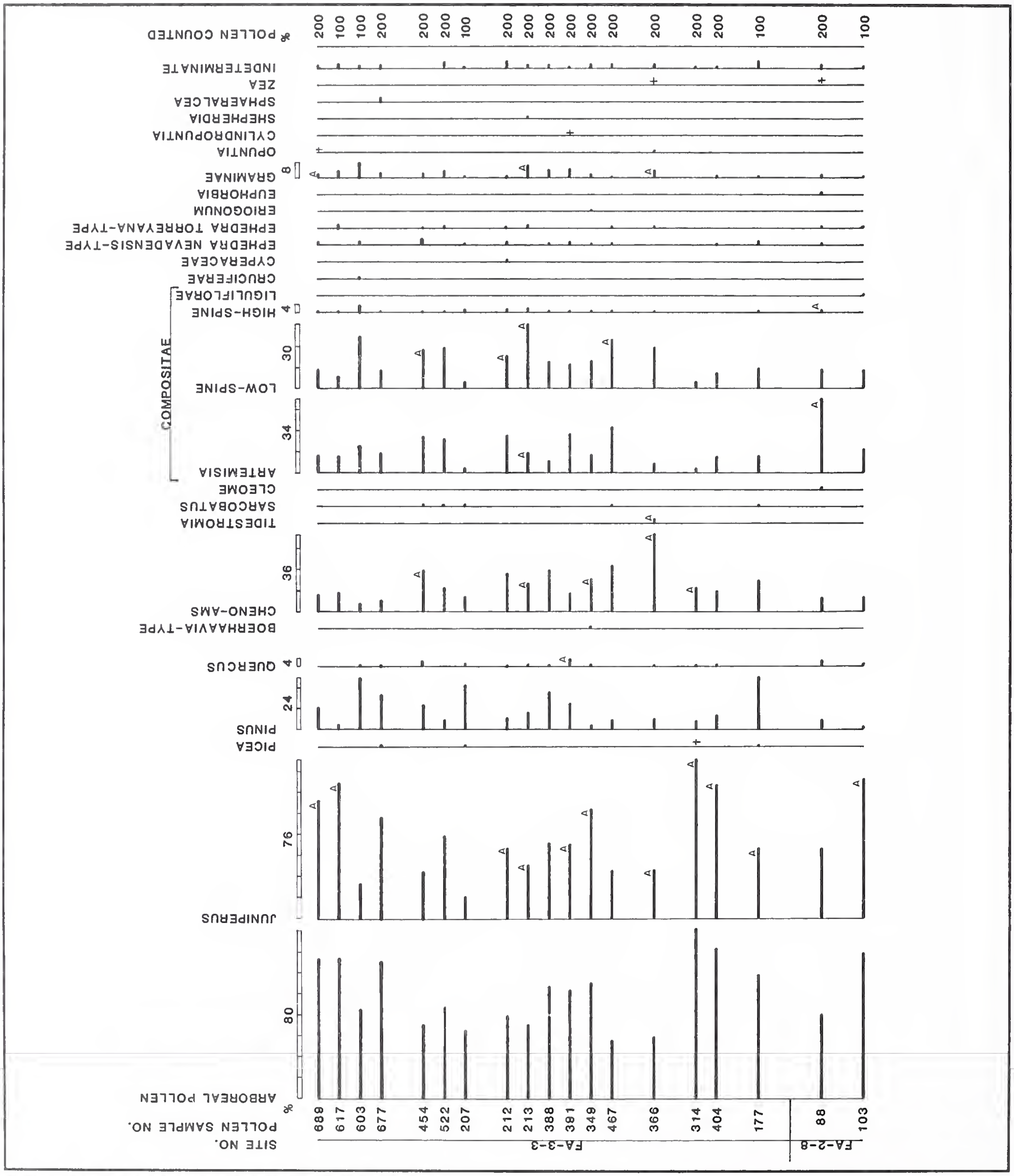

Figure 16-2. Pollen diagrams for sites FA 3-3 and FA 2-8.

Table 16-4. Proveniences of Pollen Samples From FA 3-3.

Sample No.	Feature No.	Locus No.	Depth In CM Below PGS[1]	Provenience
689	15			Central hearth fill in pithouse.
617	13		67	Floor of pithouse (F. 13) immediately south of central hearth.
696	13			Against west wall of structure, within 5 cm of bedrock floor; insufficient pollen.
603	13			Against east wall of structure, within 5 cm of bedrock floor.
677	13			Posthole fill from pithouse, SW edge of structure.
657	13			Below rooffall/wallfall and above bedrock floor in south end of structure.
454	6		2	Midden, SW section, 1.5 m north of F. 13.
522	6		4	Midden, NW corner, less than 1 m from F. 7, a roasting pit, rodent disturbance.
236	6		7	Midden, NE section, 4 m NE of F. 13, insufficient pollen.
207	5		6-8	Cobble-ring hearth eroding into small arroyo, charcoal and ash fill, 7 m NE of pithouse and adjacent to NE edge of F. 6.
212	3		20	Slab-lined roasting pit filled with charcoal, ash, and cobbles; sample from NE quad of roasting pit.
213	3			Slab-lined roasting pit, west 1/2.
388	11		63	Basin-shaped, unlined hearth, filled with ash and sand, located below F. 3.
391	11		70	Basin-shaped, unlined hearth, bottom.
349	11		48	Suface level associated with F. 11.
467		4	60	Possible living surface below F. 11.
366	4		2-4	Cobble-ring hearth, bottom lined with cobbles, filled with ash and charcoal.
374	4			Cobble-ring hearth, sample taken under bottom cobble, insufficient pollen.
424	9		7	SW corner of cobble filled roasting pit, root disturbance, insufficient pollen.
422	9		9	North corner of cobble filled roasting pit, root disturbance, insufficient pollen.
164	1		22	Cobble-ring hearth filled with charcoal and black ash, possible pot rest stone in hearth, root disturbance, insufficient pollen.
165	1		33	Cobble-ring hearth, below cobble at base of hearth, insufficient pollen.
314	10		6	Possible hearth or ash dump.
404	10		12	Stain area associated with F. 10.
177	2		10	Hearth, possibly modern, sample from ash level, 10 m north of F. 9.

[1] Present ground surface.

Table 16-5. Proveniences of Pollen Samples From FA 2-8.

Sample No.	Feature No.	Locus No.	Depth in CM Below PGS[1]	Provenience
88			10-20	Hearth fill, sampled during testing.
103			10-12	Charcoal concentration, sampled during testing.

[1] Present ground surface.

these plants as food. In addition, Artemisia may have been used as a fuel in the hearth. A large quantity of Juniperus pollen and aggregates were noted in sample 103 from the charcoal concentration. This may reflect either the presence of a juniper in the immediate vicinity of this feature, or possibly the use of juniper as a fuel in a hearth, if this concentration can be related to such a feature.

Summary and Conclusions

Aggregates of single pollen types have been observed frequently in these samples, and are relied upon to provide data concerning subsistence at these sites. The large number of culturally affiliated samples and the relatively small variability of the pollen frequencies within some of these samples limits interpretation of the pollen record based solely on pollen frequencies. Aggregates of Juniperus pollen appear to be associated primarily with hearths and roasting pits at sites FA 3-3 and FA 3-6. This probably indicates the use of juniper as a fuel, since it is abundant in this area. Juniper berries have also been exploited as food (Cushing 1920; Smith 1974; Gallagher 1977), and appear to have been ground on metates at an Archaic site northwest of Farmington (Scott Cummings, this volume). The stratigraphic fill of the structure and the fill of the mealing bin/storage area at site FA 1-6 contained Juniperus aggregates, indicating that at least some of the aggregates were present due to natural deposition from vegetation in the immediate vicinity. Aggregates of Cheno-ams were also associated with hearth samples, indicating that this plant was probably utilized as a food source. Its presence within the hearth would indicate cooking of Cheno-am greens or parching of Cheno-am seeds.

Cheno-ams are a widely-exploited food resource for both greens and seeds (Stevenson 1915; Robbins et al. 1916; Whiting 1939). Cheno-am pollen presence within middens may be the result of the discarding of Cheno-am waste, or possibly the concentrated growth of Cheno-ams in this disturbed soil. Growth of Cheno-ams within the disturbed soil of the midden and the fill of abandoned structures and features, such as the mealing bin/storage area, would provide an excellent resource for exploitation by the occupants of these sites. It is possible that these plants were permitted or encouraged to grow.

Other pollen types which appear to indicate use of plants as foods within these sites include Cleome, Graminae, Opuntia, Cylindropuntia, Shepherdia, and Zea. These pollen types are noted rarely, or, in the case of Graminae, only occasionally exhibit evidence of aggregates which might indicate their exploitation. Cleome greens were boiled for food and used as a pottery pigment (Stevenson 1915; Robbins et al. 1916; Whiting 1939). Grass seeds were ground into meal, and Oryzopsis (Indian rice grass) was particularly prized for its large seeds (Robbins et al. 1916; Cushing 1920; Beaglehole 1937; Whiting 1939; Colton 1974). Opuntia was exploited for its fruit and pads; frequently the larger spines were burned off (Stevenson 1915; Robbins et al. 1916; Beaglehole 1937; Whiting 1939; Nequatewa 1943). The fruit and buds of Cylindropuntia were both used as food (Stevenson 1915; Robbins et al. 1916; Whiting 1939; Nequatewa 1943). Shepherdia (buffalo berry) is noted to have been used as a food by various Native American groups (Harrington 1967; Smith 1974). Zea may be used in many forms, including grinding the kernels into flour, boiling the kernels, and boiling green corn still on the cob. The husks and leaves may also be used for a variety of purposes (Stevenson 1915; Robbins et al. 1916; Cushing 1920; Whiting 1939). Zea pollen was noted only occasionally, which may indicate limited reliance on cultivated plants at these sites. The pollen evidence for Zea is so limited that it is possible that corn was being brought into these sites rather than being actually grown at them. Pollen washes of corn in various states following harvest indicates that Zea pollen may be transported on corn which has had the husk removed, and on kernels that have been removed from the cob (Gish and Scott Cummings 1983). Possibly the macrofloral analysis of material from these sites can address this question more fully.

The pollen record at these sites indicates that the local environment was exploited as an important source of food and fuel. Heavier reliance on native plants than cultivated ones is postulated for these sites, based on the scarcity of Zea pollen. When cultigens are a major contributor to the diet larger frequencies of Zea pollen are expected from midden deposits, storage/mealing facilities, and even hearths, than were evident in these samples. This implies that these people were relying heavily on local native resources for their food. It also suggests that these sites may represent temporary or seasonal occupations in the area.

The pollen assemblage within samples from these sites indicates that the components of the biotic communities during the occupation of these sites were not significantly different from those in the area today. It is likely that the frequencies of these plants varied through time, but sampling of the features within these sites was not designed to address this question directly.

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Chapter 17 • Pollen Analysis at FA 1-2, FA 1-5, FA 2-7, FA 2-8, FA 2-16, and FA 2-17

Linda Scott Cummings

Introduction

Pollen analysis of material from archeological sites in the vicinity of Farmington, New Mexico, has been undertaken in conjunction with archeological testing. The pollen record from five sites in this area has been previously studied and reported (Scott Cummings, this volume). Six additional sites were selected for pollen analysis and are discussed herein. Four of the sites are located to the north and northeast of Farmington on Hood Mesa, which is drained by ephemeral streams that ultimately flow into the Animas River. Two additional sites are situated southeast of Farmington above the San Juan River. Pollen analysis at these six sites was aimed primarily at the recovery of subsistence data. In addition, a stratigraphic column was sampled for paleoenvironmental data inside a rockshelter. Radiocarbon dates from these sites range from ca. 2250 B.C. to A.D. 1300.

Methods

The pollen was extracted from soil samples submitted by the Forest Service from sites in northwestern New Mexico. A chemical extraction technique based on floatation is the standard preparation technique used in this laboratory for the removal of the pollen from the large volume of sand, silt, and clay with which they are mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal and pollen density is low.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the floatation process. All samples received a short (10 minutes) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for three minutes to remove any extraneous organic matter.

A light microscope was used to count the pollen to a total of 200 grains at a magnification of 430x. Pollen preservation in these samples varied from good to poor. Comparative reference materials collected at the Intermountain Herbarium at Utah State University and the University of Colorado Herbarium were used to identify the pollen to the family, genus, and species level.

Pollen aggregates were recorded during identification of the pollen. Aggregates are clumps of a single type of pollen, and may represent pollen dispersal over short distances, or the actual introduction of portions of the plant represented into an archeological setting. Aggregates were included in the pollen counts as single grains, as is customary. The presence of aggregates is noted by an "A" above the pollen type on the pollen diagram (Fig. 17-1).

Redeposited pre-Quaternary pollen is frequently noted in studies from western New Mexico (Hall 1977; Gish 1978, 1982). Unique pre-Quaternary palynomorphs signal the possibility that additional pollen from plants that were part of both the pre-Quaternary and Quaternary vegetation may be present. The incidence of unique pre-Quaternary pollen in these samples is very low, indicating a low probability for the redeposition of pollen types similar to those of Quaternary pollen. Therefore, no problems stemming from the redeposition of pre-Quaternary pollen are anticipated in the interpretation of the pollen record from these sites.

Discussion

The pollen record from each site will be discussed separately to facilitate interpretation of the pollen data on a site-by-site basis. Integration of the data and comparison with pollen data from other sites in this area will be made in the Summary and Conclusions section.

FA 1-2

Site FA 1-2 consists of a cluster of groundstone and cobbles located near the edge of an unnamed wash to the northeast of Farmington. The cluster areas also contained evidence of fire-cracked rock, lithics, dark-stained soil, and a possible hearth. The hearth was radiocarbon dated to 2255 B.C. ± 290, while the general stained area yielded a date of 1220 B.C. ±635 (Bertram, this volume). The present vegetation at the site consists of pinyon (Pinus), juniper (Juniperus), ephedra (Ephedra), sagebrush (Artemisia), and various shrubs.

The pollen record from the present ground surface at this site is indicative of its location within a pinyon/juniper zone. High quantities of both Juniperus and Pinus pollen were observed in the sample, as well as aggregates of both these pollen types. The understory vegetation is poorly represented in this sample, but appears to consist of sagebrush, various composites, a few Cheno-ams, some Ephedra, and grasses.

The two subsurface samples were taken from a hearth and from an area of unstained soil outside the hearth (Table 17-1). The sample taken from the hearth (FS 83) contains relatively small quantities of arboreal pollen (Juniperus and Pinus), but large quantities of Cheno-am pollen (33%), as well as aggregates of that pollen type, an increased frequency of Artemisia pollen (14%), a large quantity of Low-spine Compositae pollen (18%),

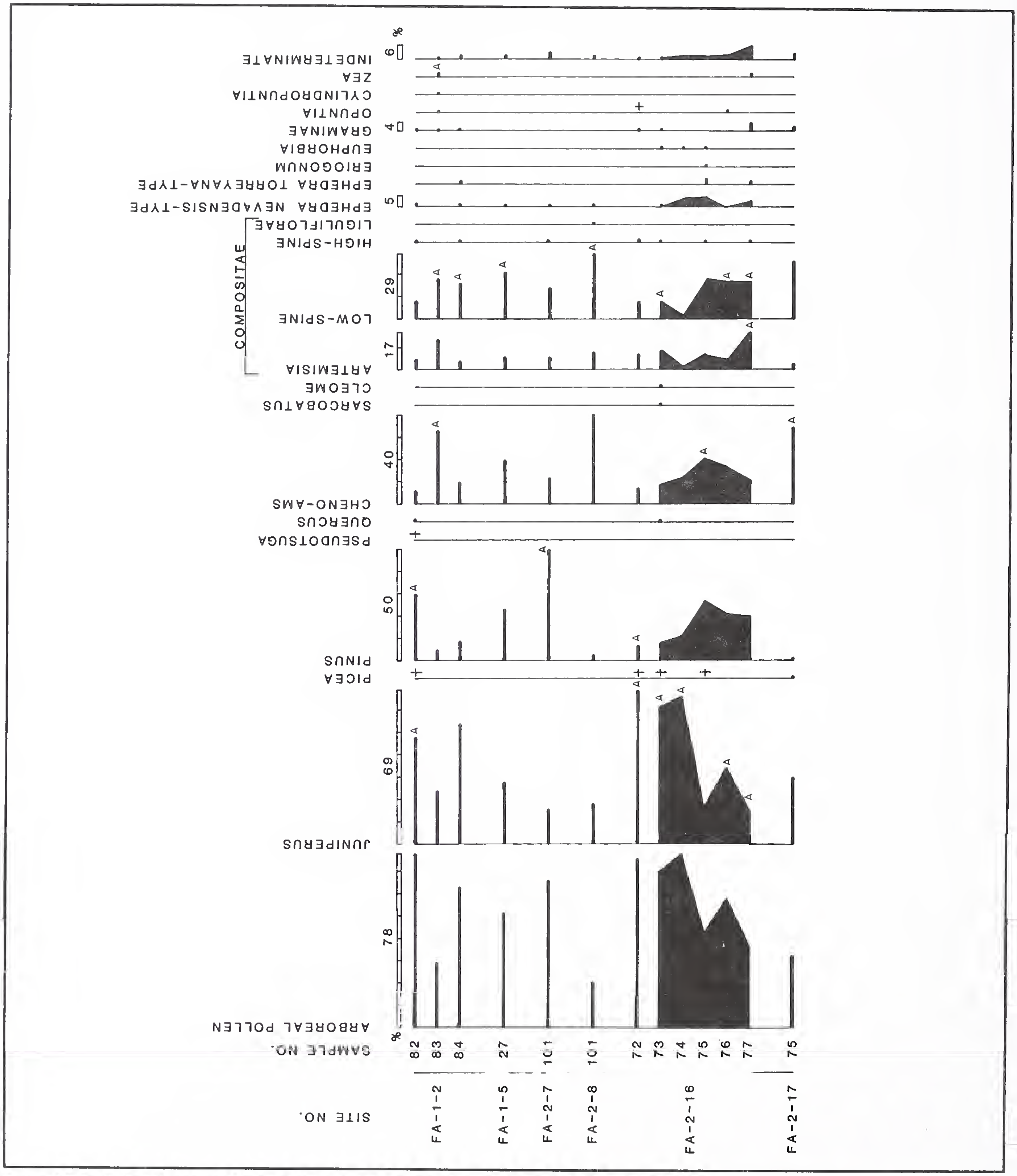

Figure 17-1. Pollen diagrams for Sites FA 1-2, FA 1-5, FA 2-7, FA 2-8, FA 2-16, and FA 2-17.

as well as aggregates of that pollen type, and small quantities of Graminae, Opuntia, and Cylindropuntia pollen (Fig. 17-1, Table 17-2). In addition, this sample exhibited evidence of Zea pollen (2%), and an aggregate of Zea (corn) pollen. This sample indicates that not only was a cultivated food, corn, cooked or prepared in the hearth, but that several native foods including Cheno-ams, Opuntia, Cylindropuntia, and perhaps Artemisia may also have been cooked in this hearth. The large quantity of Low-spine Compositae pollen may relate to the utilization of a member of this family, or more probably may be indicative of disturbance due to occupation of the site, since these weedy annuals thrive in disturbed soils.

Cheno-ams are a morphological group of pollen including all members of the Chenopodiaceae family, as well as the genus Amaranthus. Both Chenopodium and Amaranthus are noted to have been exploited for their greens and seeds. The greens are preferred in the spring when they are tender, but may also be gathered later in the season. The leaves are boiled and may be eaten as greens or with other foods. The seeds are gathered, threshed, and ground into meal, which may be used alone or mixed with cornmeal (Colton 1974; 300; Cushing 1920: 244-245; Nequatewa 1943:19; Robbins et al. 1916:53; Stevenson 1915: 63, 66, 83, 87; Whiting 1939: 73-74). Atriplex (saltbrush) ashes are also used as an alkali to maintain the blue color in blue cornmeal. In addition, it is used as a fuel and in the manufacture of pahos (prayer sticks) (Colton 1974: 292; Robbins et al. 1916: 29, 75, 89; Stevenson 1915: 44, 66; Whiting 1939:73). Opuntia (prickly pear cactus) and Cylindropuntia (cholla cactus) were both exploited for their edible fruits, which were frequently boiled or rubbed with a stone to remove the spines. The fruit may be eaten raw or stewed, and may also be dried for winter use. The dried fruit may also be ground into flour and mixed with parched cornmeal. The roots were also eaten raw or pounded, boiled, and the liquid drunk. The pads of prickly pear cactus were eaten, and the buds of cholla cactus were gathered, cooked, and eaten (Beaglehole 1937: 70; Nequatewa 1943: 18-19, 70, Robbins et al. 1916: 62; Stevenson 1915: 69; Whiting 1939: 85-86). Artemisia was used as a medicine, food, and fuel. The leaves were made into a tea and drunk as a remedy for colds, while the seeds were ground and mixed with water to make balls or pats, which were steamed. Zuni legends declare that this was among their most ancient foods (Stevenson 1915: 42, 65, 87).

Sample FS 84 was taken from an unstained area outside the hearth and was not associated with any living surface. It yielded arboreal pollen frequencies more similar to those of the present ground surface, although the Pinus pollen frequency is considerably lower than that of the present. The Cheno-am frequency is similar to that of the present ground surface and considerably less than that of the hearth. No Opuntia, Cylindropuntia, or Zea pollen is noted in this sample. The similarity between sample FS 84 taken from an unstained area outside the hearth and that of the present ground surface, and their dissimilarity to the sample from the hearth, strengthen the interpretation that corn and numerous native plants were cooked within the hearth.

FA 2-8

Site FA 2-8 consists of lithics, ceramics, and subsurface hearths located within the adjacent to a wash northeast of Farmington. The site is situated immediately north of a ridge and southeast of an eroding slope at an elevation of 5830 feet. A large portion, perhaps 60 percent, of the site has been eroded away by water activity. The on-site vegetation consists of pinyon (Pinus), juniper (Juniperus), and ephedra (Ephedra). Pueblo I ceramics were noted at the site and radiocarbon dates ranging from 82 B.C. ± 298 to A.D. 755 ± 135 were obtained (Bertram, this volume).

Pollen samples were taken from the northwest hearth (FS 102) and a cultural level above three hearths (FS 101). The sample from the hearth did not yield sufficient pollen for analysis. The cultural level, which was radiocarbon dated to 82 B.C. ± 298, displays a relatively low frequency of arboreal pollen. Very high frequencies of Cheno-am pollen (40%) and low-spine compositae pollen (29%), as well as an aggregate of low-spine compositae pollen, point to the probable utilization of Cheno-ams, and either use of a member of the composite family or the increase of this weedy plant at the site due to local disturbance.

This site was previously tested and sampled for pollen (Scott Cummings, this volume). A hearth yielded a large quantity of Artemisia pollen, and aggregates of both Artemisia and High-spine Compositae pollen. In addition, both Zea and Cleome pollen were observed. A charcoal concentration yielded a large quantity of Juniperus pollen, as well as aggregates of that pollen type, suggesting the use of juniper as a fuel or perhaps exploitation of the berries as a food or the leaves as a medicine. Juniper leaves were boiled and used as a common medicinal beverage. Juniper berries were eaten with piki or in a stew, and were considered by some more palatable if heated over the fire. Juniper berries may also be boiled, roasted, or dried and ground into a meal (Beaglehole 1937: 71; Colton 1974: 330; Cushing 1920: 243, 255; Robbins et al. 1916: 39-40; Stevenson 1915: 55, 93; Whiting 1939: 62).

Table 17-1. Proveniences of Pollen Samples From FA 1-2, FA 1-5, FA 2-7, FA 2-8, FA 2-16, and FA 2-17.

FS No.	Depth in CM Below PGS	Provenience	Radiocarbon Dates	Pollen Counted
FA 1-2				
82	0	Present ground surface		200
83		Hearth fill	2255 B.C. ± 290[1]	100
84		Unstained soil outside hearth		100
FA 1-5				
27		Above hearth and below sand		200
28	6-8	Hearth, dark stain	1662 B.C. ± 238	Insuff.
FA 2-7				
101		Fill of 2 superimposed deflated hearths		200
FA 2-8				
101	1-10	Cultural level above hearths	82 B.C. ± 298	200
102		Hearth fill	A.D. 755 ± 135	Insuff.
FA 2-16				
72	0	PGS outside shelter		200
73	0	PGS inside shelter		200
74	20	Non-cultural stratum		200
75	35	Dark laminated cultural stratum		200
76	45	Non-cultural stratum	A.D. 1278 ± 58	200
77	50	Ash lens, cultural	A.D. 495 ± 150	100
78	60	Compact clay, non-cultural		Insuff.
FA 2-17				
75	5-7	Charcoal stain		200

[1] Calibrated date at 95 percent confidence interval.

FA 2-7

Site FA 2-7 is located very close to FA 2-8 and consists of a lithic and ceramic scatter containing Pueblo II/III ceramics, an historic fire hearth, and historic trash dump. In addition, a prehistoric hearth, which was sampled for pollen, and a possible stone alignment were noted at the site. Small drainages presently dissect the site. The vegetation on the site includes pinyon (Pinus), juniper (Juniperus), and various shrubs.

The fill of two possible deflated hearths was analyzed as a single sample. These possible hearths were superimposed and extremely disturbed. The fill of the two hearths could not be distinguished, and so were sampled as a single entity. The pollen record from this hearth yielded a very large quantity of arboreal pollen, composed primarily of Pinus pollen, including aggregates of Pinus pollen. This is significantly different from the conditions observed at site FA 1-2 and the closer site FA 2-7. A small quantity of Cheno-am pollen was observed, which probably represents the presence of these plants in the local environment. No pollen indicative of cultural activity is noted in this sample, with the possible exception of the extremely high pine pollen frequency. It is quite possible that pine was used as a fuel in this hearth, perhaps during the spring when the pine was pollinating, which would yield a large quantity of pine pollen, as well as aggregates of pine pollen.

FA 1-5

Site FA 1-5 is located on the western edge of Hood Mesa between the La Plata River and Chokecherry Canyon, and consists of a lithic scatter with a limited amount of ceramics and a hearth noted on the surface. The hearth was radiocarbon dated to 1662 B.C. ± 238 (Bertram, this volume). A small drainage runs through the site from west to east. On-site vegetation includes pinyon (Pinus), juniper (Juniperus), and scrub oak (Quercus).

Two pollen samples were taken from this site, one above the hearth and the second sample within the hearth. The sample taken from the hearth did not contain sufficient pollen for analysis. The sample taken above the hearth, however, yielded a pollen record slightly similar to that of the present ground surface at FA 1-2, with the exception that the arboreal pollen, specifically Juniperus pollen, occurs in a lower frequency at this site. A moderate quantity of Cheno-am pollen is observed at this site, as is a large frequency of low-spine compositae pollen, and an aggregate of this pollen type. There is little in this sample to suggest economic activity.

FA 2-17

Site FA 2-17 is located southeast of Farmington in a dunal area near an unnamed wash, and consists of a lithic scatter and a single ceramic sherd. A charcoal stain was noted within one of the lithic scatters, and was sampled for pollen. The present vegetation at the site includes pinyon (Pinus), juniper (Juniperus), and ephedra (Ephedra). No radiocarbon dates were obtained from this site.

A single pollen sample was taken from a charcoal stain 5-7 cm. below the present ground surface. This sample contained a moderate quantity of arboreal pollen, composed almost entirely of Juniperus pollen, which is similar to the present ground surface samples at the nearby site FA 2-16. A relatively large quantity of Cheno-am pollen (34%) was observed, as well as aggregates of this pollen type, suggesting that Cheno-ams may have been processed. The Low-spine Compositae pollen was relatively high in this sample, indicating disturbance near the site.

Table 17-2. Pollen Types Observed in Samples From Sites FA 1-2, FA 1-5, FA 2-7, FA 2-8, FA 2-16, and FA 2-17.

Scientific Name	Common Name
Arboreal Pollen:	
Juniperus	Juniper
Picea	Spruce
Pinus	Pine
Pseudotsuga	Douglas-fir
Quercus	Oak
Non-arboreal Pollen:	
Cheno-ams	Pigweed and goosefoot family
Sarcobatus	Greasewood
Cleome	Beewood
Compositae	Sunflower family
Artemisia	Sagebrush
Low-spine	Includes ragweed, cocklebur, etc.
High-spine	Includes snakeweed, rabbitbrush, etc.
Liguliflorae	Dandelion and chickory
Ephedra	Mormon tea
Eriogonum	Buckwheat
Euphorbia	Spurge
Gramineae	Grass family
Opuntia	Prickly pear cactus
Cylindropuntia	Cholla cactus
Zea	Maize, corn

FA 2-16

Site FA 2-16 is a small rockshelter situated at the base of a sandstone cliff overlooking a sagebrush clearing and a broad, sandy wash, which drains into the San Juan River. This site is located very close to site FA 3-6, which has been reported previously (Scott Cummings, this volume). An area of ash and fire-cracked rock is located approximately 60 m. southeast of the rockshelter. Both lithics and ceramics have been observed at this site. In addition, prehistoric and historic rock art are observed in the vicinity of the rockshelter. The present vegetation near the site includes juniper (Juniperus), pinyon (Pinus), sagebrush (Artemisia), ephedra (Ephedra), and yucca (Yucca). The fill of the rockshelter was sampled stratigraphically for pollen. A radiocarbon date of A.D. 495 ± 150 was obtained at a depth of 40-50 cm (Bertram, this volume).

Two samples from the present ground surface were taken at this site, one outside the rockshelter and a second inside the rockshelter. Comparison of these two samples indicates that pollen rain being distributed inside the rockshelter is indeed indicative of the vegetation in the vicinity of the rockshelter. The two samples are very similar to one another, containing a very high frequency of arboreal pollen, composed almost entirely of Juniperus pollen. Aggregates of Juniperus pollen were noted in both samples, while aggregates of Pinus pollen were observed only outside the rockshelter. Relatively low frequencies of Cheno-am pollen, Artemisia, and Low-spine Compositae were noted in these samples. In addition, Opuntia pollen was observed only outside the rockshelter.

Subsurface samples from this site display considerable variation. A non-cultural level sampled at 20 cm. below the present ground surface contains large quantities of arboreal pollen, similar to those observed at the present ground surface. Indeed, there is little in this sample to distinguish it from the present ground surface, indicating that the vegetation during this period was very similar to that of the present. A very small quantity of Cleome pollen was noted from this sample, suggesting economic activity. Cleome may be exploited for both its greens and seeds. Young plants are preferred for greens, which are boiled and eaten. More mature plants are frequently also gathered, boiled until thick and black, patted into cakes, and dried. These cakes may then be reconstituted and used as pottery paint or fried in grease to eat. The seeds may also be gathered and ground into meal (Castetter 1935: 22; Harrington 1967: 72; Robbins et al. 1916: 58-59; Stevenson 1915: 69, 82; Whiting 1939: 77-78).

A dark laminated soil containing cultural debris at 35 cm. below the present ground surface displays considerably less Juniperus pollen (16%) and more Pinus pollen (28%) than do the modern samples. Cheno-am pollen is observed as approximately twice the frequency noted at the present ground surface, and aggregates of Cheno-ams were also observed in this sample. An increase in Low-spine Compositae pollen, as well as Ephedra nevadensis-type and Ephedra torreyana-type pollen, was also noted in this cultural level. The pollen record in this sample suggests the utilization of Cheno-ams, Ephedra, and possibly also Pinus. Ephedra is noted to have been used primarily as a medicine. A beverage is frequently made from the dried stems and flowers (Colton 1973:312; Robbins et al. 1916:46; Stevenson 1915:49,67; Whiting 1939:73-74). Pine nuts were exploited by many groups. The nuts were frequently roasted to preserve them for long periods of time. In addition, pine was a valuable construction material and fuel (Castetter 1935:40; Colton 1974:347; Nequatewa 1943:18; Robbins et al. 1916:41; Stevenson 1915:70; Whiting 1939:63). The increased Low-spine Compositae pollen frequency may be related to increased disturbance of the habitat during occupation.

A non-cultural level separating the dark laminated soil and the ash lens contains an increase in arboreal pollen, primarily Juniperus. The Cheno-am frequency of Low-spine Compositae pollen and presence of Low-spine aggregates are also noted in this level. A single percent of Opuntia pollen is also observed in this sample. This non-cultural level displays evidence of considerable disturbance in the vicinity of the site, as is evidenced by the large quantity of Low-spine Compositae and presence of aggregates of this pollen type in the sample, and by relatively large quantity of Cheno-ams, which are also weedy annuals. It is also possible that rodent or other animal activity within the rockshelter introduced larger quantities of some pollen types, and may be responsible for the introduction of Opuntia pollen to the rockshelter.

The lowest sample to yield pollen at this site was taken from an ash lens 50 cm. below the present ground surface. A radiocarbon date from soil 40-50 cm. below the present ground surface yielded an age of A.D. 495 ± 150. This sample exhibits a very small quantity of arboreal pollen, and a low frequency of Cheno-am pollen similar to that of the present ground surface. A high frequency of Artemisia pollen, as well as aggregates of this pollen type, were observed in the sample. Low-spine Compositae pollen is noted in a relatively large quantity and aggregates are present, indicating disturbance at this level. The increased Artemisia pollen may be indicative of the utilization of sagebrush, perhaps as a food resource, or the wood as fuel. Ephedra pollen is noted in a higher frequency than at present, indicating the possibility that this resource was exploited, perhaps to make a beverage or medicine, at this rockshelter. This sample was also the only sample to yield evidence of the cultigen Zea. Two percent Zea pollen was observed in this sample, and is directly indicative of the utilization and/or storage of this cultivated plant in the rockshelter.

The lowest sample taken from the rockshelter was removed from a non-cultural impact clay below the cultural level. Unfortunately, this sample did not yield sufficient pollen for analysis.

Summary and Conclusions

Pollen analysis of samples from five sites in the vicinity of Farmington, New Mexico, has yielded limited evidence of subsistence activity. Zea pollen is the only pollen present representative of cultivated plants. This is not unusual in the pollen record, as both squash and beans are insect pollinated and their pollen is observed rarely.

Limited evidence of the exploitation of native vegetal resources was also observed. The pollen record suggests the exploitation of local resources for fuel, including probably pine, juniper, and sagebrush. In addition, various local vegetal resources appear to have been utilized for subsistence and medicine, possibly including Cheno-ams, Cleome, Opuntia, Cylindropuntia, Ephedra, and Artemisia. Zea pollen is the only evidence of agriculture in the pollen record at these sites. Corn pollen was noted in a hearth radiocarbon dated to 2255 B.C. $\pm$ 290 at FA 1-2, and in the lowest level of the rockshelter (FA 2-16), which was radiocarbon dated to A.D. 495 $\pm$ 150.

These small sites may represent specialized activity sites occupied over a limited time. The pollen record is consistent with short-term occupation and/or restricted or specialized activity areas. No evidence was recovered from the pollen record to suggest that any of these sites functioned primarily as a plant procurement/processing site.

Comparison of the pollen data from this site with previous work near Farmington (Scott Cummings, this volume) produces a consistent paleothnobotanic record. Site FA 2-13 was an Archaic or BMII open campsite, while the remaining four sites (FA 1-6, FA 3-3, FA 3-6, and FA 2-8) spanned BMIII to PIII occupations. Site FA 3-6 was an open campsite, while sites FA 1-6 and FA 3-3 contained masonry structures and/or pithouses.

The relatively small amount of variability of the pollen frequencies within some of the samples from four sites analyzed for pollen near Farmington (Scott Cummings, this volume) limits interpretation of the pollen record based solely on pollen frequencies. Therefore, pollen aggregates were relied upon to provide data concerning subsistence. The composite pollen record from all eleven sites examined in the vicinity of Farmington displays consistency in plant exploitation. Aggregates of Juniperus pollen appear to be associated primarily with hearths and roasting pits at sites FA 3-3 and FA 3-6. This probably indicates the utilization of juniper as a fuel, since it is abundant in this area. Juniper berries have also been exploited as food (Cushing 1920; Smith 1974; Gallagher 1977), and appear to have been ground on metates at Archaic site FA 2-13 (Scott Cummings, this volume). The stratigraphic fill of the structure and fill of the mealing bin/storage area at site FA 1-6 contained Juniperus aggregates, indicating that at least some of the aggregates were present due to natural deposition from vegetation in the immediate vicinity of the features.

Aggregates of Cheno-ams were associated with charcoal stains and hearths at sites FA 1-2, FA 1-6, Fa 2-8, FA 2-17, FA 3-3, and FA 3-6, indicating the probability that this plant was utilized as a food source. Its presence within the hearth would indicate cooking of Cheno-am greens or parching of Cheno-am seeds. Cheno-ams are a widely exploited food resource for both greens and seeds. Cheno-am pollen presence within middens may be the result of the discarding of Cheno-am waste, or possibly the concentrated growth of Cheno-ams in this disturbed soil. Growth of Cheno-ams within the disturbed soil of the midden and the fill of abandoned structures and features, such as the mealing bin/storage area, would provide an excellent resource for exploitation by the occupants of these sites. It is possible that these plants were permitted or encouraged to grow in such a situation.

Other pollen types which appear to be indicative of the utilization of native plants as foods within these sites include Cleome, Gramineae, Opuntia, Cylindropuntia, Shepherdia, and Typha. These pollen types were noted rarely, or in the case of Gramineae, only occasionally exhibit evidence of aggregates which might indicate their exploitation.

Zea pollen was noted only occasionally, which may indicate limited reliance on cultivated plants at these sites. The pollen evidence for Zea is so limited at these sites that it is possible that corn was being transported here rather than actually grown at the sites. Pollen washes of corn in various states following harvest indicates that Zea pollen may be transported on corn which has had the husk removed, and on kernels that have been removed from the cob (Gish and Scott Cummings 1983).

The pollen record at these sites indicates that the local environment was exploited as an important source of food and fuel. Heavier reliance on native plants than cultivated plants is postulated for these sites based on the scarcity of Zea pollen. When cultigens are a major contributor to the diet larger frequencies and/or more regular occurrence of Zea pollen are expected from midden deposits, storage/mealing facilities, and even hearths than were evidenced in these samples. This implies that these people were relying heavily on local native resources for their food. It also suggests that these sites may represent temporary or seasonal occupations.

The pollen assemblage from these sites indicates that the components of the biotic communities during the occupation of the sites were not significantly different from those that may be observed in the area today. It is probable that the frequencies of these plants varied through time, as is suggested by the stratigraphic samples taken inside the rockshelter at FA 2-16.

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Chapter 18 • Pottery of the Farmington Area: Sites FA 1-6 and FA 3-3

A. Helene Warren

Site FA 1-6

Testing

The decorated pottery from Farmington Site FA 1-6 (testing phase) is predominantly mineral painted and represents at least two McElmo B/w bowls (Table 18-1). The paste and surface finish of the decorated sherds are reminiscent of the polished wares at Aztec ruin. The rim sherds, however, are tapered, in contrast to the late Pueblo III bowls at Aztec, which have squared rims. The mineral painted sherds generally are tempered with crushed sherd and igneous rock, while one of the McElmo B/w bowl sherds is tempered with crushed rock only. No slips could be detected on any of the vessels, probably because the white firing clays used made slipping unnecessary, or a slip of the same clay as the paste was used which would not be detected.

Dates for Mancos Black-on-white vessels have been established between A.D. 900 and 1150, while McElmo B/w with tapered rims (syn. Wetherill B/w) has been dated between A.D. 1050 and 1150 (Hayes 1964).

The potters who had produced the wares found at the site were apparently having problems in applying mineral paint, as many of the sherds had but little pigment remaining.

One sherd of unslipped redware was tempered with fine-grained igneous rock, possibly diorite. The temper grains are less than 0.5 mm., and black hornblende prisms are present. This could be a body sherd of La Plata B/r, which dates circa A.D. 800 to 1000 (Breternitz et al. 1974:61-61) or 1075 (Breternitz 1966).

An unusual piece at this site is one rim sherd of a Rio Grande Glaze-paint ware, which probably dates to the late seventeenth century. The sherd is a bowl sherd, probably of Kotyiti G/r, but with a rim similar to a Group F type, Trenequel Glaze-polychrome. The temper is a diabase (basalt) that is characteristic of the Zia villages along the Jemez river. The vessel, or sherd, may have been brought to the area by Pueblo refugees during or prior to the Pueblo Revolt of 1680.

Excavation

The potsherds recovered during excavation at Site FA 1-6, appear to be less diverse than those from the testing phase (Table 18-2). Decorated wares are mainly Mancos Black-on-white bowl and jar sherds; only one sherd of carbon paint was noted. Utility ware sherds are mainly Mancos Corrugated, although Mesa Verde Corrugated is also present.

Production of the vessels represented by these potsherds appears to have been predominantly local. White-firing clays are common in the Upper Cretaceous outcrops of the Farmington area; however, buff-to-brown pastes also occur. The temper used is invariably from the porphyries that can be found in the terrace gravel along the major channel in the area.

The use of igneous rock temper in the San Juan Valley has long been recognized (Shepard 1939). During her investigations of pottery in the La Plata Valley, Shepard found two major classes of temper: crushed rock, and diorite and andesite porphyries. The igneous rocks are derived from the San Juan Mountains to the north and include a wide variety of igneous rocks, ranging from granite to gabbros. The prehistoric potters undoubtedly selected the rock tempers because of suitable grain size and friability rather than mineral or chemical composition. Granitic porphyries with biotite inclusions appear to be more commonly used east of Farmingtion, particularly at the Salmon ruin. Sandstone temper is not common at FA 1-6, and the material appears to be from the local Cretaceous units.

Three sherds of Blue Shale (Mancos) Corrugated with trachyte temper undoubtedly came from vessels made in the Chuska Valley to the southwest of Farmington.

Notes on Paint and Temper

In general, the mineral-painted wares are tempered with crushed sherds, and fragments and minerals from hornblende, porphyries, and diorite, while the carbon-paint vessels are tempered with crushed rock. However, a variety of paint types of different colors and composition appear to have been utilized on the vessels from FA 1-6, some of which have either worn off or never had adhered to the vessel surfaces. Shepard (1965) found that carbon paint required a certain amount of porosity in the clays used in order to absorb the carbon and hold the paint. A nonabsorptive clay will not permit carbon to enter the clay surface; in this case a mineral paint may be needed. The apparent poor control of some of the paints at this site may indicate that the potter was experimenting with new paint materials and clays, possibly switching from carbon paint to mineral.

The use of igneous rock temper in the San Juan Valley has long been recognized (Shepard 1939). During her investigations of pottery in the La Plata Valley, Shepard found two major classes of temper. Andesite and diorite were identified as the rocks most commonly used to temper pottery. During field reconnaissance in 1981, a wide variety of friable igneous rocks suitable for temper were found in the terrace gravels of the San Juan River and its northern tributary. These porphyries range in composition from granite porphyries with biotite orthoclase and plagioclase, to svenite, monzonite, and diorite (personal observation, 1981). Identification of specific rock types within a locality that were used by prehistoric potters has been difficult. Nevertheless, regional studies of the paste and temper of the pottery of the San Juan Valley might identify a real preference on the part of the local prehistoric potters through time.

Site FA 3-3

Testing

Only one sherd with a painted design was found at Farmington site 3-3 during testing. This sherd of a bowl rim was tempered with Chuska Mountains trachyte and was intrusive to the site. This type is dated between A.D. 900 and 1000.

One sherd of Captain Tom Corrugated with oblique indented corrugations was punched obliquely. The Tohatchi Banded sherds have bands averaging 13 mm. wide, and are tempered with coarse sandstone (perhaps Gallup sandstone). The majority of utility vessel sherds are to be classed as Mancos Gray and Mancos Corrugated. These are tempered with Hornblende porphyry and other igneous rocks from the gravel terraces along the San Juan River and its northern tributaries (Table 18-3).

Although the two utility types, Mancos gray and Mancos Corrugated, have been described as separate types, their texturing is similar to the single utility type Tohatchi Banded of the Red Mesa Valley and Puerco River.

Table 18-1. Pottery and Temper Classifications of Selected Sherds, FA 1-6, Testing.

Pottery Type	Spec. No.	Temper	Suggested Source Area
McElmo B/w, bowl sherds	45-3 35-1 59-1	Crushed sherd (0103) white to lt. Gray, same color as paste: clear, fine-grained quartz: feldspar. lt. gray, vitreous, icy, residual oblate. Lt. gray to black clay pellets.	Farmington area & west
McElmo B/w, bowl sherd	170-1	Hornblende diorite, fine grains include icy white feldspar rhombs; black hormblende, gold mica with rainbow colors.	San Juan Valley Farmington area
Mancos B/w, jar sherd	6-8	Crushed sherd, white, less than 0.5mm, mineral grains as in 170-1.	As above
Mancos B/w, jar sherd	61-1	Angular white sherd; subangular to subrounded quartz; clear vitreous feldspar; olive green pyroxene; grains 0.2mm.-0.5mm. (3243?)	As above
Mancos B/w, jar sherd	140-30	Light gray sherd, hornblende diorite (3242)	As above
Mancos B/w, jar sherd	122-1	As above	As above
Mancos B/w, bowl sherd	58-1	Sandstone, fine to coarse, clear rounded quartz, lt. gray witreous feldspar, white rock matrix (2113,3242)	
Mancos B/w, jar	142-53	White sherd, sparse subangular clear quartz; feldspar, vitreous, clear vitreous, clear rhombic. Aplastics: oblate white to black clay pellets.	San Juan Farmington area
Mancos B/w, bowl	142-46	Crushed very lt. gray sherd, same color as paste, igneous rock fragments, white feldspar,black hornblende, yellow-green pyroxene, silver gold mica.	

Table 18-1. Pottery and Temper Classifications of Selected Sherds, FA 1-6, Testing (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Unidentified	142-58		
Mancos B/w, bowl	11-5 57-1	Sherd, white, 0.2-1. Omm, angular very fine-grained sand, igneous rock matrix, oblate clay pellets, fine to to coarse, white to black.	As above
White-ware bowl	125.1	Sherd, augite hornblende porphyry (3070-12) with abundant magnetite filings.	As above
White-ware jar	142-50 142-49	Quartz grains, rounded, clear to subangular, equant, fine-grains. Traces of feldspar, clear, albite twinning; dark brown with pearly luster.	As above. Sandstone may be from Kirtland Fruitland from N. and W. of Farmington
Redware jar	77-1	Fine-grained intermediate igneous rock with hornblende prisms, grains 0.5mm	Four corners area
Kotyiti Glaze on-red bowl	142-47	Zia diabase	Zia pueblos
Mesa Verde Corr. jar	140-20	Igneous rock temper (3070-12) with quartz, hornblende, augite, porphyry	San Juan Valley gravel terraces
As Above	2-1 13-1 21-3 41-2 46-3	Igneous rock temper (3070-12), porphyry as above.	As above
As Above	6-2 12-1 12-2 43-3	Igneous rock (307-11) porphyry, quartz, muscovite	As above
As Above	137-1 142-54	As above (3070-11), porphyry, quartz with silver, gold mica.	San Juan Valley east of Farmington
Mancos Corr.	7-9 37-1	Trachyte or trachybasalt, coarse fragments.	Chuska Valley
Mancos Corr. Oblique Ind.	2-2 20-2 19-3 60-2	Igneous rock (3070-12); porphyry with quartz, hornblende, augite.	San Juan Valley gravel terraces
Mancos Corr. Smeared Ind.	4-2 6-3	Ignenous rock (3070-12);	As above

Table 18-1. Pottery and Temper Classifications of Selected Sherds, FA 1-6, Testing (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Mancos Corr. Smeared Ind.	8-4 11-3 16-1 7-10 138-4 141-3 154-4	Igneous rock (3070-12)	As above
Utility, Plain	1-2 5-1 10-8 11-4 17-2 23-1 24-4 49-1 148-1 157-1	As above	As above
Utility, Plain	60-1	Igneous rock (3070-15); porphyry with quartz, white feldspar, augite, sparse gold mica; oblate clay pellets	As above
Utility "crumbs"	8-3 142-59 142-52 142-55 142-60		

Table 18-2. Pottery and Temper Classifications of Selected Sherds, FA 1-6, Excavation.

Pottery Type	Spec. No.	Temper	Suggested Source Area
Mancos B/w jar sherd	279-1	Crushed sherd and sandstone (2140-02).	San Juan Valley upper Cretaceous outcrops
Mancos B/w, bowl	202-1	Medium grained sandstone, angular quartz, and crushed sherd.	As above
Mancos B/w, jar	290-4 398-1 309-10	Medium grained sandstone, (2050-71); oblate clay pellets; design ticked line red-brown mineral paint; one edge of sherd is abraded.	As above
Whiteware bowl	283-1	Hornblende diorite, fine-grained.	La Plata River Valley
Mancos B/w jar	227-6 237-1	Fine-grained sandstone and sherd fragments; (2040-02)	San Juan River Valley

Table 18-2. Pottery and Temper Classifications of Selected Sherds, FA 1-6, Excavation (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Mancos B/w bowl	227-1	Medium-grained sandstone; anqular quartz, clear; (2051): rounded grains.	As above
Whiteware jar	253-1	Porphyry (igenous rock) (3070-13) with gold mica, crushed sherd.	As above
Mancos B/w, jar	324-1	Porphyry (3070-12)	As above
Plainware jar	307-2	Porphyry (3070)	As above
Mancos B/w bowl	279-2 240-1	Porphyry (3070-12)	As above
Mancos B/w, bowl jar	253-2 216-1	Porphyry (3070-15)	As above
Carbon/ white bowl	307-3	Porphyry (3070-03)	San Juan Valley Cretaceous clays
Whiteware, 1 bowl 1 jar	290-19	As above 210-1	As above
Mancos B/w worked sherd, bowl	276-1	Porphyry (3070-10)	As above
Mancos B/w bowl	371-1 372-1 374-1 373-1	Porphyry (3070-10	As above
Whiteware, bowl	252-1 265-1 290-5	Porphyry (3070-10)	As above
Mesa Verde Corr., jar	244-1 273-4	Porphyry (3070)	As above
Mesa Verde Corr. Indented Oblique jar	192-2 196-4 196-5 196-6 279-4 256-1	As above	As above
Mancos Corr. jar smeared ind.	283-16 290-11 290-21	As above	As above
Utility ware Rim	232-3	Porphyry (3070)	As above
Utility ware, tecomate	380-2	As above	As above

Table 18-2. Pottery and Temper Classifications of Selected Sherds, FA 1-6, Excavation (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Utility ware, plain	198-3	As above (3070)	As above
Mancos Corr. jar	206-9	Porphyry (3070)	San Juan Valley
Mancos Corr. smeared, indented	290-9	As above	As above
Utility rim	242-1	As above	As above
Utility, jar sherd	192-1 194-2 196-1	As above	As above
Mancos Corr., smeared, indented oblique	196-2	Porphyry (3070)	As above
Mancos Corr., jar rim	219.1	Porphyry (3070)	As above
Mancos Corr., smeared indented right	212.3	As above 309.7	As above
Mesa Verde Corr., jar	290-18 194 212-1 297-11	Porphyry	As above Bloomfield area
Mancos Corr., smeared indented, jar	192-2 283-7 297-9 410-1	Porphyry (11,13)	San Juan Valley
Utility plain jar	249-2 309-3 307-1 413-1	As above	As above
Mesa Verde Corr.,	216-2	Porphyry (3070-12)	As above
Mancos Corr.,	221-1 226-1 261-1 283-8 290-16 290-22	As above	As above
Utility ware strap handle	246-1	Porphyry (3070-12) as above	San Juan Valley

Table 18-3. Site FA 3-3, Testing.

Pottery Type	Spec. No.	Temper	Suggested Source Area
Naschitti B/w bowl	27.1	Trachyte (3181-52), fine quartz grains	Chuska Valley
Whiteware, bowl	16.2	Trachyte, fine sherd, quartz.	As above
Captain Tom Corr. jar	44.2	Trachyte fragments	As above
Utility, gray jar	81.1 96-3	Trachyte (3181)	As above
Tohatchi Banded jar	102.1 102-2	Gallup sandstone (2150; 2080); very coarse quartz, milky and subangular	Various
Utility, gray jar	97-4 97-5 25-2	Gallup sandstone (2150)	Various
Mancos Gray/Mancos Corr. jar	70-2	Hornblende porphyry (3301)	San Juan Valley
As above	115-3	As above	As above
Mancos Corr. clapboard, incised	62-1	As above	As above
Mancos Corr. neckbanded	114-2	As above	As above
Mancos Corr. neckbanded	63.3	As above	As above
Mancos Corr. smeared ind.	84-1 125-1	As above	As above
Mancos Gray/Mancos Corrugated	105-1	Hornblende porphyry (3301)	San Juan Valley
Whiteware jar	118-1	Porphyry (3070-12)	San Juan Valley
Mancos Gray	47-3	As above	As above
Mancos Gray, rims	13-1 42-1	As above	As above
Mancos Gray	28-1 28-2	As above	As above

Table 18-3. Site FA 3-3, Testing (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Mancos Corr., Indented Obliq.	45-2 42-2 70-1 5-1 116-2	As above	As above
Utility, plain	12-3 20-5 23-1 22-3	As above	As above
Mancos Corr., indented	7-1	As above	As above
As above	70-4	As above	As above
Utility, plain	80-3	As above	As above
Mancos Corr., indented oblique	2-1 4-1	Porphyry with gold mica (3070-11)	As above

Table 18-4. Site FA 3-3, Excavation.

Pottery Type	Spec. No.	Temper	Suggested Source Area
Cortez B/w dipper	543-2	Very fine grains of quartz (2140) traces of trachyte (3181), yellow green stubby pyroxene, sanidine with minute black inclusions.	San Juan Valley or the Chuska
Cortez B/w Bowl	552-1 586-1 586-2 665-1	Crushed sherd; white fine gr. fragements (0102-71)	San Juan Valley
Nava B/w jar, McElmo B/w bowl	235-1 611-1	Trachyte (3181-02) with crushed sherd Fine grained sandstone and crushed sherd	Chuska Valley San Juan Valley
Whiteware jar	691-1	Trachyte (3181-02 with fine gr. fragments of crushed sherd	Chuska Valley
Whiteware jar	533-2	Porphyry quartz (3070-12)	San Juan Valley
Whiteware jar	597-1	Porphyry (3070-12), quartz, feldspar	As above

Table 18-4. Site FA 3-3, Excavation (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Mancos Corr. jar	282-1 354-1 351-1 352-1 445-1	Porphyry (3070-12)	As above
Blue Shale Corr.	754-1 761-1	Trachyte, very coarse (3181)	Chuska Valley
Mancos Corr. jar	266-1	Hornblende porphyry (3301-11)	La Plata Valley
Mancos Corr., oblique indented jar	285-1	Hornblende, pyroxene quartz porphyry (3070-18)	San Juan Valley
Mancos Corr. Tooled	401-1 533-11	Hornblende porphyry:(330-11)	La Plata Valley
Mancos Corr. oblique indented	268-1	Augite hornblende porphyry (3070-12)	San Juan Valley
Mancos Corr., oblique indented jar	300-1 296-1 293-1 327-13 327-20 327-22 327-4 513-1 193-1 190-1	Hornblende biotite porphyry (3070-13)	As above
Mancos Corr/ Hovenweep Gray style	475-1 310-1 615-1	Hornblende biotite porphyry (3301-13)	La Plata Valley
Mancos Corr.	356-1	Hornblende porphyry (3301-11)	As above
Mancos Corr. Oblique porphyry indented	267-1	Hornblende biotite porphyry (3301-10)	As above
Mancos Corr. Oblique Indented	608-1	Hornblende porphyry (3301-11)	As above
Mancos Corr.	533-9	As above (3301-11)	As above
Mancos Gray	279-1 280-1 406-1	As above (3301-11) fine grained sandstone (2140), Mesaverde SS	As above

Table 18-4. Site FA 3-3, Excavation (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Captain Tom Corr.	685-1	Trachyte (3181)	Chuska Valley
Mancos Gray jar	193-2	Hornblende porphyry (3301)	La Plata
Mancos Gray jar	450-1	As above	As above
Mancos Gray jar	383-1 385-1	As above	As above
Plain Gray bowl	328-2	Porphyry, gold mica, hornblende (3070-13)	San Juan Valley
Plain Gray jar	185-1 533-1	Hornblende porphyry (3301)	La Plata Valley
Plain Gray jar	759-1	Coarse sandstone (2080), smoky quartz, feldspar	Unknown
Plain Gray jar	542-1	Porphyry (3070)	La Plata Valley
Plain Gray jar	469-1 760-1	Trachyte (3181)	Chuska Valley

Table 18-5. Pottery and Temper Classifications.

Pottery Type	Spec. No.	Temper	Suggested Source Area
Site FA 1-1, Testing			
Mesa Verde Corr. jar	38-2 29-1 38-1	Porphyry (3070), abundant magnetite	San Juan Valley
Mesa Verde Corr.	32-1	Porphyry (3070) clear twinned feldspar	As above
Site FA 1-2, Testing			
Mancos Corr. jar	23-1	Biotite porphyty (3070-11) clear, white spar	San Juan Valley

Table 18-5. Pottery and Temper Classifications (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Site FA 2-6B, Testing			
Mancos Corr., (rims) jar (body)	16-1 17-1 5-1 1-1 2-1 4-1	Quartzite, clear vitreous, friable (4020)	As above
Site FA 2-7, Testing			
Jeddito Red/yellow jar	8-1	Fine grained sandstone with hematite stains, cream-colored sherd fragments, felsite fragments (2090-80)	Hopi area
Jeddito Plain jar	7-1 31-4	As above	As above
Mesa Verde B/w jar	98-4	Porphyry, silver & gold mica 3070-11)	San Juan Valley
Plainware, white	36.1	As above	As above
Piedra Brown jar rim	4-1	Porphyry, gold mica (3070-11)	San Juan Valley
Piedra Brown jar	58-1 59-1 59-3 59-4 67-4 67-9 70-2 71-4 72-1 73-11 73-19 74-7 90-3	As above	As above
Rosa Brown	73-25	Sandstone	
Mancos Gray jar	82-1	Hornblende porphyry (3301-12)	As above
Mancos Corr. jar rim, body	7-1 7-2 6-1	Hornblende porphyry, gold mica (3070-11)	As above
Site FA 2-9, Testing			
Grayware, polished jar	45-1	Quartz, gold mica porphyry (3070-11)	San Juan Valley

Table 18-5. Pottery and Temper Classifications (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Site FA 2-10, Testing			
Whiteware jar (worked sherd)	1-1	Crushed sherd, white subangular, medium grained quartz (0104-62)	La Plata
Plain utility jar	17-1	Augite porphyry, very coarse fragments (3070-12)	As above
Site FA 2-11, Testing			
Mancos Corr.	8-1	Hornblende porphyry (3301-11)	As above
Site FA 2-16, Testing			
Mesa Verde B/w bowl	40-1	Crushed sherd, vitreous feldspar; powdery hermatite grains (0102-69); quasicircular, worked	San Juan Valley
Mesa Verde B/w bowl	68-1	Porphyry, biotite (3070-11)	As above
Whiteware bowl	35-1	White sherd, porphyry fragments (0103-80); sherd	As above
Mancos Gray, tooled mini jar	44-5	Quartz, subangular (2050)	Unknown
Grayware, plain jar rims	50-22 16-48	Porphyry, subangular quartz (3070-62)	San Juan Valley
Grayware, plain jar sherds	31-1 39-1 45-5 50-6 50-18 50-16 55-7	Porphyry, subrounded, colored quartz (3070-63)	As above
Mancos Corr. jar	33-1 44-6	Porphyry, gold mica (3070-12)	As above
Mancos Corr. jar	41-1	Porphyry (3070-12)	As above
Site FA 2-17, Testing			
Mancos Corr. rim direct	212-1	Crushed sherd & quartz, fine to medium grains.	La Plata Valley
Site FA 3-4, Testing			
Mancos B/w bowl rim	4-3	Augite porphyry (3070 + 2140) and Upper Cretaceous sandstone grains; small white clay pellets	San Juan Valley

Table 18-5. Pottery and Temper Classifications (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Nava B/w bowl sherd	4-1	Trachyte (3181)	Chuska Valley
Whiteware bowl	4-2	Biotite porphyry (3070-11)	San Juan Valley
Site FA 3-6, Excavation			
Mancos Corr. jar sherds	433-1 575-1	Quartz muscovite porphyry (3070)	As above
Site FA 4-1, Survey			
Wingate Black-on-red bowl sherd	1-13	Coarse white sherd in orange paste; hematite fragments	Upper Little CO Valley
Mesa Verde B/w bowl sherds	1-1 1-2 1-11 1-3	Hornblende porphyry (3301-12); clay plates and pellet inclusions	La Plata Valley
Mancos Corr. jar	1-4	Biotite porphyry (3070-11)	San Juan Valley
Mancos Corr. jar	1-5	Augite porphyry	San Juan Valley
Mancos Corr.	1-6	As above	San Juan Valley
Site FA 4-2, Survey			
Mesa Verde B/w jar	2-1 2-2	Porphyry (3070) Valley	San Juan
McElmo B/w (?) bowl	2-7 2-5	Hornblende porphyry (3301-12)	La Plata Valley
Mesa Verde B/w (?) bowl	2-4	Porphyry (3070)	San Juan Valley
Mancos Corr. jar	2-9	Hornblende biotite porphyry (3301-14)	La Plata Valley
Site FA 4-4, Survey			
Piedra Gray (?) jar	4-1 4-4	Medium sandstone, hornblende (2053)	San Juan Valley
Site FA 5-1, Testing			
Hovenweep Corr. jar	21-1	Rhyolite, lt. gray vitrophyre (3070-11) with high temperature quartz crystals	San Juan Valley

Table 18-5. Pottery and Temper Classifications (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Site FA 5-3, Testing			
Redware jar	14-1	Crushed white sherd, sparse quartz (0101-62	Unknown
Mancos B/w bowl rim	21-1	White sherd, quartz clear feldspar; (0102-69)	San Juan Valley
Mancos B/w bowl	44-2 56-4 57-4 57-3 18-1	Hornblende porphyry, very fine grs. (3301-14)	La Plata Valley
Mancos B/w bowl rim	23-1	Fine sherd, quartz (0102-62	As above
Mancos B/w bowl	19-1	Sandstone, upper Cretaceous (2140)	San Juan Valley
Mancos B/w bowl	15-1	Hornblende porphyry (3301-02)	La Plata Valley
Mancos B/w jar	38-2	Sherd, quartz, clear feldspar (0102-69)	San Juan Valley
Mancos B/w jar	58-7	Coarse white sherd, quartz (0104-62)	As above
Whiteware, small jar	20-1 17-1 56-6	Augite muscovite porphyry (3070)	As above
Whiteware jar	6-1 32-1	Crushed sherd, fine, and quartz	As above
Moccasin Gray jar	57-8	Hornblende, mica porphyry,	La Plata Valley
Mancos Corr. jar	41-1 58-6 34-1	Hornblende, green porphyry, very coarse	San Juan Valley
Mancos Corr. jar	57-7 31-1	Porphyry (3070)	As above
Mancos Corr. jar	9-1	Porphyry (3070)	As above
Site FA 6-1, Testing			
Mesa Verde B/w bowl	146-1	Hornblende porphyry (3301)	La Plata Valley

Table 18-5. Pottery and Temper Classifications (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Mesa Verde B/w jar	75-2	Porphyry	San Juan Valley
Mancos Corr.	63-5 59-3	Quartz mica porphyry (3070-11)	As above
Site FA 6-4, Survey			
Mancos B/w jar	22	Sherd, clear feldspar (0102-69) Upper Cretaceous sandstone (2140)	La Plata Valley
Whiteware jar	11	Hornblende porphyry, fine sandstone (3301;2140)	As above
Mancos B/w jar	12	Fine sherd, quartz (0102-62)	San Juan Valley
Mancos B/w jar	25	Upper Cretaceous sandstone fractures, sherd (2140-02)	As above
Mancos B/w jar	29	Crushed sherd and quartz; (0103-62)	As above
Mancos B/w jar	13	Crushed sherd, hornblende	La Plata Valley
Mancos B/w jar	17	Porphyry (3070-02), Crushed sherd	San Juan Valley
Captain Tom Corr. jar	15	Trachyte (3181)	Chuska Valley
Mancos Corr. jar	26	Porphyry (3070)	San Juan Valley
Mancos Corr. jar	14	Porphyry (3070)	San Juan Valley
Mancos Corr. jar	24	Porphyry (3070)	As above
Mancos Corr. jar	16 21 27	Porphyry (3070)	As above
Mancos Corr. jar	18	Porphyry (3070)	San Juan
Mancos Corr. jar	19	Hornblende porphyry (3301)	La Plata Valley
Mancos Corr. jar	20 23	Porphyry	San Juan Valley
Mancos Corr. jar	10 30	As above, with clay pellets	
Isolated Find, Crew 5			
Blue Shale	IF 2-7	Trachyte (3181)	Chuska Valley

Table 18-5. Pottery and Temper Classifications (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
Isolated Finds, Crew 3			
Mancos B/w bowl rim	IF 5-1	Mesaverde sandstone (2140)	San Juan Valley
Chapin B/w bowl	IF 6-1	Porphyry (3070)	As above
Mineral/white bowl	IF 8-1 8-2	Medium sandstone (2050-03)	As above
Mancos Corr. jar rim	IF 10-7	Porphyry (3070)	As above
Mancos Cor. jar	IF 13-2	Porphyry (3070-11)	As above
Mancos Corr. jar	IF 19-1	Porphyry (3070)	As above
Mancos	IF 23-1	Porphyry (3070)	As above
Isolated Finds, Crew 6			
Bluff (?) Black-on-red bowl	IF 21-1	Crushed Sherd, quartz (0103-62)	N. San Juan Valley
Mancos B/w bowl	IF 17-1	Crushed sherd (fine); igneous grains	San Juan Valley
Mancos B/w bowl	IF 32-9	U. Cretaceous sandstone (2140-01) sherd	As above
Mancos B/w bowl	IF 32-6	Porphyry	As above
Whiteware bowl	IF 6-1	Porphyry (3070-03), crushed sherd	As above
Mancos B/w jar	IF 13-4 IF 13-5 IF 13-1 IF 13-6 IF 13-3	Porphyry (3070-03) crushed sherd	As above
Mancos B/w jar	IF 32-7 64-10	Crushed sherd, med. quartz (0103-62)	As above
Whiteware jar	IF 32-8	Crushed sherd, igneous rock	As above
Whiteware jar	IF 31-1 32-2	Hornblend porphyry (3301-80)	La Plata Valley

Table 18-5. Pottery and Temper Classifications (continued).

Pottery Type	Spec. No.	Temper	Suggested Source Area
McElmo B/w bowl	IF 20-1	Crushed sherd, igneous rock (0103-80)	San Juan Valley
McElmo B/w bowl	IF 2-2 2-1	Hornblende porphyry (3301)	La Plata Valley
MesaVerde B/w bowl	IF 31-1	As above, with clay pellets	As above
Mancos Corr. jar	IF 32-1 33-10 68-1	Porphyry (3070)	San Juan Valley
Mancos Corr. jar	IF 32-5	Porphyry (3070)	As above
Mancos Corr. jar	IF 64-9	Biotite porphyry (3070)	As above
Mancos Corr. jar	IF 25-1	Porphyry (3070)	As above
Mancos Corr. jar	IF 54-6 54-5	Porphyry (3070)	La Plate Valley
Mancos Corr. jar	IF 48-1	Porphyry (3070)	San Juan Valley
Mancos Corr. jar	IF 31-1	Porphyry (3070)	As above
Mancos Corr. jar	IF 64-11	As above (3070)	As above
Mancos Corr. jar	IF 60-2	Trachyte (3181)	Chuska Valley
Plain Utility jar	IF 31-2	Porphyry (3070-62) quartz	San Juan Valley

Tohatchi Banded is dated between A.D. 900 and 1050. Mancos Corrugated is contemporary with Mancos Gray in the San Juan region, dating circa A.D. 875 to 950; however, Mancos Corrugated was produced in the San Juan region until circa A.D. 1200. Both types are corrugated, which may lead to some confusion concerning their separation. Captain Tom Corrugated is a variety of Mancos Gray that was produced in the Chuska Valley circa 870 to 9500. In west-central New Mexico, in the Socorro Black-on-white district, the local banded and ribbed wares with similar tooling and texturing to Mancos Gray, have been dated A.D. 1050 to 1150 and 1150 to 1275. Corrugated oblique-indented utility wares similar in construction to Mancos Corrugated may be associated with the Socorro area banded and ribbed wares, Pitoche and Pilares Banded, in the Ladron Mountain area.

Excavation

Based on ceramics, there appear to be at least two temporal components in the excavated sample of FA 3-3. The first dates between A.D. 875 and 900 or 950; the second includes McElmo and Nava B/w, two carbon-paint wares, and ranges from circa 1075 to 1250 or later.

Mancos Corrugated has a manufacturing period betweeen A.D. 900 and 1200, while Mancos Gray is restricted to the period between A.D. 875 and 950. The primary difference between the two utility wares is in the corrugated texturing. Mancos Gray is noted for narrow neckbands, which were 3 to 6 mm. wide at this site. Tooling includes incising and punch marks, resulting in a variety of surface treatments. Mancos Corrugated generally has oblique indented coils.

The tooled utility wares have wide areal distribution throughout northwestern and west-central New Mexico. However, manufacturing dates vary on a regional basis (Table 18-4).

There is one small gray bowl that may be a test pot or possibly a charm.

The majority of the vessels were produced in the San Juan Valley or region, and contain a variety of crushed igneous rock tempers (Table 18-4). Intrusive wares from the Chuska Valley include Nava B/w, Blue Shale Corrugated, and Captain Tom Neckbanded.

Other Ceramics

The tempering materials of ceramics collected from other sites in the Farmington project area are given in Table 18-5. These are discussed in more detail by Raish (this volume).

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Chapter 19 • Ceramic Description and Analysis

Carol Raish

Introduction

The ceramic analysis from the Elena Gallegos Land Exchange Project continues the long history of ceramic research in the San Juan Basin. Excellent discussions of this research, its progress, and its problems can be found in Windes (1977), Warren (1979), and Franklin (1980). Consequently, a detailed overview of the history of pottery studies in the San Juan Basin is not presented here.

During the course of this project, ceramics were analyzed from 24 small or limited-activity sites, and 34 isolated finds, in the Farmington study areas. The ceramics from these sites consist of 1011 sherds representing at least 386 vessels. These range from Basketmaker III through Pueblo III, with an emphasis on the Pueblo II and Pueblo III periods.

The overwhelming majority of identifiable ceramics belong to the San Juan (Mesa Verde) ceramic tradition. This study follows Franklin (1980, 1983) in referring to San Juan and Mesa Verdean ceramics as members of the San Juan ceramic tradition. This ceramic tradition is characteristic of the Anasazi north of the San Juan River in the La Plata and Animas drainages, in southwestern Colorado, and southeastern Utah. A very small amount of Cibola Tradition pottery from the Gallup/Chaco Area to the south is also present as is a slightly greater amount of Chuska Tradition pottery from the area of the Chuska Mountains. In addition, small amounts of White Mountain Red Ware, Rio Grande Glaze Ware, brown ware, and yellow ware are found in the area.

Objectives

The first objective of the ceramic study is to provide a description of the most common pottery types that occurred on the sites under consideration, to serve both as a basis for this study and also for use by future researchers. The remaining objectives of the study are derived from the research framework (this volume) and are concerned with both site specific and regional information. The purposes are to obtain the following information.

1. <u>Chronological placement of the sites based on the pottery types present and, to a considerably lesser extent, the design styles present</u>. The use of pottery types as temporal indicators has a long history in the Southwest. Design styles, too, have been shown to give useful chronological information (Warren 1979: 188-198; Franklin 1980: 88-94). The pottery sequences will be used in combination with other means of dating to determine the duration of occupation of the several study areas. As discussed in the Revised Research Framework (this volume), there is a special research interest in determining if these areas were being occupied or used during the occupation of larger pueblos in the vicinity such as Salmon and Aztec.

2. <u>Nature and function of the sites in the areas under consideration based on vessel form and ratio of painted to utility vessels</u>. These ceramic data will be used in combination with other lines of information offered by lithics, features, and structures present on the sites. That certain aspects of pottery are useful indicators of site function, in combination with other evidence, has been discussed by various Southwestern researchers (Franklin 1980: 402-406; Sudar-Laumbach 1980: 960-966, 1016-1018; Sebastian 1983: 409-419; <u>inter alios</u>). Knowledge of site function is of particular importance to this study as it is a critical component in understanding the larger adaptive diversity model under examination (Revised Research Framework, this volume).

3. <u>Patterns of both local and regional interaction shown by ceramics from the sites</u>. This information will be determined by noting if pottery types are local or intrusive. Detailed temper studies and pottery refiring studies, such as those discussed by Warren (1967, 1977), Windes (1977), Franklin (1979a, 1979b, 1980), and Wilson (1985) will also be conducted to determine if pottery tempers and clays appear to be local or intrusive. Pottery types and technological attributes will be compared especially closely to the assemblages from both Salmon and Aztec to determine if relationships with these two sites are detectable. This kind of information will help determine if the Farmington sites were related to or interacting with local, larger pueblos or if they represent intrusion or exchange from other areas (Revised Research Framework, this volume).

The data derived from meeting these objectives will give a basic description of the pottery from the study areas for use in the present study and for use by other researchers. They will also provide information necessary to address the ceramic-related parts of questions posed by the research framework.

Methodology

Field Methods

The 24 sites and 34 isolated finds containing ceramics occurred primarily on the mesa slopes north of the San Juan River in the immediate vicinity of Farmington, New Mexico. These sites are small or limited-activity sites.

Small structural sites are represented by two known pitstructures. The remaining sites consist of lithic and/ or ceramic scatters with or without associated features, two rockshelter areas, and one rock art site.

Of the 24 sites, 6 were surveyed only, 15 were either surveyed and tested or only tested (several sites were identified during the testing program that had not been noted during survey), and 3 were excavated. The number of sherds recovered from these sites ranges from highs of 300 and 222 from the two excavated pitstructures, respectively, down to single sherds recovered from several of the surveyed and tested sites (Tables 19-1 and 19-2).

Table 19-1. Sherds Recovered from Surveyed, Tested, and Excavated Sites.

	Survey	Testing	Excavation	Total
FA 1-1		13		13
FA 1-2		1		1
FA 1-5		1		1
FA 1-6	16	91	193	300
FA 2-6B		17		17
FA 2-7	2	13		15
FA 2-8	4	164		168
FA 2-9		1		1
FA 2-10		3		3
FA 2-11	1	1		2
FA 2-16		56		56
FA 2-17		1		1
FA 2-19	7	14		21
FA 3-3	2	87	133	222
FA 3-4	3			3
FA 3-5	1			1
FA 3-6		2	8	10
FA 4-1	14			14
FA 4-2	10			10
FA 4-4	6			6
FA 5-1		1		1
FA 5-3		42		42
FA 6-1		8		8
FA 6-4	21			21
TOTAL	87	516	334	937

The majority of the survey was conducted by the Museum of Northern Arizona under contract to the Forest Service during the late fall of 1981. Testing was conducted by a Forest Service crew during the late winter

Table 19-2. Sherds Recovered as Isolated Finds During Survey.

Isolated Finds	Sherds
FA 1-IF1	1
FA 1-IF2	1
FA 1-IF5	2
FA 1-IF11	3
FA 2-IF1	2
FA 2-IF2	1
FA 2-IF7	2
FA 2-IF9	1
FA 2-IF13	1
FA 2-IF15	1
FA 3-IF5	1
FA 3-IF6	1
FA 3-IF8	2
FA 3-IF10	1
FA 3-IF13	2
FA 3-IF19	1
FA 3-IF23	1
FA 5-IF2	1
FA 6-IF2	2
FA 6-IF6	4
FA 6-IF13	6
FA 6-IF17	I
FA 6-IF20	2
FA 6-IF21	1
FA 6-IF25	1
FA 6-IF30	1
FA 6-IF31	3
FA 6-IF32	9
FA 6-IF33	6
FA 6-IF48	2
FA 6-IF54	2
FA 6-IF60	4
FA 6-IF64	3
FA 6-IF68	2
TOTAL	74

and spring of 1982. Designated sites were then excavated by a Forest Service crew during the summer and fall of 1982.

The methods of data collection and recording varied considerably from the survey to the testing and excavation phases. During the latter two phases, all materials were either provenience-plotted or recovered from designated grid units. Every attempt was made to recover all observed materials. During the survey phase, however, only non-systematic, "grab" samples of diagnostic materials were collected.

Since there are no records of what percentages of items were surface-collected from each site, there is no way to know if the survey collections are representative of the total assemblage or not. Utility wares are often underrepresented in these types of collections, as they are less visible than painted wares and generally not considered diagnostic (Sebastian 1983: 414-415). Consequently, this type of collection strategy does not lend itself to functional research questions based on information concerning utility wares, the ratio of utility wares to painted wares, or the relationships of different vessel forms to each other, especially if utility ware forms are involved. Thus, emphasis will be placed on the data from sites that were tested and/or excavated for the functional aspects of this study. Since the majority of sites were both surveyed and tested, this data base should be sufficient.

Laboratory Methods

The ceramic analysis on the Elena Gallegos Project was designed and begun by A. H. Warren during 1981 and 1982. She prepared the pottery code, code guide, and analysis forms, and has graciously continued to give valuable assistance whenever asked. Warren's pottery coding guide is reproduced in Appendix 19-2. She has also completed a temper analysis of the Farmington pottery (this volume) and been involved in the analysis and reporting of pottery from other areas of the project.

When the present author began to work on the pottery in 1983, a few additional attributes were added, primarily describing vessel wall thickness, orifice diameter, and percent of rim present. This information was added to the data forms of previously analyzed sherds. A type collection from all areas of the project was developed, and potsherds for comparative purposes were borrowed from the Laboratory of Anthropology, Santa Fe.

Pottery analysis then began with sherd matching. Matching is valuable as it allows for use of a relatively uninflated attribute or type count. Exact matches also yield larger surfaces from which to obtain more accurate vessel measurements. This technique also helps to alleviate concerns about differential vessel breakage and the production of more sherds from larger vessels. In addition, matching allows valuable statements to be made concerning the possible contemporaneity of provenience units based on the presence of sherds from the same vessel.

Matching was carried out in the following way. Sherds from each site were washed, numbered, and matched to the other sherds from the same phase (survey, testing, or excavation) on the same site. Matching was restricted by site and by phase. Since the sites and study areas are scattered, it was felt that intersite matching would not be productive. The decision to restrict matching to the same phase of operations on a site was primarily one of convenience. Cross-phase matching became difficult to manage on the analysis forms and very time-consuming.

Sherds were considered to be from the same vessel if they fit together exactly, or if they matched on the basis of temper, surface color, surface finish, paint, and design style similarities. Such non-exact, or "non-glueable," matches were made with considerable conservatism. Matches were made first by the author and later rematched by Warren during the temper analysis (this volume). The second matching serves as a check on the first.

The vessels used in this study, then, are the inferred vessels produced by having sought possible matches for each sherd. Thus, some vessels may contain only one sherd, but they are still considered to be vessels since they were compared to every other sherd from the appropriate phase and site, and found to match none.

After matching, vessels were classified into existing ceramic types and wares whenever possible. Research has shown that despite various classification problems, ceramic types have considerable value as chronological and cultural indicators (Windes 1977; Warren 1979; Franklin 1980; Sudar-Laumbach 1980; inter alios). Since these are major areas of interest for the present research, type classifications are used in this study. Date ranges for the pottery types are those listed in Warren's pottery code guide (this volume). They generally follow Breternitz (1966), Breternitz, Rohn, and Morris (1974), Windes (1977), and Warren (1979: 188-197; 1982). Additional sources for dates are listed with the ceramic code (Appendix 19-2). Major sources for pottery type and ware information are listed in Table 19-3.

Ceramics were classified on the basis of visual inspection of surface finish and color, presence or absence of slip, paint color and type, design style, and rim form (when present). Gross temper categories (igneous rock, trachyte, sandstone, and sherd) were determined by examination of a fresh break under a 20x-40x binocular microscope. Temper was also part of the information used to determine ceramic type. Pottery was first classified to type by the author and later by Warren during the detailed temper analysis (this volume). Thus, two investigators concurred on the type designations. Descriptions of the major ceramic types found in the project areas are included in the following sections. Many sherds were too small (generally under fingernail size), weathered, or otherwise damaged to be typed. In addition, many utility ware body sherds and unpainted sections of white wares were not classifiable. These sherds were classified into the following categories:

1. Unidentified whiteware (mineral or carbon paint if paint was present).
2. Unidentified brownware.
3. Unidentified redware.
4. Unidentified grayware (plain, corrugated, or neckbanded)
5. Undifferentiated plainware.
6. Too small to identify.

These categories contain ca. 280 sherds, or 27.7% of the total 1,011 sherds. They also include ca. 166 vessels or 43.0% of the total 386 vessels. (Due to differences in placement of some brownwares and gray neckbanded wares, counts from Table 19-4 are slightly different from those discussed above.)

These categories constitute a sizeable percentage of the vessels since small, unidentifiable sherds are harder to match and thus count as single vessels more often than do larger sherds, which are classifiable and easier to match. This is not an analytic problem, though. In cases where problems might arise, computations were performed on both sherd and vessel counts and the results compared.

When possible, all attributes except type were recorded on these unidentifiable pieces. They were excluded from analyses requiring type designation, but included in others such as the utility versus painted ware, and jar versus bowl form studies.

In addition to pottery type, a variety of other technological, stylistic, and functional attributes were recorded (see the pottery code guide in Appendix 19-2). These attributes were selected to address the questions concerning chronology, function, and the presence or absence of regional and local interaction. Attributes such as vessel form, rim form, orifice diameter, percent of rim present, and wall thickness all contribute to an understanding of vessel form and size that can be used to examine vessel function. (Franklin 1980: 402-402; Sudar-Laumbach 1980: 960-966, 1016-1018; Sebastian 1983: 409-419). Information describing slip, paint type and color, and design style can yield both chronological information and information concerning local or foreign manufacture (Warren 1979: 188-198; Franklin 1980: 88-94).

Tempering material, too, is an especially valuable source of information concerning local versus foreign manufacture, and location of production (Warren 1967, 1977a, 1977b, 1979). Warren conducted a detailed temper analysis and sourcing study on sherds selected to represent each of the identified types and major groups of unidentified wares from all appropriate Framington sites and isolated finds (this volume). Several sites with only one unidentififed sherd recovered during survey or

Table 19-3. Sources for Description of Pottery Types and Wares.

San Juan Whiteware and Grayware

Abel (1955); Swannack (1969); Rohn (1971); Breternitz, Rohn, and Morris (1974); Hayes and Lancaster (1975); Warren (1979)

Cibola Whiteware and Grayware

Hawley (1936, 1939); MNA Cibola Whiteware Conference (1958); Warren (1979; 1982)

Chuska Whiteware and Grayware

Peckham and Wilson (n.d.); Windes (1977); Warren (1979)

San Juan Redware

Abel (1955); Colton (1956); Breternitz, Rohn, and Morris (1974); Warren (1979)

White Mountain Redware

Carlson (1970); Warren (1979; 1982)

Jeddito Yellowware

Colton (1956)

Rio Grande Glazeware

Mera (1933, 1935); Warren (1977; 1982)

Brownwares

Eddy (1966); Warren (1986)

testing were not used in the study. Approximately 414 sherds, or 41.0% of the total, were included.

A limited refiring study was conducted to determine paste color after oxidation. This was undertaken primarily to serve as a basis for comparison with other studies from the surrounding area, and as a reference for future oxidation tests of ceramics from the region (Shepard 1939; Windes 1977; Franklin 1979a, 1979b, 1980; Sudar-Laumbach 1980; Perry 1980; Warren n.d.; Wilson 1985). Since this study emphasizes San Juan tradition ceramics due to their preponderance in the study areas, only San Juan types were selected for refiring analysis. This study follows Wilson (1985) in its goal of shedding light on interaction patterns within the area of the San Juan ceramic tradition. Forty-one sherds, or 4.1% of the total, were refired from the following types: Moccasin Gray, Mancos Gray, Mancos Corrugated, Mesa Verde Corrugated, Cortez Black-on-white, Mancos Black-on-white, McElmo Black-on-white, and Mesa Verde Black-on-white. Results of this analysis are discussed in the section on regional interaction. Detailed information on the refiring study is presented in Appendix 19-1.

Ceramic Traditions and Groups

Classification of sherds from the surveyed, tested, and excavated sites showed that the majority of ceramics from the project areas belong to the San Juan ceramic tradition. Mancos Black-on-white, Mesa Verde Black-on-white, and McElmo Black-on-white are the most common whitewares. Mancos Corrugated, Mesa Verde Corrugated, and Mancos Gray are the most commonly represented graywares. The preponderance of San Juan ceramics is not surprising considering the location of the study areas north of the San Juan River. The Cibola ceramic tradition is represented by only one grayware vessel, while Chuska White and Graywares are repre-

Table 19-4. Ceramic Traditions and Wares From the Farmington Area.

Ceramic Tradition/Ware	Dates	Sherds	Percent	Vessels	Percent
San Juan Grayware		384	38.0	116	30.1
San Juan Whiteware		152	15.1	83	21.5
San Juan Redware		1	.1	1	.3
Chuska Grayware		22	2.2	7	1.8
Chuska Whiteware		3	.3	3	.8
Cibola Grayware		2	.2	1	.3
White Mountain Redware		1	.1	1	.3
Rio Grande Glazeware		1	.1	1	.3
Yellowware		5	.5	3	.8
Brownware		158	15.6	5	1.3
Subtotal		729	72.2	221	57.5
Unidentified Wares					
White Ware		72	7.1	47	12.2
Mineral Painted White Ware		6	.6	5	1.3
Carbon Painted White Ware		2	.2	2	.5
Red Ware		2	.2	2	.5
Gray Plain Ware		64	6.3	18	4.7
Gray Corrugated Ware		24	2.4	21	5.4
Gray Neckbanded Ware		1	.1	1	.3
Undifferentiated Plain Ware		97	9.6	55	14.2
Too Small to Identify		14	1.4	14	3.6
TOTAL		1,011	100.1	386	100.2

sented by ten vessels. Tables 19-4, 19-5, and 19-6 summarize the ceramic counts by type and ware for the study areas as a whole. Tables 19-8 and 19-9 list the pottery types and wares from each of the sites and isolated finds. The site table (Table 19-8) also gives date ranges and very brief descriptions for each of the surveyed, tested, and excavated sites containing ceramics.

Following Windes (1977) and Warren (1979), among others, the pottery was divided into ceramic groups (Table 19-7). The nine groups and their time periods are those adapted by Windes (1977: Table 10.2) for the CGP study area from groups originally developed by Peckham and Wilson (1964). The CGP study area lies to the south and west of the Farmington project areas. Consequently, Windes's groupings were modified to include the types found in the Elena Gallegos project areas. The Farmington ceramic groups emphasize the San Juan ceramic tradition types while the CGP groups emphasize Chuska ceramic tradition types (Windes 1977: Table 10.2). Table 19-7 lists only the types that occur in the Farmington areas for the time periods listed. Since the Farmington groupings are composed only of the types encountered in the project areas, they should be considered as heuristic devices applicable to the study areas only.

Another type of ceramic classification was devised by Whalley (1980), in her study of pottery from Salmon Ruin and larger sites in the San Juan area. It groups sites on the basis of varying percentages of San Juan pottery types. The majority of sites in the project areas do not have sufficient ceramics to use these kinds of groups. They are, however, helpful in understanding relationships within the area as a whole.

As discussed by Windes (1977: 281), ceramic groups can be used as an efficient means of organizing surveyed and tested sites into temporal groupings. This information is then used to characterize the occupation of an area in temporal terms. In the present case, the ceramic groups indicate that early Pueblo II times through early Pueblo III are most strongly represented in the project areas, with a decline in later Pueblo III. Basketmaker III and Pueblo I have a more sparse representation, but pottery from these periods is present on several sites (Table 19-10).

Table 19-5. Identified Utility Ware Types from the Farmington Area.

Type	Dates (A.D.)	Sherds	Percent	Vessels	Percent
Rosa Brown	600-750/850	1	.2	1	.8
Piedra Brown	700-950	153	26.9	2	1.6
Piedra Gray	700-1000	6	1.1	1	.8
Moccasin Gray	775-900	3	.5	1	.8
Mancos Gray	875-950	33	5.8	10	7.8
Mancos Gray/Mancos Corrugated		3	.5	3	2.3
Mancos Corrugated	900-1200	283	49.8	88	68.8
Mesa Verde Corrugated	1100-1300	56	9.9	12	9.4
Mancos Corrugated /Hovenweep Style		5	.9	1	.8
Hovenweep Corrugated	1250-1300	1	.2	1	.8
Tohatchi Banded	900-1050	2	.4	1	.8
Captain Tom Corrugated	875/900-1000	5	.9	3	2.3
Blue Shale Corrugated	925-1150	17	3.0	4	3.1
TOTAL		568	100.1	128	100.1

Ceramic Types

In this section, the most common ceramic types in the Farmington study areas are described. These descriptions serve as a basis for the present study, and as an aid to future studies of pottery from the area. San Juan Whitewares, Graywares, and Redwares are discussed in detail. Chuska Whitewares and Graywares, the brownwares, and types which occur in very minor percentages are briefly reviewed.

The counts and percentages of attributes used in the following type descriptions are calculated on the pottery vessels identified during matching. Sherds/vessels assigned to the "too small" category are not included. Rim orifice diameter estimates were made only if the rim portion present represented 5 percent or more of the total. Results of both the general and the detailed temper analyses (Warren, this volume) are included with the description for each type. Sources used for type descriptions, dates, and geographic ranges are listed in Table 19-3.

San Juan Ceramic Tradition

Pottery from the San Juan ceramic tradition consists of 537 sherds representing a minimum of 200 vessels. These vessels constitute 51.8 percent of the overall ceramic assemblage and include gray, white, and redwares. As discussed by Warren in the temper analysis (this volume), the most common tempering materials for the San Juan ceramics from the study areas are combinations of igneous rock, primarily hornblende and diorite porphyries from the gravel terraces along the San Juan River and its northern tributaries, and sherd. Sandstone is also present in certain types such as Mancos Black-on-white.

San Juan Grayware

San Juan Grayware consists of a minimum of 116 vessels, represented by 384 sherds. These vessels constitute 30.1% of the entire ceramic assemblage of 386 vessels (1011 sherds). The San Juan Grayware vessels make up 90.6% of the identifiable graywares from the Farmington areas. Mancos Corrugated (68.8%) is by far the most common utility ware type followed by Mesa Verde Corrugated (9.4%) and Mancos Gray (7.8%). Combination categories, such as Mancos Gray/Mancos Corrugated, are not discussed below.

Table 19-6. Identified Painted Ware (and Miscellaneous) Types from the Farmington Area.

Type	Dates (A.D.)	Sherds	Percent	Vessels	Percent
Chapin B/w	575-750	1	.6	1	1.1
Cortez B/w	900-1075	7	4.3	2	2.2
Mancos B/w	950-1150+	102	62.6	58	63.0
McElmo B/w	1050-1300+	14	8.6	11	12.0
Mesa Verde B/w	1150(?)-1300+	28	17.2	11	12.0
Naschitti B/w	900-1000	1	.6	1	1.1
Nava B/w	1100-1300	2	1.2	2	2.2
Bluff B/r	750-900	1	.6	1	1.1
Wingate B/r	1050-1200	1	.6	1	1.1
Yellowware	1300(?)-present	5	3.1	3	3.3
Kotyiti G/r	1600-1650+	1	.6	1	1.1
TOTAL		163	100.0	92	100.2

Table 19-7. Ceramic Groups.

Group	Period	Ceramic Types
1	AD 500-750	Chapin B/w
		Rosa Brown
		Piedra Brown
		Piedra Gray
2	750-800	Bluff B/r
		Rosa Brown
		Piedra Brown
		Piedra Gray
		Moccasin Gray
3	800-875	Bluff B/r
		Rosa Brown
		Piedra Brown
		Piedra Gray
		Moccasin Gray
4	875-950	Bluff B/r
		Cortez B/w
		Naschitti B/w
		Piedra Brown
		Piedra Gray
		Moccasin Gray
		Mancos Gray
		Tohatchi Banded
		Captain Tom Corrugated
		Mancos Corrugated
		Blue Shale Corrugated
5	950-1000	Cortez B/w
		Naschitti B/w
		Mancos B/w
		Piedra Gray
		Tohatchi Banded
		Captain Tom Corrugated
		Mancos Corrugated
		Blue Shale Corrugated
6	1000-1075	Cortez B/w
		Mancos B/w
		McElmo B/w
		Wingate B/r
		Tohatchi Banded
		Mancos Corrugated
		Blue Shale Corrugated
7	1075-1125	Mancos B/w
		McElmo B/w
		Nava B/w
		Wingate B/r
		Mancos Corrugated
		Blue Shale Corrugated
		Mesa Verde Corrugated
8	1125-1200	Mancos B/w
		McElmo B/w
		Nava B/w
		Mesa Verde B/w
		Wingate B/r
		Mancos Corrugated
		Blue Shale Corrugated
		Mesa Verde Corrugated
9	1200-1325*	McElmo B/w
		Nava B/w
		Mesa Verde B/w
		Mesa Verde Corrugated
		Hovenweep Corrugated

*Mineral painted whitewares in the San Juan can date to A.D. 1300+.

Table 19-8. Summary of Ceramic Types, Wares, and Groups.

USFS NO.	Types and Wares	Sherds	Date Range (AD)	Ceramic Groups	Site Description
FA 1-1	Mesa Verde Corrugated	12	1100-1300	7-9	Lithic/groundstone/ ceramic scatter. Hearths & fire-cracked rock.
	Undifferentiated Plain	1			
	Total Sherds	13			Multicomponent
FA 1-2	Mancos Corrugated	1	900-1200	4-8	Lithic scatter with ground-stone concentrations and 1 sherd. Hearth & fire-cracked rock. Multicomponent
FA 1-5	Undifferentiated Whiteware	1			Lithic scatter with 1 sherd. Hearth. Multicomponent
FA 1-6	Mancos B/w	37	950-1150	4-9	Pitstructure with lithics, groundstone, and ceramics. Multicomponent.
	McElmo B/w	4	1050-1300		
	Kotyiti G/r	1	1600-1650		
	Mancos Corrugated	89	900-1200		
	Blue Shale Corrugated	14	925-1150		
	Mesa Verde Corrugated	44	1100-1300		
	Mineral Whiteware	1			
	Carbon Whiteware	1			
	Undifferentiated Whiteware	26			
	Undifferentiated Redware	1			
	Corrugated Indented Oblique Left	7			
	Corrugated Indented Oblique Right	3			
	Corrugated Indented Undifferentiated	7			
	Undifferentiated Corrugated	2			
	Neckbanded (5mm.+)	1			
	Gray Plain Smooth	16			
	Undifferentiated Plain	35			
	Too Small to Identify	11			
	Total Sherds	300			
FA 2-6B	Mancos Corrugated	17	900-1200	4-8	Lithic/ceramic scatter. Hearth & fire-cracked rock. Multicomponent.

Table 19-8. Summary of Ceramic Types, Wares, and Groups (continued).

USFS NO.	Types and Wares	Sherds	Date Range (AD)	Ceramic Groups	Site Description
FA 2-7	Mancos B/w	1	950-1150	5-9	Lithic/groundstone/
	McElmo B/w	1	1050-1300		ceramic scatter.
	Mesa Verde B/w	7	1150-1300		Hearth & fire-cracked
	Jeddito B/y	1	1325-1600		rock.
	Jeddito Plain(?)	3	1300-present		Multicomponent.
	Undifferentiated Whiteware	2			
	Total Sherds	15			
FA 2-8	Rosa Brown	1	600-750/850	1-8	Lithic/groundstone/
	Piedra Brown	153	700-950		ceramic scatter.
	Mancos Gray	1	875-950		Hearths & fire-cracked
	Mancos Corrugated	8	900-1200		rock.
	Corrugated Indented Smeared	1			Multicomponent.
	Brown Plain Smooth	4			
	Total Sherds	168			
FA 2-9	Gray Plain Smooth	1			Lithic scatter with 1 sherd. Possible hearth.
FA 2-10	Undifferentiated Whiteware	2			Lithic/groundstone/ ceramic scatter
	Undifferentiated Plain	1			
	Total Sherds	3			
FA 2-11	Mancos B/w	1	950-1150	4-8	Lithic/ceramic scatter.
	Mancos Corrugated	1	900-1200		Hearths & firecracked rock.
	Total Sherds	2			
FA-2-16	Mesa Verde B/w	3	1150-1300	4-9	Small rock shelter with
	Mancos Gray	2	875-950		lithics & ceramics.
	Mancos Corrugated	6	900-1200		Petroglyph panel in
	Mineral Whiteware	1			apparent association.
	Carbon Whiteware	1			Hearths & fire-cracked
	Undifferentiated Whiteware	4			rock. Multicomponent.
	Gray Plain Smooth	39			
	Total Sherds	56			
FA 2-17	Mancos Corrugated	1	900-1200	4-8	Lithic scatter with 1 sherd. Fire-cracked rock. Probably multicomponent

Table 19-8. Summary of Ceramic Types, Wares, and Groups (continued).

USFS NO.	Types and Wares	Sherds	Date Range (AD)	Ceramic Groups	Site Description
FA 2-19	Mancos B/w	20	950-1150	5-8	Lithic/groundstone/ ceramic scatter.
	Mineral Whiteware	1			
	Total Sherds	21			
FA 3-3	Naschitti B/w	1	900-1000	4-9	Pitstructure with lithics, groundstone, & ceramics. Hearths, fire-cracked rock and roasting pits.
	Cortez B/w	7	900-1075		
	McElmo B/w	1	1050-1300		
	Nava B/w	1	1100-1300		
	Mancos Gray	30	875-950		
	Mancos Gray/Mancos Corrugated	3			Multicomponent.
	Capt.Tom Corrugated	4	875/900-1000		
	Tohatchi Banded	2	900-1050		
	Mancos Corrugated	87	900-1200		
	Mancos Corrugated/ Hovenweep Style	5			
	Blue Shale Corrugated	2	925-1150		
	Undifferentiated Whiteware	14			
	Corrugated Indented Oblique	1			
	Corrugated Indented Ribbed	1			
	Corrugated Clapboard (5mm.+)	1			
	Undifferentiated Plain	59			
	Too Small to Identify	3			
	Total Sherds	222			
FA 3-4	Mancos B/w	1	950-1150	5-9	Possible check dam with ceramics.
	Nava B/w	1	1100-1300		
	Undifferentiated Whiteware	1			
	Total Sherds	3			
FA 3-5	Mancos B/w	1	950-1150	5-8	Petroglyph Panel with 1 sherd.
FA 3-6	Mancos Corrugated	10	900-1200	4-8	Lithic/groundstone/ ceramic scatter. Hearths & fire-cracked rock. Multicomponent.
FA 4-1	Wingate B/r	1	1050-1200	4-9	Lithic/ceramic scatter.
	Mesa Verde/w	5	1150-1300		
	Mancos Corrugated	8	900-1200		
	Total sherds	14			

Table 19-8. Summary of Ceramic Types, Wares, and Groups (continued).

USFS NO.	Types and Wares	Sherds	Date Range (AD)	Ceramic Groups	Site Description
FA 4-2	McElmo B/w	2	1050-1300	4-9	Lithic/groundstone/ ceramic scatter.
	Mesa Verde B/w	7	1150-1300		
	Mancos Corrugated	1	900-1200		
	Total sherds	10			
FA 4-4	Piedra Gray	6	700-1000	1-5	Lithic/ceramic scatter.
FA 5-1	Hovenweep Corrugated	1	1250-1300	9	Lithic/groundstone scatter with 1 sherd.
FA 5-3	Mancos B/w	15	950-1150	2-8	Lithic/ceramic scatter. Multicomponent.
	Moccasin Gray	3	775-900		
	Mancos Corrugated	8	900-1200		
	Mineral Whiteware	1			
	Undifferentiated Whiteware	14			
	Polished Slipped Redware	1			
	Total sherds	42			
FA 6-1	Mesa Verde B/w	2	1150-1300	4-9	Lithic/groundstone/ ceramic scatter.
	Mancos Corrugated	6	900-1200		
	Total sherds	8			
FA 6-4	Mancos B/W	6	950-1150	4-8	Lithic/groundstone/ ceramic scatter.
	Capt. Tom Corrugated	1	875/900-1000		
	Mancos Corrugated	13	900-1200		
	Undifferentiated Whiteware	1			
	Total sherds	21			

Table 19-9. Summary of Ceramic Types and Groups Present on Isolated Finds.*

USFS Number	Major Types Present	Date Range	Ceramic Groups
FA 1-IF1	Mancos B/w	AD 950-1150	5-8
FA 1-IF2	Mancos B/w	950-1150	5-8
FA 1-IF5	Mancos B/w	950-1150	5-8
FA 1-IF11	Mancos B/w McElmo B/w	950-1150 1050-1300	5-9
FA 2-IF1	Mesa Verde B/w	1150-1300	8-9
FA 2-IF2	Mancos B/w	950-1150	5-8
FA 2-IF7	Yellowware	1300-present	
FA 2-IF9	McElmo B/w	1050-1300	6-9
FA 2-IF13	Mancos B/w	950-1150	5-8
FA 2-IF15	Mesa Verde B/w	1150-1300	8-9
FA 3-IF5	Mancos B/w	950-1150	5-8
FA 3-IF6	Chapin B/w	575-750	1-4
FA 3-IF10	Mancos Corrugated	900-1200	4-8
FA 3-IF13	Mancos Corrugated	900-1200	4-8
FA 3-IF19	Mancos Corrugated	900-1200	4-8
FA 3-IF23	Mancos Corrugated	900-1200	4-8
FA 5-IF2	Blue Shale Corrugated	925-1150	4-8
FA 6-IF2	McElmo B/w	1050-1300	6-9
FA 6-IF13	Mancos B/w	950-1150	5-8
FA 6-IF17	Mancos B/w	950-1150	5-8
FA 6-IF20	McElmo B/w	1050-1300	6-9
FA 6-IF21	Bluff B/r	750-900	2-4
FA 6-IF25	Mancos Corrugated	900-1200	4-8
FA 6-IF30	Mesa Verde B/w	1150-1300	8-9
FA 6-IF31	Mancos Corrugated	900-1200	4-8
FA 6-IF32	Mancos Corrugated Mancos B/w	900-1200 950-1150	4-8
FA 6-IF33	Mancos Corrugated	900-1200	4-8
FA 6-IF48	Mancos Corrugated	900-1200	4-8
FA 6-IF54	Mancos Corrugated	900-1200	4-8
FA 6-IF60	Mancos Corrugated	900-1200	4-8
FA 6-IF64	Mancos Corrugated Mancos B/w	900-1200 950-1150	4-8
FA 6-IF68	Mancos Corrugated	900-1200	4-8

* *Only the identifiable types from each isolated find are listed. Isolated finds with only unidentifiable wares are not included.*

Table 19-10. Ceramic Group Components on Sites and Isolated Finds.

Ceramic Group	BM III 1	Early PI 2	PI 3	Trans. PI-PII 4	Early PII 5	PII 6	Trans. PII PIII 7	Early PIII 8	PIII 9	Total
Number of Components:	3	5	5	31	42	44	45	48	17	240
Percent of Total Components	1.3	2.1	2.1	12.9	17.5	18.3	18.8	20.0	7.1	100.1

Moccasin Gray

Three sherds from one vessel of Moccasin Gray pottery with igneous rock temper (hornblende mica porphyry) were found on one site. The neck bands on this vessel are 13 mm. in width. This type dates from A.D. 775-900, with a geographical range that includes the northern drainages of the San Juan from the Animas/La Plata River valleys west to the Colorado River (Breternitz, Rohn, and Morris 1974).

Mancos Gray (Fig. 19-1)

Sample: 10 vessels, 33 sherds from 3 sites.

Construction: Coiling.

Temper: 90% of the vessels have igneous rock (quartz porphyry, hornblende porphyry) and 10% have sandstone. 80% of the vessels have no secondary temper, 10% have sandstone as secondary temper, and 10% have mica.

Wall thickness: Jars wall thickness ranges from 2-7 mm.

Rim Orifice Diameter: Jars orifice diameter ranges from 14-18cm., with a mean of 16cm. One small jar has an orifice diameter of 8 cm.

Surface:

Color: Interior- White to light gray, rarely tan or red. Most are light gray. Exterior- White to light gray, rarely gray-brown, tan or red. Most are light gray.

Spalling and Sooting: 10% of the vessels show spalling and 10% show sooting on the exterior.

Finish: Neckbanded exterior, remainder of exterior and interior scraped smooth.

Worked Sherds: None present.

Vessel Forms: 100% jars.

Rims: (4 vessels) Rims are fillet style. Vertical (50%), everted or flared (25%), and indeterminate (25%).

Manipulation of Coils: Vessels are neckbanded with bands consisting of unobliterated coils that are generally narrower than these of Moccasin Gray. Bands in this sample range from 3-10 mm.

One small form has an incised and punctate design on the banding of the rim.

Handles or Other Appendages: None present.

Time of Manufacture:

Period: Early Pueblo II.

Ceramic Group: 4

Dates: A.D. 875-950.

Range: Northern drainages of the San Juan River between the Animas/La Plata River valleys and the Abajo Mountains in Utah (Breternitz, Rohn, and Morris 1974).

Remarks: Mancos Gray occurs in the following percentages on sites with selected other types:

Mancos Corrugated — 100.0 Percent

Tohatchi Banded, Cortez B/w, — 33.3 Percent

McElmo B/w, Mesa Verde B/w,

Captain Tom Corrugated, Blue Shale

Corrugated, Naschitti B/w, Nava B/w

Thus, 33.3% of the sites with Mancos Gray vessels also have Tohatchi Banded Vessels. Many sites appear to be multicomponent, which may condition the occurrence of Mancos Gray with later types such as Mesa Verde B/w.

Figure 19-1. Sherds of Mancos Grey.

Small sample sizes, and occurrence on only a few sites, explain the high percentages seen here. This conclusion pertains as well to other types that occur as small samples on only a few sites.

Mancos Corrugated (Fig. 19-2)

Sample: 88 vessels; 283 sherds from 14 sites and 13 isolated finds.

Construction: Coiling.

Temper: 96.6% of the vessels have igneous rock (quartz porphyry, hornblende, biotite, or augite porphyry), 1.1% have metamorphic rock (quartzite), 1.1% have trachyte, and 1.1% have sherd as the major temper. 79% of the vessels have no secondary temper while 9.1% have mica, and 1.1% have quartz.

Wall Thickness: Jars: wall thickness ranges from 2-4 mm. at the small end and 10-12 mm. at the larger end.

Rim Orifice Diameter: Jars: orifice diameter ranges from 14 to 26 cm., with a mean of 19.2 cm.

Surface:

Color: Interior: Cream/white to dark gray. Some vessels are tan, red, or gray-brown. Most are light gray. Exterior: Cream/white to dark gray. Some vessels are tan, red, or gray-brown. Most are light gray.

Spalling and Sooting: 8.0% of the vessels show spalling and 1.1% show sooting on the exterior.

Finish: Coils are indented over the entire exterior surface or alternated with unindented coils. Rarely, lower portion of exterior is scraped smooth. Interior is scraped smooth.

Worked Sherds: None present.

Vessel Forms: 100% jars.

Rims: (15 vessels) Rims are fillet style. Vertical (80%) or slightly everted or flared (20%).

Manipulation of Coils: Indented corrugations cover the entire exterior surface of most vessels. 11.4% have smeared, indented corrugations while 1.1% have an incised design across the indented corrugations. Indentations are primarily diagonally aligned or finger-ridged. 1.1% have a smoothed, coil-free band around the center of the vessel. One rim has visible, flattened, unindented coils up to the vessel lip, and could also be classed as Mesa Verde Corrugated, as this variant is described for the later type (Breternitz, Rohn and Morris 1974.)

Handles or Other Appendages: None present.

Time of Manufacture:

Period: Pueblo II to early Pueblo III.

Ceramic Group: 4-8.

Dates: A.D. 900-1200.

Range: Northern drainages of the San Juan River between the Animas/La Plata River valleys and the Colorado River (Breternitz, Rohn, and Morris 1974).

Remarks: Mancos Corrugated is difficult to distinguish from Mesa Verde Corrugated when the rim is not present, or when a sufficient amount of vessel to determine body shape is not present (Breternitz, Rohn, and Morris 1974; Sudar-Laumbach 1980: 975). Everted rims, an egg-shaped body, and a narrower range of patterning in coil treatment, incision, and diagonal ridging differentiate Mesa Verde Corrugated from Mancos Corrugated (Breternitz, Rohn and Morris 1974). The tendency in the present study was to consider body sherds as Mancos Corrugated, unless they could clearly be identified as Mesa Verde Corrugated. Association with rims of the appropriate type is often used to classify body sherds. This orientation has undoubtedly inflated the count of Mancos Corrugated somewhat.

Mancos Corrugated occurs in the following percentages on sites with selected other types:

Tohatchi Banded, Mesa Verde Corrugated, Moccasin — 3.7%

Gray, Cortez B/w, Naschitti B/w, Nava B/w,

Wingate B/w

Blue Shale Corrugated, Captain Tom Corrugated — 7.4%

Mancos Gray, McElmo B/w — 11.1%

Mesa Verde B/w — 14.8%

Mancos B/w — 22.2%

Mesa Verde Corrugated (Fig. 19-3)

Sample: 12 vessels; 56 sherds from 2 sites.

Construction: Coiling.

Temper: 100% of the vessels have igneous rock (quartz porphyry, hornblende or augite porphyry) as the primary temper. 83.3% of the vessels have no secondary temper, while 16.7% have mica as the secondary temper.

Figure 19-2. Sherds of Mancos Corrugated.

Wall Thickness: Jars: wall thickness ranges from 5-7 mm.

Rim Orifice Diameter: Jars: unknown (rims are too small to take the orifice diameter measurement).

Surface:

Color: Interior: Cream/white to black. Most are light gray or tan. Exterior: Cream/white to dark gray. A few are tan. Most are light gray.

Spalling and Sooting: 8.3% of the vessels have spalling and none shows sooting.

Finish: Coils are undented over the entire exterior surface or alternated with unindented coils. Interior is scraped smooth.

Worked Sherds: None present.

Vessel Forms: 100% jars.

Rims: (3 vessels) Rims are fillet style. Everted or flared (66.7%) or vertical (33.3%).

Manipulation of Coils: Indented corrugations cover the entire exterior surface of most vessels. Indentations are primarily diagonally aligned. Flattening of coils is present on some examples.

Handles or Other Appendages: None present.

Time of Manufacture:

Period: Pueblo III.

Ceramic Group: 7-9.

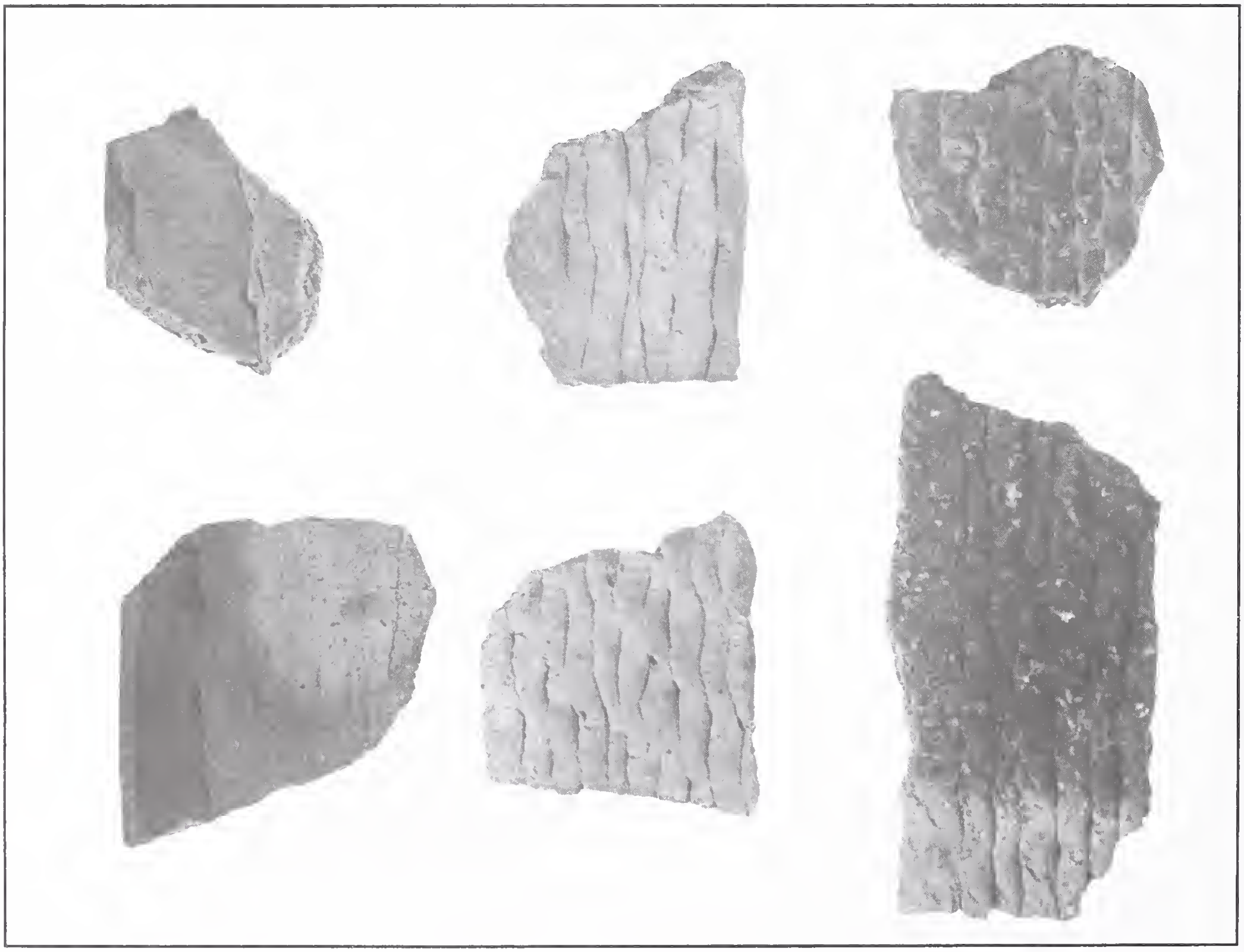


Figure 19-3. Sherds of Mesa Verde Corrugated.

Dates: A.D. 1100-1300.

Range: The northern drainages of the San Juan River between the Animas/La Plata River valleys and the Colorado River (Breternitz, Rohn, and Morris 1974).

Remarks: Mesa Verde Corrugated occurs in the following percentages on sites with selected other types:

- Mancos Corrugated — 50 %
- McElmo B/w
- Mancos B/w
- Blue Shale Corrugated
- Gallup B/w

The fact that Mesa Verde Corrugated occurs on only two sites is the reason for the high percentages seen above.

Hovenweep Corrugated

Two vessels, composed of 6 sherds, are uniformly pinched or crimped producing the squared, indented corrugations that are used by Abel (1955) to define Hovenweep Corrugated (A.D. 1250-1300). Breternitz, Rohn, and Morris (1974) consider this surface treatment to be simply a variant of Mesa Verde Corrugated. One of the vessels in the present sample has the bell-mouthed jar shape and the vertical (as opposed to everted) rim form of Mancos Corrugated.

Hovenweep Corrugated is described as being tempered with Dakota Sandstone (Abel 1955). The two vessels considered here are tempered with hornblende biotite porphyry and rhyolite, respectively. The vessels from the two Farmington sites could just as easily be classed as corrugation style variants of Mesa Verde Corrugated or Mancos Corrugated. They are maintained here as Hovenweep Corrugated, however, as that is how they were originally classified.

San Juan Whiteware

San Juan Whiteware is represented by a minimum of 83 vessels, identified among 152 sherds. These vessels constitute 21.5% of the entire ceramic assemblage, and 90.2% of the identifiable painted ware vessels from the project areas. Mancos Black-on-white is the most common of the identified painted wares with a total of 63.0%. McElmo Black-on-white and Mesa Verde Black-on-white follow with 12.0% each of the total of identified painted wares.

Chapin Black-on-white

One bowl sherd of Chapin Black-on-white was identified as an isolated find. It has igneous rock temper (light colored porphyry with quartz) and mineral paint with a flag motif. It is not slipped. This type dates from A.D. 575-750 with a range that includes the area north of the San Juan River from the Animas River westward to the Colorado River (Breternitz, Rohn, and Morris 1974).

Cortez Black-on-white (Fig. 19-4)

Seven sherds representing two vessels of Cortez Black-on-white were recovered from one site. One vessel is a dipper handle with Mesaverde Group sandstone and traces of trachyte as temper. It has black mineral paint in a design of multiple parallel lines and serrated triangles, and is represented by one sherd. The second vessel is a bowl form with crushed sherd and quartz temper, and is made up of six sherds. It has black mineral paint in a design of parallel lines and framed squiggles. Both vessels are slipped. Cortez Black-on-white dates from A.D. 900-1075 and has a distribution from the Durango, Colorado, area on the east to the area around the Abajo Mountains on the west, and from the San Juan River, in both New Mexico and Utah, to the south, to the Dolores River and Dove Creek to the north (Breternitz, Rohn and Morris 1974).

Mancos Black-on-white (Figs. 19-5a, 19-5b)

Sample: 58 vessels: 102 sherds from 8 sites and 11 isolated finds.

Construction: Coiling.

Temper: 36.2% of the vessels have sandstone (Mesaverde Group sandstone, undifferentiated sandstone), 34.5% have sherd, and 29.3% have igneous rock (andesite, hornblende diorite, quartz porphyry, hornblende or augite porphyry) as the major temper. 29.3% of the vessels have no secondary temper, 31.0% have sherd, 19.0% have igneous rock, 17.2% have quartz, and 3.4% are undeterminate with respect to secondary temper.

Wall Thickness: Jars: wall thickness ranges from 2-7 mm. Bowls: wall thickness ranges from 2-7 mm.

Rim Orifice Diameter: Jars: unknown (rims are too small to take the orifice diameter measurement). Bowls: orifice diameter ranges from minimum of 12 cm. to a maximum of 24 cm. with a mean of 18.6 cm.

Surface:

Color: <u>Interior</u>: cream/white to dark gray (jar interiors can be dark gray). Most are white. <u>Exterior</u>: cream/white to dark gray. Most are white.

Spalling and Sooting: 22.4% of the vessels show spalling and none shows sooting.

Finish: Interiors and exteriors scraped smooth.

Scraping marks can be observed on jar interiors. Jar exteriors, bowl interiors, and exteriors are usually well polished.

Slip: 54.4% of the vessels are not slipped. White to light gray slip was applied to 45.6% of the vessels. This is a higher percentage of unslipped

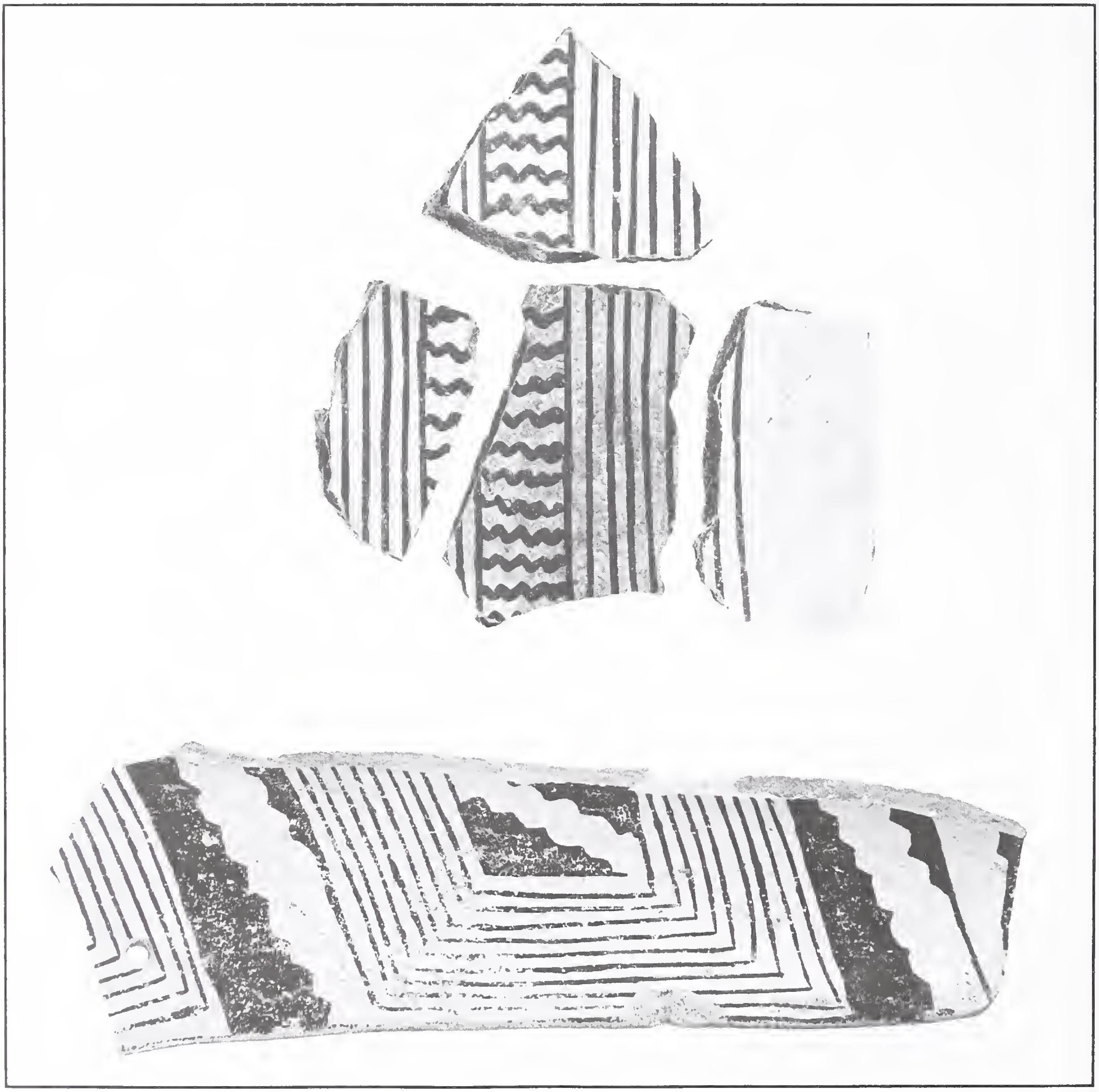


Figure 19-4. Sherds of Cortez Black-on-White.

vessels than is reported from other studies in the vicinity (Windes 1977: 333; Sudar-Laumbach 1980: 980) and is discussed by Warren in the detailed temper analysis report, (this volume), and in the section on regional interaction. Shepard (1939) states that it is almost impossible to identify a slip when its colors are similar to paste colors. This is the case with these ceramics.

Worked Sherds: Sherds with worked edges are present. Hematite is present on one worked edge.

Vessel Forms: 50.0% jars; 50.0% bowls.

Rims: (14 vessels) The 1 jar rim is indeterminate due to size and poor condition (7.1%). Bowl rims are stright and vertical with a rounded lip (21.4%) or tapered and vertical with a tapered lip (71.4%).

Handles on Other Appendages: None present.

Decoration:

Pigment: Mineral

Color: Black and light to dark brown are the most common colors, with occurrences of reddish brown, greenish brown, and greenish black. One glaze black piece was noted.

Design: Designs are located on jar exteriors, bowl interiors, and very infrequently on bowl exteriors (2 vessels).

Motifs consist of diagonal hatching or squiggles between fine, medium, or broad parallel framing lines. Checkerboard motif, steps and frets, acute triangles, pennants, sawteeth, and framed dots are also present. Parallel framing lines are generally fine to medium and are usually the same width as the hachure lines.

Four bowl rims have a solid painted line along the lip.

Time of Manufacture:

Period: Pueblo II and early Pueblo III.

Ceramic Group: 5-8.

Dates: A.D. 950-1150+.

Range: Distribution is from the Durango, Colorado area on the east to the area around the Abajo Mountains on the west; and between the San Juan River, in both New Mexico and Utah to the south, and the Dolores River and Dove Creek to the north (Breternitz, Rohn, and Morris 1974).

Remarks: Mancos Black-on-white is by far the most common decorated pottery type in the Farmington project area.

There are, however, difficulties in separating certain sherds of Mancos Black-on-white from Cibola Whitewares such as Gallup Black-on-white. The distinction between Mancos B/w and Gallup B/w, in particular, is difficult when hachure motifs are present, and when the sherds are so small or weathered that the extent of surface polishing and paint type and color, are not apparent. Mancos B/w tends to be more highly polished than Gallup B/w (Warren 1979: 206; Warren n.d.). In addition, Cibola wares such as Gallup B/w usually have black mineral paint while San Juan wares often have paint ranging from black to greenish black and from brown to red-brown (Warren n.d.). These attributes can be used to help distinguish the types when sherds of sufficient size and good condition are present.

Temper is usually relied upon as a primary means of separating pottery types of the two ceramic traditions. Temper is not always helpful, however. Sherd and sand, or sandstone, are commonly associated with Cibola wares while igneous rock is the temper normally associated with San Juan wares. Sherd and sandstone temper can also be found in San Juan wares, however, (Breternitz, Rohn, and Morris 1974; Warren 1979: 201-205), and is often found in pottery along the San Juan River that is classified as part of the San Juan ceramic tradition (Shepherd 1939: 278, 283; Warren n.d.).

These problems can make separating types such as Mancos B/w from Gallup B/w difficult. A few of the vessels classified as Mancos Black-on-white in this study have sherd and sandstone temper, and are small and weathered. Thus, it is possible that the Mancos Black-on-white count is somewhat inflated and may include a small number of vessels that should more properly be classified as Gallup Black-on-white.

Mancos B/w occurs on sites with selected other types in the following percentages:

Mesa Verde Corrugated, — 5.3%

Moccasin Gray, Mesa Verde B/w,

Blue Shale Corrugated,

Captain Tom Corrugated, Nava B/w

McElmo B/w — 15.8%

Mancos Corrugated — 31.6%

McElmo Black-on-white (Fig. 19-6)

Sample: 11 vessels, 14 sherds from 4 sites and 4 isolated finds.

Construction: Coiling.

Temper: 45.5% of the vessels have sherd, 36.4% have igneous rock (hornblende diorite, hornblende porphyry), and 18.2% have sandstone as the major temper. 27.3% of the vessels have no secondary temper, 45.5% have igneous rock, 18.2% have sherd, and 9.1% have mica.

Wall Thickness: Jars: wall thickness ranges from 5-7 mm. Bowls: wall thickness ranges from 5-7 mm.

Rim Orifice Diameter: Jars: no rims present. Bowls: orifice diameter ranges from a minimum of 16 cm. to a maximum of 20 cm., with a mean of 18 cm.

Surface:

Color: Interior: White to dark gray. Most are light gray. Exterior: White to dark gray. Mostare white or light gray.

Spalling and Sooting: 36.4% of the vessels have spalling. None has sooting.

Finish: Interiors and exteriors scraped smooth.

Scraping marks can be observed on jar interiors. Jar exteriors, bowl interiors, and exteriors are generally polished.

Slip: 63.6% of the vessels are not slipped. White slip with some crackling is present on 36.4% of the sample. The sample of 11 vessels is quite small and several of them are in poor condition, which makes identification of slip difficult.

Worked Sherds: None present.

Vessel Forms: 18.2% jars. 81.8% bowls.

Rims: (5 vessels) The five vessels with rims are all bowl forms. The rims are straight and vertical with a rounded lip (20.0%), straight and vertical with a squared lip (20.0%), and tapered and vertical with a tapered lip (60.0%).

Handles or Other Appendages: None present.

Decoration:

Pigment: Carbon (90.9%) and mineral (9.1%).

Color: Dense black to grayish black. The mineral painted example is brownish in color.

Design: Designs are located on jar exteriors and bowl interiors. There are no examples of designs on bowl exteriors in this sample. Motifs consist of diagonal hatching between parallel framing lines, other framed elements, broad lines in the Sosi style, uneven, vertical lines pendant from the rim, and sawteeth. Three bowl rims have a solid black painted line along the lip.

Time of Manufacture:

Period: Pueblo III.

Ceramic Group: 6-9.

Dates: A.D. 1050-1300+.

Range: The region bounded by Durango, Colorado, the San Juan River, the Colorado River in Utah, and the Dolores River in Colorado (Breternitz, Rohn, and Morris 1974).

Remarks: McElmo Black-on-white occurs in the following percentages on sites with selected other types.

Tohatchi Banded, Mancos Gray, — 12.5%
Mesa Verde Corrugated, Cortez B/w,
Captain Tom Corrugated, Naschitti B/w, Nava B/w
Mesa Verde B/w, Blue Shale Corrugated — 25.0%
Mancos Corrugated, Mancos B/w — 37.5%

Mesa Verde Black-on-white (Fig. 19-7)

Sample: 11 vessels; 28 sherds from 5 sites and 3 isolated finds.

Construction: Coiling.

Temper: 90.9% of the vessels have igneous rock (andesite, hornblende, hornblende porphyry, light colored porphyry with quartz) and 9.1% have sherd as the primary temper. 63.6% have no secondary temper, 18.2% have mica, 9.1% have quartz, and 9.1% have igneous rock.

Wall Thickness: Jars: wall thickness ranges from 5-7 mm. Bowls:wall thickness ranges from 5-9 mm.

Rim Orifice Diameter: Jars: no rims present. Bowls: orifice diameter is 22 cm. for the measureable rims present.

Surface:

Color: Interior: White to light gray. Most are white. Exterior: White to light gray. Most are white.

Spalling and Sooting: 18.2% of the vessels show spalling; none shows sooting.

Finish: Interiors and exteriors scraped smooth. Scraping marks are not apparent on the few jars present. Jar exteriors, and bowl interiors and exteriors, are well polished.

Slip: 9.1% of the vessels are not slipped. Thick white to light gray slip was applied to 90.9% of the vessels. Virtually all examples show some crackling.

Figure 19-5A. A sherd of Mancos Black-on-White.

Worked Sherds: None present.

Vessel Forms: 27.3% jars; 72.7% bowls.

Rims: (2 vessels) One bowl rim is straight and vertical with a rounded lip while the other is straight and vertical with a squared lip.

Handles or Other Appendages: None present.

Figure 19-5B. Sherds of Mancos Black-on-White.

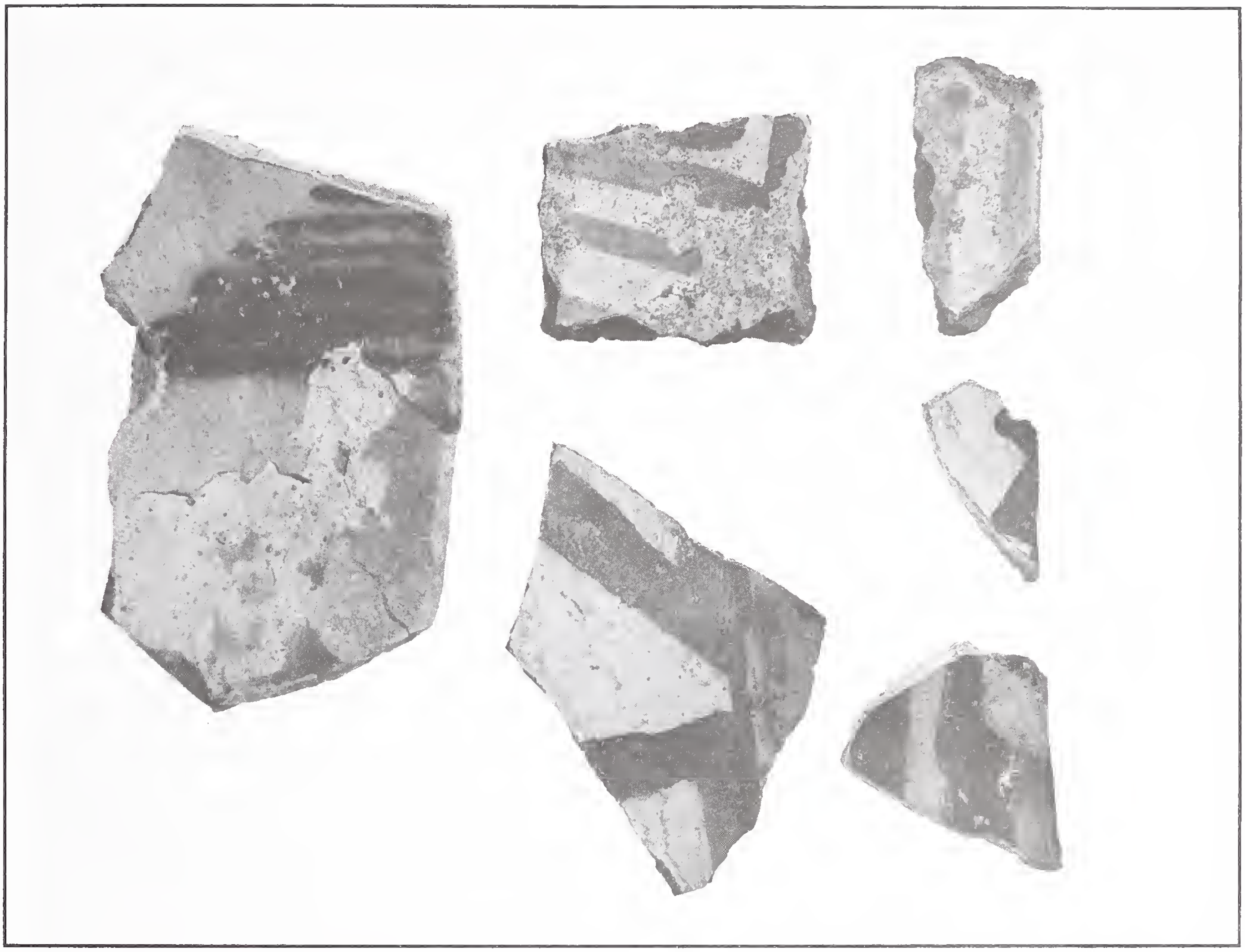


Figure 19-6. Sherds of McElmo Black-on-White.

Decoration:

Pigment: Carbon.

Color: Dense black to grayish black.

Design: Designs are located on jar exteriors, bowl interiors, and bowl exteriors (3 vessels).

Motifs consist of diagonal or straight line hatching framed by parallel lines. Framing lines can be either narrow, medium, or broad. Framed solids are also present, as are broad lines, pendant dots isolated dots, and sawteeth. Banding lines are also common, as discussed by Windes (1977:337). An open rectangle is present as a motif on a bowl exterior. What appears to be an alternating open rectangle-solid triangle motif is also an exterior motif.

One of the bowl rims has a solid black line along the lip. This is indeterminate on the other rim due to weathering.

Time of Manufacture:

Period: Pueblo III.

Ceramic Group: 8-9.

Dates: A.D.(?) 1150-1300+.

Range: The region bounded by Durango, Colorado, the San Juan River, the Colorado River in Utah, and the Dolores River in Colorado (Breternitz, Rohn, and Morris 1974).

Remarks: Mesa Verde Black-on-white occurs in the following percentages on sites with selected other types:

Mancos Gray, — 12.5%

Mancos B/w, Wingate B/r
McElmo B/w — 25.0%
Mancos Corrugated — 50.0%

San Juan Redware

Only four redware sherds were found in the Farmington areas that were examined. Two of these are unidentifiable as to ceramic tradition, one is a White Mountain Redware, and the other is a San Juan Redware. The San Juan Redware consists of one vessel made up of one sherd. It constitutes 0.3% of the entire ceramic assemblage, and 1.1% of the identifiable painted ware vessels.

Bluff Black-on-red (Fig. 19-8)

The one San Juan Redware vessel is a Bluff Black-on-red bowl form that occurred as an isolated find. It has crushed sherd and quartz temper, and black mineral paint in a large triangle design. The sherd is unslipped. This type dates from A.D. 750-900 with a range that includes the northern draingages of the San Juan River, from the Animas River Valley westward to the Colorado River (Breternitz, Rohn, and Morris 1974).

Chuska Ceramic Tradition

Pottery from the Chuska ceramic tradition consists of 10 vessels composed of 25 sherds. These vessels constitute

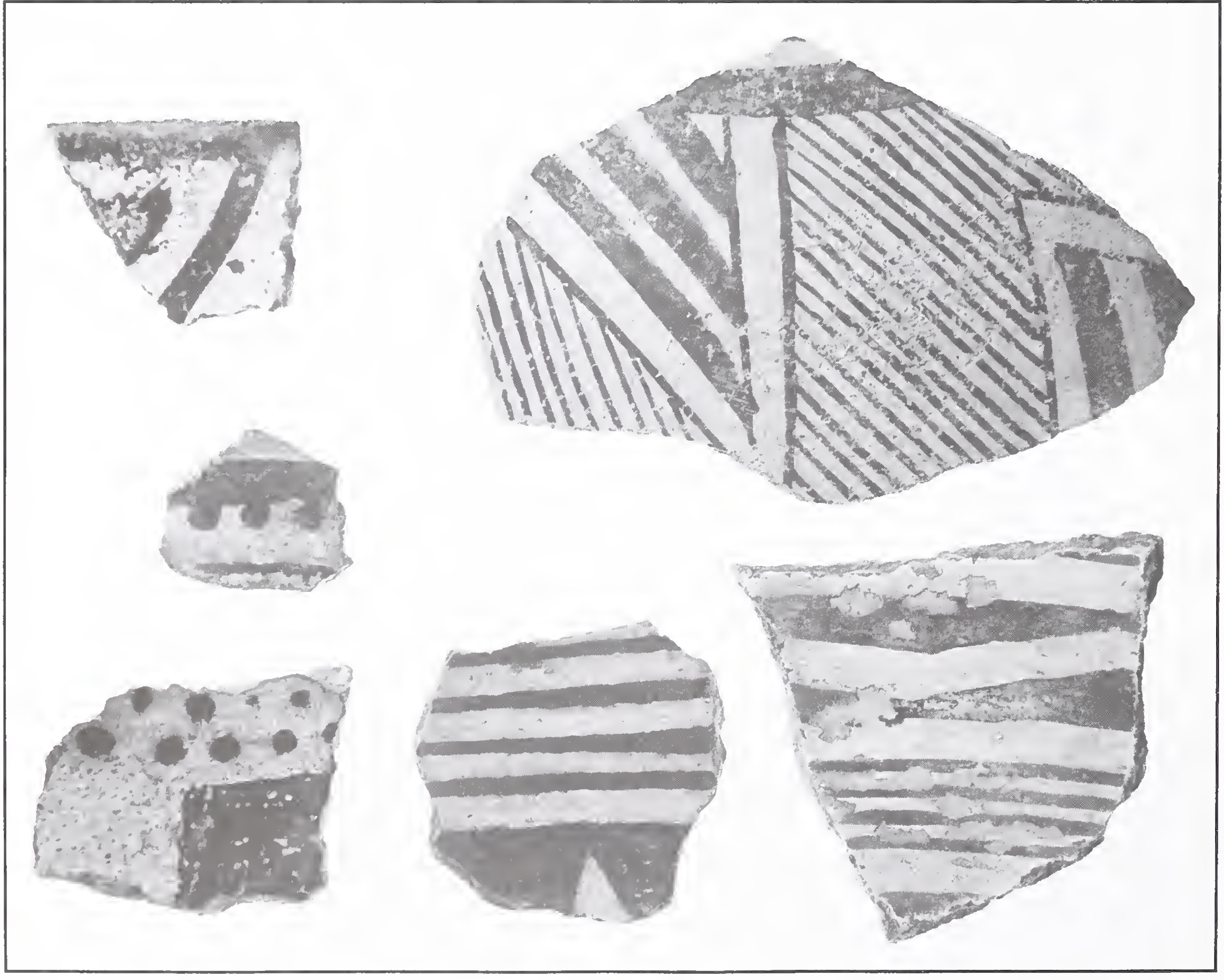


Figure 19-7. Sherds of Mesa Verde Black-on-White.

2.6% of the overall ceramic assemblage, and include gray and whitewares. The Chuska ceramic series is discussed in detail by Peckham and Wilson (1964) and in Windes (1977: 299-328, 358-369). It is recognized primarily on the basis of its distinctive tempering material, trachyte.

Readily identifiable Chuska types in the project areas are scant, so the "unclassifiable" categories were checked to determine if trachyte-tempered sherds were being overlooked in these categories. Only seven sherds were found: four unidentifiable plain graywares and three unidentifiable whiteware sherds. These seven sherds occur on two of the sites where identifiable Chuska Ware types also occur and may be related to these vessels. In addition, one isolated find coded as Mancos Corrugated is trachyte tempered and probably should be classed as Blue Shale Corrugated. Even with the addition of these sherds, the Chuska presence in the study areas is minor.

Chuska Grayware

Chuska Grayware has 7 vessels of 22 sherds and makes up 1.8% of the entire ceramic assemblage. The Chuska Grayware vessels are 5.5% of the total of identifiable gray wares.

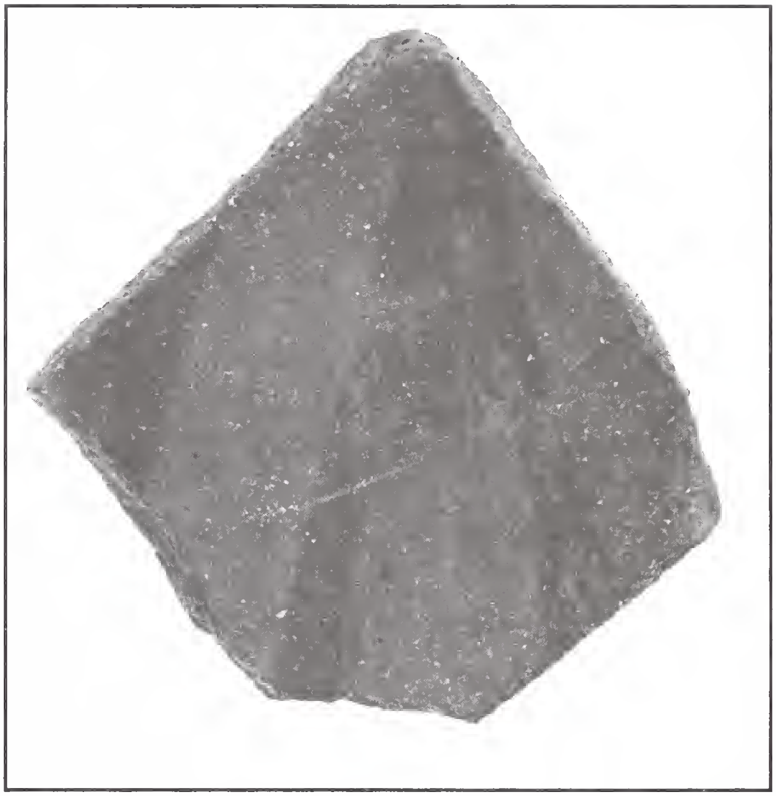


Figure 19-8. A sherd of Buff Black-on-Red.

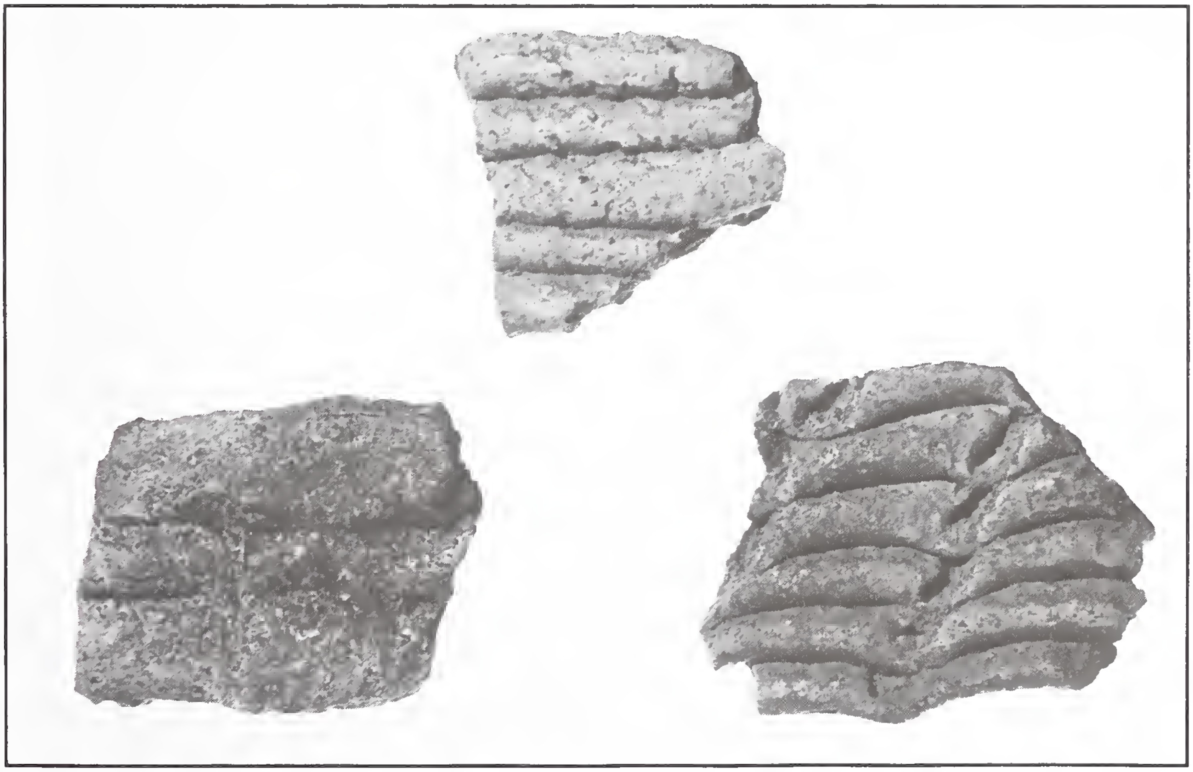


Figure 19-9. Sherds of Captain Tom Corrugated.

Captain Tom Corrugated (Fig. 19-9)

Sample: 3 vessels; 5 sherds from 2 sites.

Construction: Coiling.

Temper: 100.0% of the vessels have trachyte as the main temper and no secondary temper.

Wall Thickness: Jars: wall thickness ranges from 5-7mm.

Rim Orifice Diameter: Jars: unknown (measureable rims are not present in the sample).

Surface:

Color: <u>Interior</u>-Light gray. <u>Exterior</u>-Light gray.

Spalling and Sooting: 33.3% of the vessels show spalling and none show sooting.

Finish: Neckbanded exterior, remainder of exterior and interior scraped smooth.

Worked Sherds: None present.

Vessel Forms: 100% jars.

Rims: None present.

Manipulation of Coils: Vessels are neckbanded with bands consisting of unobliterated coils that are generally fairly narrow and within the range of the coil width of Mancos Gray. Bands in this sample range from 3-8 mm. One form has lines incised vertically down the coils. The lines are separated by approximately 9 mm. The other vessel has each coil punched so that a diagonal line of punctations is formed. The lines of punctations are separated by approximately 10 mm.

Handles or Other Appendages: None present.

Time of Manufacture:

Period: Late Pueblo I to Early Pueblo II.

Ceramic Group: 4-5.

Dates: A.D. 875/900-1000.

Range: Chuska Valley, east to Chaco Canyon, north to the San Juan River, possibly southwest to Ganado, and west into the Chinle Valley (Windes 1977).

Remarks: Captain Tom Corrugated is the trachyte tempered version of Mancos Gray in the San Juan tradition (Windes 1977: 305). Basal portions are scraped smooth as is the case with other neckbanded types. The site that has two Captain Tom Corrugated vessels also has four plain gray ware sherds with trachyte temper. These are probably basal portions of Captain Tom vessels.

Captain Tom Corrugated occurs in the following percentages on sites with selected other types.

Mancos Gray, Tohatchi Banded, — 50%

Blue Shale Corrugated, Cortez B/w,

Mancos B/w, McElmo B/w, Naschitti B/w,

Nava B/w

Mancos Corrugated — 100%

The small sample of Captain Tom, and the fact that it only occurred on two sites, influenced these high percentages.

Blue Shale Corrugated (Fig. 19-10)

Sample: 4 vessels; 17 sherds from 2 sites and 1 isolated find.

Construction: Coiling.

Temper: 100.0% of the vessels have trachyte as the major temper. 75.0% have no secondary temper while 25.0% have quartz.

Wall Thickness: Jars: wall thickness is 5-7 mm.

Rim Orifice Diameter: Jars: unknown. (No rims are present in the sample).

Surface:

Color: <u>Interior</u>-Light gray, dark gray. and gray-brown. <u>Exterior</u>-Light gray and gray-brown.

Spalling and Sooting: No vessels have spalling or sooting.

Finish: As far as can be determined from this sample, coils are indented over the entire exterior surface. Indentations can be diagonally aligned. Interior is scraped smooth.

Worked Sherds: None present.

Vessel Forms: 100% jars.

Rims: None present.

Manipulation of Coils: Indented corrugations cover the entire vessel surface, as far as can be determined from the vessels in this sample. Indentations are diagonally aligned in some cases. No patterning or incision is present, but the sample is very small. Coil width ranges around 4-6 mm.

Handles or Other Appendages: None present.

Time of Manufacture:

Period: Pueblo II to early Pueblo III.

Ceramic Group: 4-8.

Dates: A.D. 925-1150.

Range: Chuska Valley, east to Chaco Canyon, north to the San Juan River, southwest to Ganado, and west into the Chinle Valley (Windes 1977).

Remarks: Blue Shale Corrugated is comparable to Mancos Corrugated in the San Juan tradition (Windes 1977: 307).

Blue Shale Corrugated occurs in the following percentages on sites with selected other types:

Tohatchi Banded, Mancos Gray, Mesa Verde — 33.3%

Corrugated, Cortez B/w, Mancos B/w,

Captain Tom Corrugated, Naschitti B/w,

Nava B/w

Mancos Corrugated, McElmo B/w — 66.7%

The small sample and low number of sites on which Blue Shale occurs has resulted in these percentages.

Chuska Whiteware

Chuska Whitewares are represented by three sherds which form three vessels. They make up 0.8% of the entire assemblage. The Chuska Whiteware vessels are 3.3% of the identifiable painted wares.

Naschitti Black-on-White

One sherd of Naschitti Black-on-white was identified on one site. It has trachyte as the principal temper with fine quartz grains as secondary temper. The sherd has a white slip and black mineral paint in a sawtooth design with a black line along the top of the lip. It is from a bowl form and is extremely small. This type dates from A.D. 900-1000 and ranges from the Chuska Valley, east to Chaco Canyon, and north to the San Juan River (Windes 1977).

Nava Black-on-white (Fig. 19-11)

Two sherds comprising two vessels of Nava Black-on-White were found on two sites. One vessel is from a bowl form, and has trachyte temper and a white slip. It has black carbon paint in a design

Figure 19-10. Sherds of Blue Shale Corrugated.

of medium parallel lines. The other vessel is from a jar, and has trachyte with sherd temper and a white slip. It has black carbon paint in a broad line design. This type dates from A.D. 1100-1300 and ranges from the Chuska Valley, east to Chaco Canyon, north to the San Juan River, probably south to Ganado, and west to the Chinle Valley (Windes 1977).

Cibola Ceramic Tradition

There is a very scant occurrence of identifiable Cibola tradition ceramics, representing pottery from the Gallup/Chaco area, in the Farmington project area. Two sherds of Tohatchi Banded from one vessel were found on one site. This vessel represents 0.3% of the overall ceramic assemblage and 0.8% of the identifiable utility wares. The sherds from this vessel are small and tempered with sandstone. Tohatchi Banded was produced from A.D. 900-1050.

The problems with separating some of the Cibola Whitewares, such as Gallup Black-on-white, from San Juan White Wares like Mancos Black-on-white, have been discussed previously under the section describing Mancos Black-on-white. These problems, and the general lack of identifiable Cibola White Wares in the study areas, will be dealt with in greater detail in later sections concerning regional interaction and relationships.

White Mountain Redware

One sherd of White Mountain Redware, Wingate Black-on-red (A.D. 1050-1200), was found on one site. It represents a pottery tradition from the Puerco River region of east-central Arizona and west-central New Mexico. This vessel constitutes 0.3% of all the ceramics and 1.1% of the identifiable painted wares. It is from a bowl form, has sherd temper, black carbon paint in a hachure motif, and a worked edge.

Brownwares and Other Utility Wares

There are a total of 160 sherds representing 4 vessels from brown and gray ware types present in the Navajo Reservoir District and discussed by Eddy (1966). These types occur on two sites: Piedra Gray (6 sherds, 1 vessel) occurs on one site, while Rosa Brown (1 sherd, 1 vessel) and Piedra Brown (153 sherds, 2 vessels) occur together on the other. Together these types make up 1.0% of the total ceramic assemblage and 3.1% of the identifiable utility wares.

The Rosa Brown vessel dates from A.D. 600-750 or 850, is unslipped and unpolished, and is distinguished from

Figure 19-11. Sherds of Nava Black-on-White.

Piedra Brown on the basis of its sandstone temper. It is from a jar form, as are the two Piedra Brown vessels (Fig. 19-12). These are also unslipped and unpolished, but are tempered with igneous rock (light colored porphyry with quartz) and mica. Piedra Brown dates from A.D. 700-950. The Piedra Gray vessel is a jar form that is also unslipped and unpolished. It is tempered with sandstone and hornblende, and could realistically be classified as either Piedra Gray or Rosa Gray since the distinguishing factor is igneous rock (Piedra) versus sand (Rosa)

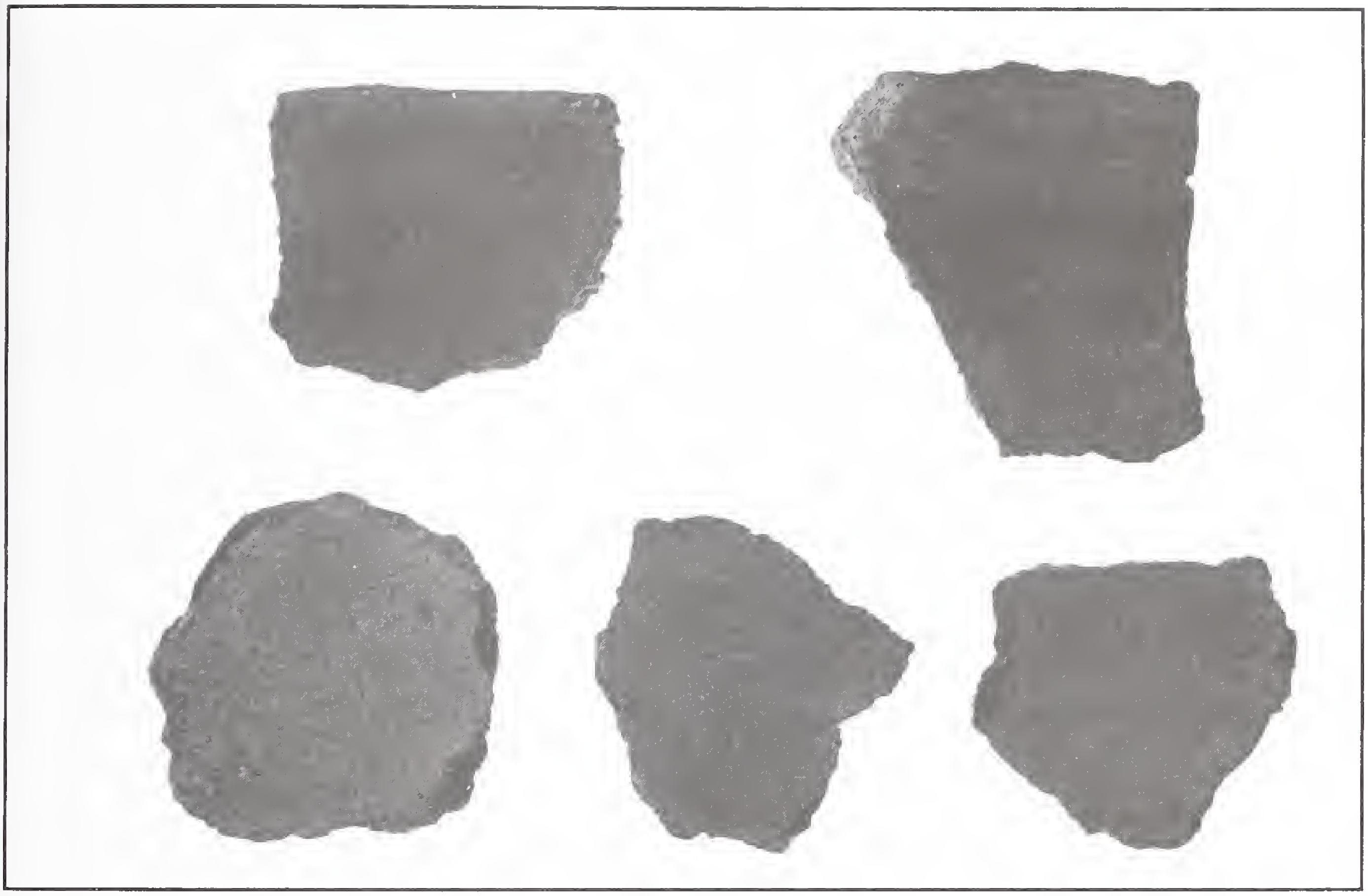


Figure 19-12. Sherds of Piedra Brown.

temper. Piedra Gray dates from A.D. 700-1000 while Rosa Gray dates from A.D. 600-900. The date ranges used for the above types are all drawn from the wide spans used in Eddy's ceramic groups (1966: 385, 450-453).

Miniature Grayware

An untyped, miniature grayware bowl (Fig. 19-13) was found during excavation in association with Mancos Corrugated. The vessel is unpolished and undecorated, and has an orifice diameter of approximately 5 cm. It is tempered with igneous rock (light colored porphyry with quartz, hornblende) and mica. Warren refers to it as a "test pot" or charm (this volume); it might also relate to the activities of children.

Other Wares

Five yellowware sherds, representing three vessels, and one late Rio Grande Glazeware sherd were found on two sites and one isolated find in the Farminton areas. These represent contact with the Hopi Mesas to the west and the Rio Grande to the east, and range in date from ca. A.D. 1300 to the present. One of the vessels is composed of three plain yellowware sherds, and is possibly Jeddito Plain, dated by Colton (1956) from A.D. 1300 to present.

These sherds are badly weathered, however, and could also form undecorated parts of a decorated yellowware vessel from the same site. The decorated sherd is also badly weathered and has reddish-brown paint in what appears to be a fine line motif. This sherd best fits the the description of Jeddito Black-on-yellow, which dates from A.D. 1325-1600 (Colton 1956). The four sherds are from jars, and are tempered with fine-grained sandstone and cream colored sherd fragments. The remaining vessel is a yellowware polychrome from an isolated find. It has reddish brown triangles outlined in black with a red painted line along the lip, and most closely resembles Colton's (1956) descriptions of the later polychromes such as Payupki Polychrome (A.D. 1700-

Figure 19-13. A miniature Grayware Bowl.

1800) or Walpi Polychrome (A.D. 1860 to present). It is tempered with hematitic sandstone.

The Rio Grande Glaze Ware is identified as a Kotyiti Glaze-on-red bowl tempered with Zia diabase. This type has a date range from A.D. 1600-1680 (Warren, this volume).

Patterns of Interaction and Function

Since the study of ceramic function is pertinent to understanding regional interaction, these topics will be discussed together. Information on site description and function can be found in the specific discussions of each tested or excavated site.

As noted earlier, by far the largest majority of ceramics in the study areas belong to the San Juan Ceramic tradition. According to Warren's temper analysis (this volume), the majority of these are tempered with materials available in the San Juan Valley. Some of them can be tied to the Farmington or Bloomfield areas of the valley. Other tempering materials are apparently from the La Plata Valley. The study of refired sherds from the project areas (Appendix 19-1) indicates that clays common to the San Juan, Animas, and La Plata valleys were in use. Thus, in the main, local ceramic production is indicated.

To explore local ceramic production and site interrelationships at a finer scale, the project area was subdivided into three rough geographic groupings, based on river valleys. This was done to determine if production in either the La Plata or the San Juan Valley could be ascertained from the Farmington sample.

Table 19-11 lists the geographic groupings and the sites that fall within these areas. Map 19-1 gives a general idea of where each grouping is located.

Site chronology and location with respect to the larger pueblos of the area will be examined for each of these groupings. In addition, ceramic type, and temper and clay sources will be noted. General site function as determined from site features and also from the kinds of ceramics present is studied. This information will be used to shed light on the questions presented in the Revised Research Framework (this volume) concerning the relationship of small sites to larger ones.

If smaller sites are related to the larger ones, they should show certain basic attributes. In general, they should be occupied during the time range of the larger sites and have similar pottery types and wares. Evidence of local production in the form of temper and clay would serve as an additional indication that the small sites are part of local patterns of interaction or mobility. As far as location is concerned, small, ephemeral sites in close proximity to a pueblo could indicate day-use sites (Sebastian 1983) while more distant sites with evidence of a longer-term occupation could be classed as campsites. None of these attributes guarantees a relationship between the small and large sites. A co-occurrence of them makes a stronger case for a relationship, however. Studies by Franklin (1980), Wilson (1985), and Whalley (1980) on ceramics from Salmon Ruin and other sites in the Middle San Juan Area (Whalley 1980) are used for this purpose.

Group I, in the uplands immediately north of Bloomfield in the vicinity of Salmon Ruin (Table 19-11 and Map 19-1), is represented by three sites with pottery.

All three of the sites were lithic and ceramic scatters; one also includes groundstone. One of the sites is not considered further as it falls before the initial occupation period of Salmon Ruin. On the basis of the ceramic type present (Piedra Gray), the site is PI-Early PII (Ceramic Groups 1-5, Tables 19-7, 19-8, and 19-10) with a

Table 19-11. Geographic Groups - Ceramics.

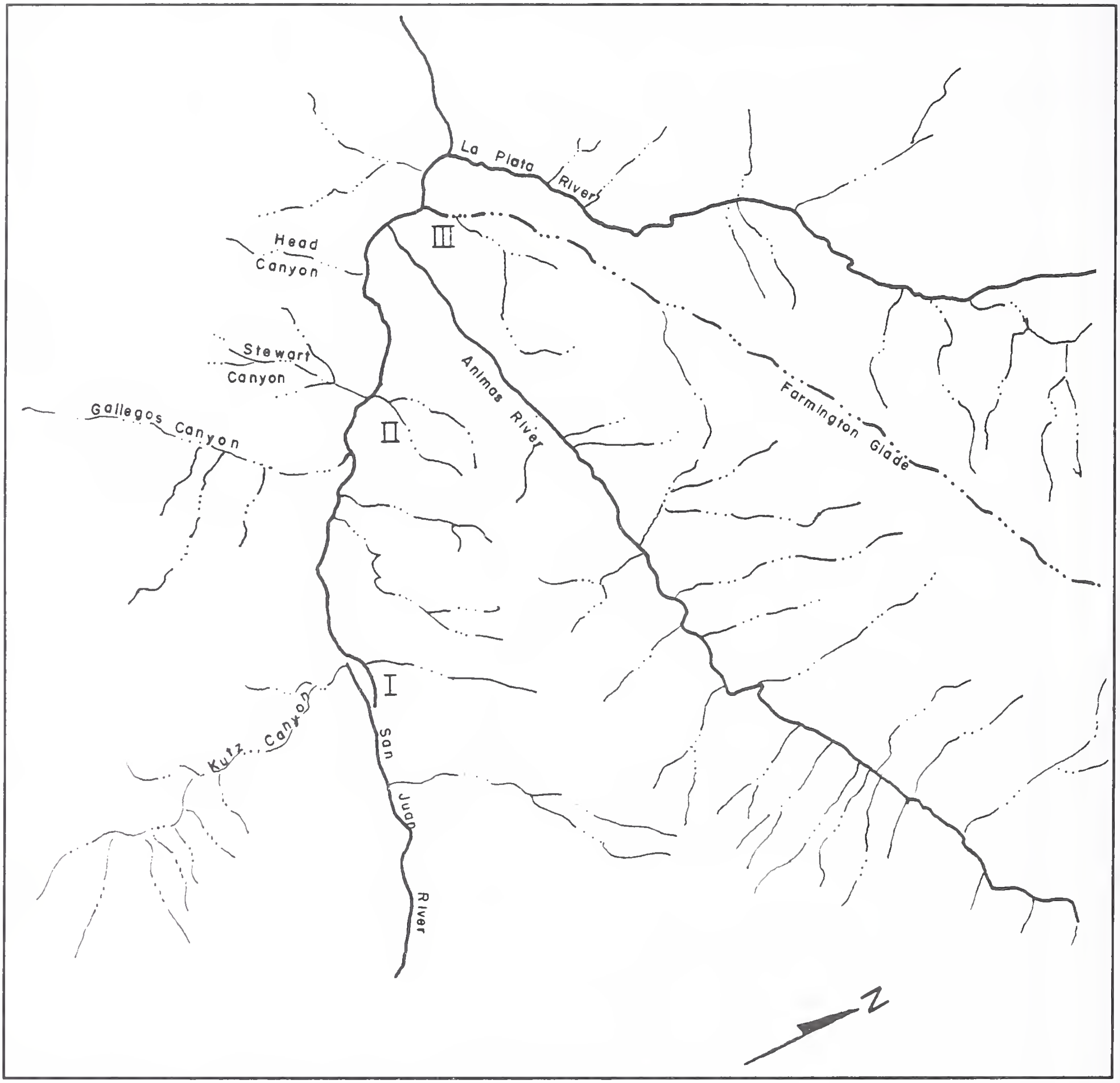
Group	Location	Sites	Isolated Finds
I	1.5 to 2.5 mi. (2.4 to 4 km.) north of Bloomfield, NM (Salmon Ruin)	FA 4-1, FA 4-2, FA 4-4	None
II	1 to 3 mi. (1.6 to 4.8 km.) north of the San Juan River and east of the Animas River 6 to 7 mi. (9.6 to 11.2 km.) west of Bloomfield, NM, and 8 to 10 mi. (12.8 to 16 km.) southwest of Aztec, NM (Aztec Ruin).	FA 2-16, FA 2-17, FA 2-19, FA 3-5, FA 3-6	FA 1-IF11, FA 2-IF9, FA 2-IF13, FA 2-IF15
III	North of the San Juan between the Animas and La Plata Rivers. Between 6 to 10 mi (9.6 to 16 km.) west of Aztec, NM. Between 5.5 and .5 mi. (8.8 to .8 km.) from the La Plata River.	FA 1-1, FA 1-2, FA 1-5, FA 1-6, FA 2-6, FA 2-7, FA 2-8, FA 2-9, FA 2-10, FA 2-11, FA 3-3, FA 3-4 FA 5-1, FA 5-3 FA 6-1, FA 6-4	FA 1-IF1, FA 1-IF2 FA 1-IF5, FA 2-IF1 FA 2-IF2, FA 2-IF7, FA 3-IF5, FA 3-IF6, FA 3-IF8, FA 3-IF10, FA 3-IF13, FA 3-IF19, FA 3-IF23, FA 5-IF2, FA 6-IF13, FA 6-IF17, FA 6-IF20, FA 6-IF21, FA 6-IF25, FA 6-IF30, FA 6-IF31, FA 6-IF32, FA 6-IF33, FA 6-IF48, FA 6-IF54, FA 6-IF60, FA 6-IF64, FA 6-IF68

maximum date range of A.D. 700-1000. The pottery from the site is similar to a gray ware from the Navajo Reservoir District to the east discussed by Eddy (1966), but was probably locally made (Warren, this volume). Other occurrences of brown and gray wares representing possible contact with the Navajo Reservoir District are reported from the area (Site FA 2-8; Warren 1986).

The other two sites contain ceramic assemblages indicating use or reuse throughout the Salmon occupation (Table 19-8). The Primary Occupation of Salmon was from A.D. 1088 to 1130 or 1150, the Intermediate from 1150 to 1200, and the Secondary from A.D. 1200-1275 (Franklin 1980). The types present on the Elena Gallegos Farmington sites range throughout these time periods (Ceramic Groups 4-9), and are consistent with the types present at Salmon Ruin and other sites in the area identified during the San Juan Valley Archaeological Project (SJVAP) (discussed in Whalley 1980). In general, Salmon Ruin and the sites identified by the SJVAP show a preponderance of San Juan tradition ceramics throughout all time periods. The earlier period, which corresponds to the Chacoan florescence or Primary Occupation of Salmon, contains higher percentages of intrusive wares, such as Cibolan and Chuskan wares. These decline in the later periods. San Juan ceramics are in the majority even in the early period, however. A comparison of a ceramic sample from the Aztec West Ruin to the Salmon Ceramics indicates that Aztec Ruin also follows this same pattern (Franklin 1978: 1-4).

Both Farmington sites contain Mesa Verde Black-on-white and corrugated wares. One contains a McElmo Black-on-white bowl with a tapered rim (which gives a narrower date range of A.D. 1050-1150 [Hayes 1964; Warren, this volume]), while the other contains an intrusive White Mountain Redware, Wingate Black-on-red. The San Juan tradition ceramics are common at Salmon while the White Mountain Redwares are distinctive among Salmon intrusives in that they are imported throughout all the occupations. They do not decline at the end of the Primary, or Chacoan, occupation as do the Chuskan and Cibolan intrusive wares (Wilson 1985: 16-17). The presence of Wingate Black-on-red and other ceramic types on a small site suggests that it was occupied by local groups related to the occupants of Salmon Ruin.

As noted, both McElmo Black-on-white and Mesa Verde Black-on-white are major types at Salmon, especially in the later time periods (Franklin 1980), and many of them may have been produced at the village. As discussed by



Map 19-1. Geographic groupings for ceramic analysis.

Wilson (1985), in a study of locally versus non-locally produced San Juan Wares from Salmon, many of the later, carbon-painted San Juan Wares, such as McElmo and Mesa Verde Black-on-whites, were apparently locally produced. They were either produced at Salmon itself or in the immediate vicinity.

Wilson's study (which is discussed in greater detail in Appendix 19-1) uses refiring of ceramic clay pastes and local clay sources in an attempt to determine if pottery was being made from local clays. Many other such studies have been conducted in the general San Juan region (Shepard 1939; Windes 1977; Franklin 1979a, 1979b, 1980; Perry 1980; Warren n.d.). Similarities in refired clay colors, among other attributes, can indicate whether the local clays were the source material for the ceramics. Wilson refired San Juan tradition ceramics from Salmon and clays from the San Juan, Animas, and La Plata River valleys. In brief, he found red and yellow-red firing clays to occur commonly in the San Juan and Animas Valleys in the environs of both Salmon and Aztec. Buff and yellow-red-buff firing clays occur more commonly in the La Plata Valley, with yellow-red-buff firing clay occurring very rarely in the San Juan Valley, too. Thus, San Juan tradition ceramics from Salmon that fire red or yellow-red could have been made locally. Those firing yellow-red-buff and especially buff were probably not manufactured at Salmon.

Wilson also found that certain other characteristics seemed to indicate pottery that was locally made. These are: igneous rock temper, carbon paint, and separate slip clay (1985: 98). Ceramics that Wilson feels are not local to Salmon Ruin include those with buff or yellow-red-buff firing clays, non-igneous rock temper, mineral paint, and no separate slip clay (1985: 98). These are generally the earlier San Juan Whitewares such as Cortez Black-on-white and Mancos Black-on-white. Warren (n.d.: 13) also found that mineral paint and sherd and rock temper indicate earlier types.

A limited refiring study was undertaken by the author on San Juan types from the Farmington area (Appendix 19-1) to serve as a companion to Warren's temper studies and to compare with Wilson's data. Only pertinent information from the study is noted here. A McElmo Black-on-white and two Mesa Verde Black-on-white sherds were refired from the two Group I sites. One of the Mesa Verdes and the McElmo showed yellow-red refired paste color, while the other Mesa Verde fired yellow-red-buff. As determined by Wilson's study (1985), the yellow-red paste color would indicate local production within the Salmon vicinity, while the yellow-red-buff firing paste would probably indicate non-local production. There are, however, Mesa Verde Black-on-white sherds that fire yellow-red-buff at Salmon. They are in the minority, though, and Wilson (1985) considers that they were probably not locally produced.

In general, ceramic types, refired clay color, and location indicate that the Group I small sites were probably associated with Salmon. They most likely represent day-use areas that were frequently reused.

Since these sites were identified during survey and were never tested or excavated, the pottery from the sites will not be studied in functional terms. As discussed earlier, surveyed sites were "grab" sampled, and it is not certain whether representative samples of both utility and decorated wares were obtained. Utility wares often tend to be underrepresented in such cases, and they are critical for functional studies (Sebastian 1983: 414-415). For this reason, only sites that were both surveyed and tested or excavated are used in functional studies based on ceramics.

When the temper source information is examined, parts of the above interpretation becomes problematical (Warren, this volume). Of the eight sherds studied from FA 4-1, four from a Mesa Verde Black-on-white bowl were tempered with materials that were probably from the La Plata Valley. The Wingate Black-on-red is intrusive and the other three sherds were tempered with San Juan Valley materials. The six sherds studied from FA 4-2 show a split between temper from the San Juan Valley and from the La Plata Valley. Thus, the temper source information is not completely indicative of production in the Salmon vicinity.

The presence of La Plata Valley temper would not normally indicate production in the Salmon vicinity. Wilson reviewed ethnographic research concerning the distances from which ceramic production materials are obtained (Wilson (1985:80; Arnold 1971, 1975, 1980, 1981; cf. Wilson 1985), and found that the majority of groups obtained temper from a distance of 1 km or less. Clays were obtained at a distance of less than 5 km. Slip and paint materials were usually obtained at a distance of 40 km. or less, and were the materials most likely to be exchanged between groups. The other material classes were usually obtained locally. So, the pottery from the small sites in the vicinity of Salmon does not clearly indicate production within the immediate vicinity. Production within the larger, Middle San Juan area encompassing the San Juan, La Plata, and Animas Valleys can be demonstrated, but a finer determination cannot be made with this information. The tested pottery could have come from Salmon, but some of it probably was not produced there.

Geographic groups II and III are larger than group I, both in terms of numbers of sites and land area examined. Group II consists of five sites and four isolated finds with ceramics, located in the uplands north of the San Juan and east of the Animas (Table 19-11; Map 19-1). These sites will be examined for possible relationships to larger habitation sites in the area discussed by Whalley (1980).

On the basis of features identified during survey and testing or excavation, the Group II sites (Table 19-8) can be described as follows. There were no structures on any of the sites. The rockshelter area (FA 2-16) and the two sites with hearths and/or fire-cracked rock (FA 2-17 and FA 3-6) represent multicomponent campsites. FA 2-16 may also have been a fieldhouse. FA 2-17 had only one sherd, and was probably a preceramic occupation with the sherd representing an isolated use of the area by a later group. The petroglyph panel with one sherd (FA 3-

5), which is known from survey only, and the lithic/ceramic scatter (FA 2-19) do not appear to represent campsites. The lithic/ceramic scatter was tested and no subsurface features were found. A metate found on the surface does indicate vegetal processing.

The pottery types present on the project sites of the Group II area show occupation or use by ceramic-using groups from Early PII through PIII. The isolated finds (Table 19-9) show the same date range (Ceramic Groups 4-9, Table 19-7). Utility wares from the sites are Mancos Gray and Mancos Corrugated. Decorated wares are Mancos Black-on-white, McElmo Black-on-white, and Mesa Verde Black-on-white.

These types and their time ranges correspond with temporal groupings of sites developed by Whalley (1980: 137-141) in her study of Salmon ceramics and ceramic assemblages from a variety of sites in the Middle San Juan. The temporal ranges on her groups are: Pre-A.D. 1050, A.D. 1050-1130, A.D. 1130-1200, and A.D. 1200-1300. The later three groups correspond with the Chacoan florescence, the intermediate period, and the Mesa Verdean occupation of the area. Types found on the project sites in the area encompass all these groups and range in date from A.D. 875-1300.

The pottery from the Farmington Group II area will be compared to Whalley's data. Her examination of pottery from larger sites identified by the SJVAP in the area of the San Juan Valley between Gallegos Canyon and the Animas River provides the information for this study (Whalley 1980). The sites she examined include three Chacoan outliers (identified in terms of size, masonry style, and planned construction); ENM5030, the Jaquez Site, and the Sterling Site (the pottery from this site was not studied, but other information from the site was used in her research); and approximately ten local San Juan sites. The majority of the sites are located in the valley, though ENM5030 is located on a high point above the river, and has an occupation ranging from BMIII pithouses to Mesa Verdean cobble rooms (Whalley 1980). The primary pottery wares present on all of the sites, through all the time periods, are San Juan wares. During the earliest time period of Pre-A.D. 1050, intrusive pottery, mainly Cibola Whitewares and Chuska White and Graywares, are more common at the early Chacoan Outlier sites than at the non-Outlier sites. By the A.D. 1050-1130 time period, intrusives occur in comparable percentages at both outlier and local habitation sites in the San Juan Valley. (This does not seem to be the case in the La Plata Valley, which will be discussed shortly.) In the later time periods, percentages of intrusive ceramics decline strikingly (Whalley 1980: 122-127).

Throughout all time periods, ceramics from the small, upland sites and isolated finds in the project area are all San Juan White- and Graywares. The intrusive types that occur on the larger sites were not found on these small sites. Perhaps trade wares were considered more valuable and were not transported to the smaller sites (Sebastian 1983: 445). Another possibility is that the small upland sites were produced by local La Plata Valley groups instead of San Juan Valley groups. Whalley (1980: 78) reports that the majority of non-Outlier La Plata Valley sites have few intrusive pottery types during the A.D. 1050 to 1130 time period, compared with similar San Juan Valley sites of that time. With the amount of information available from the present study, it is not possible to realistically evaluate this idea. It seems somewhat unlikely, however, since the majority of sherds from the Farmington area sites are tempered with San Juan Valley temper (Warren, this volume), which is a good indicator of local production.

The most numerous ceramic types present on the small Farmington sites are the earlier San Juan types: Mancos Gray, Mancos Corrugated, and Mancos Black-on-white (Table 19-8). Temper sources, as just noted, indicate production in the San Juan Valley for all samples except one piece from FA 2-17 which has La Plata Valley temper. Refiring analysis of five sherds from Group II sites shows yellow-red firing clay from two sherds from the small rock shelter site. These are from a Mancos Corrugated vessel and a Mesa Verde Black-on-white vessel. The other three sherds fired yellow-red-buff and are from Mancos Corrugated, Mancos Black-on-white, and McElmo Black-on-white vessels. The McElmo Black-on-white is from an isolated find. The Mancos Corrugated is from FA 3-6 and the Mancos Black-on-white is from FA 2-19 (Table 19-8, Table 19-15 [Appendix 19-1]). Together, the temper sources and refired clay colors indicate production within the Middle San Juan, with the temper source information indicating the San Juan Valley more strongly.

Period of occupation, ceramic types, and local production of ceramics in the general area all seem to indicate that the Elena Gallegos sites and isolated finds were produced by groups from the larger sites discussed by Whalley (1980: 122-127, 137-141). These small sites could have served either as day-use or short-term camp areas for procurement of upland resources, or for other special purposes, as indicated by the rock art sites. FA 2-16 may also have been a fieldhouse or agricultural area. The large amount of Mancos Black-on-white on the small sites indicates an emphasis on Whalley's Pre-A.D. 1050 group and her 1050-1130 group, though the area shows use throughout the later time periods also.

The Farmington Group II sample of both sites and pottery is small for a functional study based on pottery. This kind of study will be conducted in greater detail on the sites and ceramics from Group III, using the results of previous functional studies in the overall San Juan Basin area (Acklen 1982; Sebastian 1983; Mills 1986). Some interesting functional information can however, be obtained from sites FA 3-6, FA 2-16, and FA 2-19.

Both Sebastian (1983) and Mills (1986) have examined patterns in the occurrence of utility jar sherds, decorated jar sherds, and decorated bowls in an attempt to determine the kinds of forms and finishes that might be expected on different types of sites. Vessel size, as measured by rim diameter, has also been used.

From her research, Sebastian (1983:408) noted two major kinds of ceramic assemblage: the non-local ceramic assemblage (70% utility wares; 30% decorated wares, of which 60% are jars), and the jar dominant assemblage (over 90% jars). She used these assemblage types, in combination with ethnographic and site structural information, to develop the following site categories: habitations, fieldhouses, day-use sites (either fieldhouses or field monitoring situations where overnight residence is not required, or gathering sites), and storage sites. Residential sites such as habitations and fieldhouses tend to have ceramic assemblages indicating residential activities dealing with the storage, preparation, and serving of food (Sebastian calls these "normal" assem-

Table 19-12. Ceramic Assemblages for San Juan Basin Sites.*

Site Type / Assemblage Vars.	Number	Mean Percent	Site Type / Assemblage Vars.	Number	Mean Percent
Roomblocks	222		Hearths	61	
Dec. Jars		18.81	Dec. Jars		18.63
Plain Jars		66.01	Plain Jars		68.04
Dec. Bowls		15.18	Dec. Bowls		13.33
Chaco Structures	16		Baking Pits	4	
Dec. Jars		18.18	Dec. Jars		52.85
Plain Jars		66.26	Plain Jars		37.93
Dec. Bowls		14.86	Dec. Bowls		9.21
Great Kivas	4		Sherd Scatter	36	
Dec. Jars		20.14	Dec. Jars		34.79
Plain Jars		66.06	Plain Jars		51.23
Dec. Bowls		13.80	Dec. Bowls		13.98
Pithouses	40		Sherd/Lithic Scatter	16	
Dec. Jars		5.05	Dec. Jars		24.47
Plain Jars		84.45	Plain Jars		59.99
Dec. Bowls		10.50	Dec. Bowls		15.53
Ledge Rooms	21		Roads/Trails	16	
Dec. Jars		25.34	Dec. Jars		32.80
Plain Jars		62.05	Plain Jars		52.88
Dec. Bowls		12.61	Dec. Bowls		14.31
Fieldhouses	76		Other	20	
Dec. Jars		21.63	Dec. Jars		20.30
Plain Jars		62.78	Plain Jars		57.14
Dec. Bowls		15.59	Dec. Bowls		22.56
Fieldhouse/WCF	7				
Dec. Jars		25.94			
Plain Jars		61.01			
Dec. Bowls		13.05			

*After Mills (1986: Table 34).

blages). Day-use sites and storage sites have jar-dominant assemblages, presumably reflecting water and storage jars.

Mills study (1986) was based on a statistical analysis of form and surface treatment of pottery from 534 ceramic assemblages of 20 or more sherds, and was modeled after a study conducted by Camilli (n.d.). Of greatest interest for the present study is the part of Mills' research in which she calculated the average percentages of utility jars, decorated jars, and bowls for 13 previously-determined site types. These include pithouses, roomblocks, hearths, baking pits, and sherd/lithic scatters as well as others (Mills 1986: Table 34). Mills' results are reproduced here as Table 19-12. These ceramic profiles for the various site types will be used in conjunction with Sebastian's findings to aid in making funtional interpretations of sites in the Farmington area.

As far as Group II sites are concerned, the most informative site with respect to analysis of function based on ceramics is FA 2-16. FA 2-19 and FA 3-6 have small samples and are somewhat hard to interpret. The pottery from FA 2-19, a lithic and sherd scatter with a metate located above the scatter on a sandstone outcrop, consists of sherds that represent a minimum of four whiteware bowls, while the sherds from FA 3-6 represent a minimum of three Mancos Corrugated utility jars. Bowl-dominant assemblages do not correspond to any of Sebastian's or Mills' site type. The survey information describes the site as a pot break, which is a possiblity, but would be more likely with fewer vessels. The testing information indicates that the site is on a well drained slope near a wash with indications of disturbance and artifact movement. Thus, post-occupational natural disturbance may be the best explanation for the collection of bowls.

FA 3-6 is a lithic and fire-cracked rock scatter with hearths and groundstone. The site was excavated and contained no structures. Radiocarbon dates indicate use from Basketmaker through early Pueblo II (Raish, this volume). The site appears to be a reused camp area with evidence of food processing. Since there were only ten sherds on the site, it seems probable that the main occupation(s) was as a non-ceramic campsite. As far as the ceramics are concerned, the site is jar-dominant and might represent day-use during the ceramic occupation. Howver, considering the amount of lithics, bone, and groundstone on the site, a campsite seems the more realistic interpretation even for the ceramic occupation. Two early Pueblo II radiocarbon 14 dates from hearth areas, which accord well with the pottery, strengthen this interpretation.

FA 2-16, the small rockshelter with a hearth, fire-cracked rock, and a petroglyph panel, has a ceramic assemblage consisting of 6.3% decorated jars, 62.5% utility ware jars, and 31.3% decorated bowls. These fall close to the range of Sebastian's "normal" assemblage, indicating a habitation or fieldhouse site (1983: 408), and perhaps also indicating the presence of a structure not discovered during the somewhat limited testing of the site. (The rockshelter is entirely too small to have been used as a habitation.) A fieldhouse would be possible on the site, which is located adjacent to a broad, sandy wash. Testing notes from the site mention a possible garden area, and Zea pollen was noted in the rockshelter, indicating possible storage of corn (Scott Cummings, this volume).

Geographic Group III is located in the uplands north of the San Juan River between the Animas and La Plata Rivers. Farmington Glade arroyo cuts through the area. Sixteen sites and 30 isolated finds containing pottery were recorded in this area (Table 19-11; Map 19-1). The sites consisted of two pitstructures with associated features, five lithic/ceramic scatters, eight lithic/ceramic scatters with features (hearths and/or fire-cracked rock) and one possible agricultural feature (a check dam) (Table 19-8). The two pitstructure sites (FA 1-6 and FA 3-3) were multi-component as were the majority of the other sites. The lithic/ceramic scatters without features (FA 2-10, FA 5-1, FA 5-3, FA 6-1, and FA 6-4), as well as the possible check dam (FA 3-4) identified from survey, had generally scant ceramics. Only FA 5-3 and FA 6-4 (also known only from survey) have more than eight sherds. These scatters do not appear to have been occupation or campsite areas, but special-use areas primarily displaying lithics. Completion of the lithic analysis will undoubedly aid in the interpretation of these sites with respect to both function and period of occupation.

The eight lithic/ceramic scatters with features represent a range of apparent campsite occupations. Four of them have a definite emphasis on lithics, with only one sherd noted on each (FA 1-2, FA 1-5, FA 2-9, FA 2-11). (These may have been preceramic campsites with isolated sherds that are unrelated to the major occupation(s) of the sites.) The remainder have varying numbers of ceramics, from 13 through 168 pieces (FA 1-1, FA 2-6B, FA 2-7, FA 2-8). The sites were all tested, and no structural remains were identified.

Pottery from the area ranges from Basketmaker III through Pueblo III (Ceramic Groups 1-9, Table 19-7), and includes both sites and isolated finds (Tables 19-8 and 19-9). One site, FA 2-8, has a Basketmaker III-Pueblo I assemblage consisting of Rosa Brown and Piedra Brown ceramics. Early Pueblo II-Pueblo II are also represented on the site by Mancos Gray and Mancos Corrugated (Table 19-8). Brownware types have been identified by Eddy (1966) in the Navajo Reservoir District to the east of the areas under discussion. Warren (1986) has recently discussed the occurrence of Navajo Reservoir District types at LA 50337, a site located on the La Plata River approximately 2 mi. (3.2 km.) above its confluence with the San Juan. This site has a long span of occupation and includes both a pitstructure and aboveground rooms. Warren (1986) considers the Brown Wares from this site to be comparable to the Rosa Phase (A.D. 700-850) in the Navajo Reservoir District. The pottery from FA 2-8, dated according to Eddy (1966: 451-452), could range from the late Sambrito Phase (A.D. 600-700) through the late Piedra Phase (A.D. 900-950). Both of these sites represent possible early contact with the Navajo Reservoir District to the east, though the pottery on FA 2-8 was apparently locally made.

The pottery on FA 2-8 represents eight utility ware jars: there were no bowls or painted wares. The site consisted of hearth and stain areas eroding into a wash. No structures were found during testing of the site, but erosion had destroyed a considerable portion of it. The hearths and groundstone on the site indicate a campsite where food was processed and prepared. Several sherds from a Piedra Brown vessel show sooting, which strengthens the view that cooking occurred on the site. Pollen and macrobotanical analyses did not indicate what was being cooked or processed, however (Scott Cummings, this volume and Toll, this volume). Radiocarbon dates indicate a long span of use and reoccupation for this site. They range from A.D. 83 B.C.±298 through A.D. 1350±65 with a cluster of dates in the A.D. 750-850 range (Bertram, this volume)!

With the exception of several yellowware sherds representing contact with the Hopi Mesas, and one Rio Grande Glazeware sherd from the Zia area, the remainder of the pottery from the Group III sites are San Juan and Chuska Wares. One Cibola Grayware sherd, Tohatchi Banded, is also present. San Juan wares compose the great majority of the pottery. There is one vessel of Moccasin Gray, a Pueblo I San Juan utility ware, while the remainder of the San Juan utility wares are Pueblo II-Pueblo III. They consist of Mancos Gray, Mancos Corrugated, Mesa Verde Corrugated, and Hovenweep Corrugated. San Juan Whitewares also fall primarily within the Pueblo II-Pueblo III time span, and consist of Cortez Black-on-white, Mancos Black-on-white, McElmo Black-on-white, and Mesa Verde Black-on-white. Two isolated finds are from earlier time periods: one Chapin Black-on-white (A.D. 575-750) and one Bluff Black-on-red (A.D. 750-900).

Chuskan wares are present in minor percentages on four sites and as one isolated find (Tables 19-8 and 19-9). These consist of Captain Tom Corrugated, Blue Shale Corrugated, Naschitti Black-on-White, and Nava Black-on-White. They represent late Pueblo I/early Pueblo II-Pueblo III.

In general, the pottery shows an occupation of the area from Basketmaker III through Pueblo III, with an emphasis on Pueblo II. This time span and emphasis concur well with previously known sites and with that part of Whalley's research (1980) on the Middle San Juan that deals with the La Plata Valley. The general outline of her work has been described previously. Her research on pottery from sites in the La Plata vicinity included two site groups identified as Chacoan Outliers (Morris 39 and 41) and 54 non-Outlier La Plata Valley sites.

The main pottery types present on Whalley's sites throughout all time periods are San Juan wares. During all time periods intrusive ceramics, primarily Cibola and Chuska wares, are concentrated at the Outlier sites. The non-Outlier sites have many fewer intrusives. Intrusives that are present on local sites are more likely to be Chuskan than Cibolan wares. Somewhat of an exception to this pattern is the fact that some local sites nearer the confluence of the La Plata and the San Juan have higher percentages of intrusives than is the norm for the other local La Plata sites (Whalley 1980: 78). Whalley sees this as a result of interaction with San Juan Valley sites which have more non-local pottery wares (1980: 78). The LA50337 ceramics (Warren 1986), which also have a considerable number of intrusive types, would seem to fall into this category.

Pottery from the small Farmington sites fits in very well with the pattern described for the larger, valley sites. There are few intrusives, and those that are present are Chuska Gray and Whitewares. In the Group III area as in the Group II area, the earlier San Juan wares, such as Mancos Gray, Mancos Corrugated and Mancos Black-on-white, have the strongest representation. This is also the case with the Chuska Wares (Tables 19-5, 19-6 and 19-8). The area shows an emphasis on occupation and use during Pueblo II times as do the La Plata Valley and the San Juan Valley in general.

The temper source study (Warren, this volume) and the refiring study (Appendix 19-1), indicate local production within the Middle San Juan for the San Juan tradition pottery. Possible production within the La Plata Valley exclusively cannot be established on the basis of this sample. In fact, production within the San Juan Valley itself seems more likely. As seen in Table 19-13, yellow-red firing San Juan Valley clays and San Juan Valley temper are in the majority in the Farmington sample. Out of 38 refired sherds with temper source designations, 29 fired yellow-red and 9 fired yellow-red-buff. There were 31 occurrences of San Juan Valley temper to 12 occurrences of La Plata Valley temper. On the basis of this sample, there is no association between refired clay color and temper source. A limited sample also indicates that there is no increase in the incidence of yellow-red-buff firing clays or La Plata Valley temper with increasing proximity to the La Plata (Table 19-14). There does, however, seem to be a relationship between yellow-red firing clays and utility wares, and between yellow-red-buff firing clays and decorated wares. The tendency for red and yellow-red firing clays to be used in utility wares is noted by Wilson (1985). He also notes buff and yellow-red-buff firing clays in the earlier, mineral-painted decorated wares like Cortez and Mancos Black-on-white (Wilson 1985). In the present study, of the 21 utility ware sherds that were refired, 20 fired yellow-red. Of the 12 decorated wares refired from this area, 8 fired yellow-red-buff (1 Cortez B/w, 4 Mancos B/w, 2 McElmo B/w and 1 Mesa Verde B/w) and 4 fired yellow-red (4 Mancos B/w). Thus, the relationship between yellow-red-buff firing clays and early decorated (Cortez and Mancos) wares is not strong in this sample, though most of the decorated wares as a whole did fire yellow-red-buff. Interestingly, none of the decorated wares has La Plata Valley temper. Thus, as seen for the other geographic groups, temper and clay information for Group III indicate local production in the San Juan, Animas, and La Plata vicinity, but a more specific determination cannot be made. The small, upland Pueblo II-Pueblo III sites (excluding the pitstructures which will be discussed separately) are consistent in terms of ceramics with use by groups from larger pueblos in either the La Plata, San Juan, or Animas drainages.

Table 19-13. Refired Sherd and Temper Source Areas.

Temper Source	Refired Sherd Color: Yellow-Red	Refired Sherd Color: Yellow-Red-Buff	Total
San Juan River Valley	22	9	31
La Plata River Valley	7	0	7
Total	29	9	38*

* Of the 41 sherds refired, 38 have temper source designations.

Six sites are amenable to functional study based on ceramic form and finish. These include one lithic/ceramic scatter without features (FA 5-3), three lithic/ceramic scatters with features (FA 1-1, FA 2-6B, FA 2-7), and the two pitstructure sites (FA 1-6, FA 3-3).

FA 5-3 was a lithic/ceramic scatter on a small ridge. It was composed of 42 sherds which make up a minimum of 24 vessels. Fifty percent are decorated jars, 20.8% are plain or utility jars, and 29.1% are decorated bowls. Though these percentages do not match Sebastian's jar-dominant category (1983: 408), the 50% decorated jars, in combination with a lack of features, suggests a reused, day-use gathering site. The site is within 2.5 mi. (4 km.) of the La Plata River, and would be within day-use distance of sites in that area.

The three scatters with hearths (FA 1-1, FA 2-6B, and FA 2-7) are all jar-dominant assemblages. FA 1-1 has sherds from five utility vessels of Mesa Verde corrugated, while FA 2-6B has sherds of one Mancos Corrugated utility vessel. These sites had hearths, but no structures were found during survey or testing. FA 1-1 also had groundstone. These two sites are best described as campsites, with processing and cooking activities. Neither of the sites has a large amount of ceramics, however (13 and 17 sherds respectively), and both have radiocarbon dates that

Table 19-14. Presence of La Plata Valley Temper and Yellow-Red-Buff Refired Sherd Color in Geographic Groupings from the Farmington Area.

Geographic Group	Yellow-Red-Buff Refired Sherd Color: No.	Yellow-Red-Buff Refired Sherd Color: Percent	La Plata Temper: No.	La Plata Temper: Percent
Groups I & II (N=6)	2	33.3	2	33.3
Group III (N=32)	7	21.9	5	15.6
Totals	9		7	

Note: Only the 38 refired sherds with a listed temper source area were used in this table.

indicate preceramic occupations in addition to the later occupations indicated by the pottery. Thus, the campsite and processing activities may relate to the earlier occupations, with the later, ceramic occupations representing day-use activities (Sebastian 1983:408). FA 2-6B is within 3.5 mi. (5.6 km.) of the La Plata River. FA 1-1 is more distant, however.

FA 2-7 has a jar-dominant assemblage consisting of 83.3% decorated jars (five vessels) and 16.7% decorated bowls (one vessel). The site consisted of several artifact clusters and a hearth. The ceramics were not in close association with the hearth. The site is within 3.5 mi. (5.6 km.) of the La Plata River, and could have served as a day-use gathering site. The different ceramic types indicate reuse over a considerable period.

Site FA 1-6 is a multi-component site within 2.5 mi. (4 km.) of the La Plata River. The site was excavated and found to consist of a pitstructure outlined by upright slabs, an attached storage bin, midden areas, hearth areas, and a surface sherd and lithic scatter. Several naturally-occurring clay deposits were found on the site, and may have been used by the inhabitants. Considerable processing would be required before the clay could be used for pottery, however. The site is described in detail in the excavation section of this report.

Both ceramic types and radiocarbon dates indicate a multi-component site. A minimum of 122 vessels made up of 300 sherds were found on the site. Identifiable types include Mancos Black-on-white, McElmo Black-on-white, Mancos Corrugated, Mesa Verde Corrugated, and Blue Shale Corrugated (Table 19-8). These types range from A.D. 900-1300,with a major emphasis on the A.D. 900-1150 period (Warren this volume). One Kotyiti Glaze-Red sherd was also found on the site in uncertain provenience. The overall assemblage consists of 17.2% decorated jars, 61.5% plain or utility jars, and 21.3% bowls. Thus, the percentage of utility wares is 61.5%, and of decorated wares is 38.5%. These percentages are similar, but not identical, to Sebastian's normal or habitation ceramic assemblage.

No ceramics were found in floor context within the pitstructure or within the small storage area. Pottery is found within the structure fill. Carbon 14 dates from the structure indicate occupation in the early seventh century A.D. (Raish, this volume), which predates the earliest dates of the pottery types on the site. First use of the structure was apparently as a Basketmaker III upland occupation. The nature and extent of the ceramics show considerable reuse of the site area during Pueblo II and into Pueblo III times. The Blue Shale Corrugated sherds indicate contact with the Chuska region during Pueblo II times. The glazeware was found in a modern trash dump where prehistoric artifacts had also been dumped. It may not be related to use of the site.

Site FA 3-3 is also a multi-component, excavated site consisting of a pitstructure, a possible living floor, a midden area, four hearths, and three roasting pits. The site is located in a protected area against a sandstone outcrop, and has been reused over time as a habitation-campsite-processing locale. It is described in detail in the excavation reports section of this volume (Raish, this volume).

Both ceramic types and radiocarbon dates indicate multi-componency. A minimum of 87 vessels composed of 222 sherds were identified from the site. The ceramic types of these vessels are: Cortez Black-on-white, McElmo Black-on-white, Naschitti Black-on-white, Nava Black-on-white, Mancos Gray, Mancos Corrugated, Captain Tom Corrugated, and Blue Shale Corrugated. One Tohatchi Banded vessel also occurred (Table 19-8). These types range in date from A.D. 875-1300, Late Pueblo I/Early Pueblo II-Pueblo III. The major occupation was definitely during Pueblo II, however. Intrusive wares indicate minor contact with the Cibola Tradition area to the south and continuing, though minor, contact with the Chuska region (represented by eight sherds). The pottery found on each of the discreet feature areas is discussed in the excavation report (Raish, this volume). The pitstructure itself has radiocarbon dates of about 1000 A.D., which accord well with a Cortez Black-on-white vessel found in floor context and with interpretation of the structure as an Early Pueblo II habitation. Use of the site continued throughout Pueblo II and into Pueblo III times.

In summary, pottery from all three of the geographic groupings indicates local production within the Middle San Juan area. The vast majority of pottery types are from the San Juan ceramic tradition, with clay and temper source studies indicating local production of these wares. In the main, the few intrusives that are present are from the Chuska region. The pottery types indicate occupation of the area from Basketmaker III through Pueblo III times, with a greater intensity of occupation in Pueblo II and early Pueblo III times. This coincides with the occupation of the larger pueblos in the vicinity.

The types of sites present in the Farmington study area, in combination with the ceramic types and ceramic production locations, indicate use of the area by groups from nearby larger pueblos. Thus, these small, nonstructual sites are considered to be related to the larger ones in the area. Combined temper and clay source studies were not able to narrow the production zones down below the level of the general Middle San Juan, however. The refiring sample from this study was quite small and undoubtedly not all the clay sources in the area have been examined. This is a research avenue that definitely merits further exploration.

As far as the larger questions of (a) adaptive diversity, and (b) simultaneous use of a hinterland by forager groups and/or by groups coming out from pueblos in the area are concerned, the Farmington ceramic data can provide some valuable information. The majority of ceramics from the small Farmington sites do not represent use by intrusive, ceramic-using groups. They are local types that were locally produced, and coincide with types in use at the pueblos of the vicinity. Thus, they most likely represent use of the area by groups coming out from local pueblos.

Unfortunately, this study does not solve the problem of whether intrusive or foreign ceramics in an area indicate the presence of intrusive groups or the presence of local groups using trade wares. This remains a problem for any study attempting to determine the presence of intrusive groups in an area on the basis of ceramics. It can be said that the Farmington sites indicate local usage simply because the overwhelming majority of ceramics on the sites are locally produced San Juan wares. Thus, the "origin of intrusives" problem is minimized.

The other, more common aspect of the adaptive diversity question concerns the identification of groups alternating between a sedentary Puebloan adaptation and a more nomadic forager adaptation in the same general area. Whalley (1980) discusses this in terms of the Intermediate Occupation at Salmon Ruin from ca. A.D. 1150-1200. This time period was initially considered to be a period of abandonment between the Primary "Chacoan" Occupation and the Secondary "Mesa Verdean" Occupation. More recently, the Intermediate has been considered not to represent abandonment but simply a reduced occupation. Nonetheless, as Whalley suggests, an increase in hinterland occupation during the Intermediate might indicate that a strategy of adaptive diversity was in operation. Unfortunately, as she also discusses, no ceramic type is finely enough dated to serve as an indicator of this specific time period. Though McElmo Black-on-white is associated with the Intermediate at Salmon, it occurs in the other occupations as well and has a date range that is considerably broader than the Intermediate period. Even without a fine-tuned date on McElmo Black-on-white, however, the project area sites indicate that the heaviest use of these upland zones was during the earlier Mancos Black-on-white times, which are the time periods prior to and during the major occupations of the larger pueblos. Thus, the pottery from the small sites under study, at least, does not indicate the operation of a strategy of adaptive diversity during the Intermediate period. The pottery and the sites seem, instead, to represent use of upland zones by groups resident locally at larger pueblos.

Appendix 19-1 • Ceramic Refiring Analysis

This study follows in the tradition of previous refiring studies conducted with ceramics from the area (Shepard 1939; Windes 1977; Franklin 1979a, 1979b, 1980; Sudar-Laumbach 1980; Perry 1980; Warren n.d.; Wilson 1985) It follows most closely the work of Franklin (1979a, 1979b, 1980) and Wilson (1985) on the ceramics from Salmon Ruin. Wilson's work is followed most closely since he places particular emphasis on San Juan tradition ceramics, as does the present study.

Wilson's study attempts to determine which San Juan ceramics and ceramic types may have been produced locally in the Salmon area, and which may have been brought in from other areas producing San Juan-tradition ceramics. Matching the refired paste color of sherds from Salmon to fired samples taken from clay sources in the vicinity is one of the means Wilson uses to examine local versus nonlocally produced San Juan Wares at Salmon Ruin. Refiring of sherds and samples is necessary so they can be compared after exposure to the same firing conditions. As discussed by Shepard, clay containing less than 1.5 percent iron oxides will generally oxidize to a white or cream color, from 1.5 percent to 3 percent to a buff color, and more than 3 percent to a red color (Shepard 1965:150).

The present study compares refired paste colors of sherds from the project areas to the colors obtained by Wilson (1985:34-44) and to paste colors obtained in other studies in the general area (Shepard 1939; Franklin 1979a, 1979b, 1980; Warren n.d.). This information is used to explore possible relationships that the pottery and the sites in the project areas may have to other areas in the San Juan ceramic producing region.

As Wilson discusses (1985: 37-38), however, there are limitations to the information produced by refiring analysis. Certain cautions must be adhered to. The basic assumption of refiring analysis is that clay samples from the same source area will contain the same amounts of mineral impurities and will fire to similar colors (Wilson 1985: 37-38). Samples that fire to the same color do not necessarily have to come from the same source area, however. A clay deposit may occur over a wide area or clay from separate deposits may fire to the same color. Wilson suggests, though, that clays firing to very different colors may usually be assumed to have come from different sources. In addition, if little color variation is noted in refired ceramics, it may be possible that they were made with clay from the same source. If clay from a local source fires to the same color as pottery from a particular site, this clay may represent the source used in manufacture (Wilson 1985: 37-38).

With this in mind, the present study was designed to examine refired clay color of ceramics from the Farmington areas under conditions as comparable as possible to Wilson's, so that his findings can be used. Firing conditions, color identification, and color categories are duplicated as closely as possible (Wilson 1985:38-41).

Forty-one San Juan-tradition sherds (4.06 percent of the total sherds and 7.64 percent of the San Juan-tradition sherds) were selected for refiring. Every attempt was made to obtain a representative spread of types and sites. Due to numbers, however, the excavated sites were emphasized. Since one of the major interests of this study is determining refired paste color for the various San Juan ceramic types, only sherds identifiable as to type were used. Since many of the pieces were very small, whole sherds were used as opposed to clips. These were renumbered with a clay pencil to survive firing, and then were mixed before refiring so that neither their ceramic type nor site would be known during color coding.

All the sherds were refired in one load by Mr. David Allen of the Ceramic Center in Albuquerque in an electric Duncan Ceramic Kiln model DK 820-1. They were fired to approximately 900 degree centigrade, or cone 012, reaching this temperature in about 3 1/2 hours. They were then allowed to cool slowly to room temperature.

Colors were coded using the 1973 edition of the Munsell Soil Color Charts. Wilson used the more complete Munsell Book of Color (1971)(1985:39), but for this study, the smaller 1973 edition is perfectly adequate. After refiring, the core color was recorded from a fresh break under indirect sunlight and a 60 watt study lamp. Hue, value, and chroma were recorded. This information was then recorded in Wilson's color categories so the results of this study could be compared to his (1985:40). His larger color categories are composed of hue and value combinations. They do not include chroma, which he found to be uninformative for his purposes. His larger color categories are "Red" (10R hue; 5-8 value); "Yellow-Red" (2.5 YR, 5 YR, 7.5 YR hues; 5-8 value); "Yellow-Red-Buff" (10 YR hue; 8-9 value); and "Buff" (2.5 Y, 5 Y hues; 9 value). All of the pieces from the Farmington study areas fall within the "Yellow-Red" and "Yellow-Red-Buff" categories.

Table 19-15 lists all the refired pieces along with their Munsell color classification and their grouping according to Wilson's categories. Table 19-16 gives the larger color categories of the eight ceramic types tested.

Though the refired sample from the project areas is small, certain valuable comparisons can be made to Wilson's data (1985:85-95). Wilson uses several different attributes, including clay color, paint type, and tempering material, in his discussions of local versus

Table 19-15. Refired Sherds: San Juan White and Gray Wares.

Refiring Number	Site/Specimen Number	Ceramic Type	Post-Firing Munsell Color Notation	Post-Firing Color Category (Wilson)
1	FA 1-2-23-1	Mancos Corrugated	5YR 6/3	Yellow-Red
2	FA 6-IF64-10	Mancos Black-on-White	10YR 8/2	Yellow-Red-Buff
3	FA 3-4-3	Mancos Black-on-White	10YR 8/2	Yellow-Red-Buff
4	FA 3-3-406-1	Mancos Gray	7.5YR 8/4	Yellow-Red
5	FA 4-1-2	Mesa Verde Black-on-White	7.5YR 7/6	Yellow-Red
6	FA 3-3-383-1	Mancos Gray	7.5YR 8/4	Yellow-Red
7	FA 3-3-445-1	Mancos Corrugated	7.5YR 7/2	Yellow-Red
8	FA 3-6-575-1	Mancos Corrugated	10YR 8/3	Yellow-Red-Buff
9	FA 2-19-3	Mancos Black-on-White	10YR 8/2	Yellow-Red-Buff
10	FA 3-3-42-1	Mancos Gray	7.5YR 8/4	Yellow-Red
11	FA 1-6-35-1	McElmo Black-on-White	10YR 8/2	Yellow-Red-Buff
12	FA 3-3-266-1	Mancos Corrugated	7.5YR 8/2	Yellow-Red
13	FA 3-3-193-1	Mancos Corrugated	5YR 7/6	Yellow-Red
14	FA 3-3-596-1	Cortez Black-on-White	10YR 8/2	Yellow-Red-Buff
15	FA 1-6-196-2	Mancos Corrugated	5YR 8/2	Yellow-Red
16	FA 3-3-7-1	Mancos Corrugated	5YR 7/6	Yellow-Red
17	FA 2-IF9-1	McElmo Black-on-White	10YR 8/3	Yellow-Red-Buff
18	FA 1-6-6-8	Mancos Black-on-White	7.5YR 8/2	Yellow-Red
19	FA 1-6-273-4	Mesa Verde Corrugated	5YR 6/6	Yellow-Red
20	FA 4-2-5	McElmo Black-on-White	7.5YR 8/2	Yellow-Red
21	FA 2-16-44-6	Mancos Corrugated	2.5YR 6/8	Yellow-Red
22	FA 3-3-28-2	Mancos Gray	7.5YR 7/4	Yellow-Red
23	FA 4-2-4	Mesa Verde Black-on-White	10YR 8/3	Yellow-Red-Buff
24	FA 5-3-57-8	Moccasin Gray	7.5YR 8/2	Yellow-Red
25	FA 6-IF13-3	Mancos Black-on-White	10YR 8/4	Yellow-Red-Buff
26	FA 2-8-82-1	Mancos Gray	10YR 7/2	Yellow-Red-Buff
27	FA 1-6-309-7	Mancos Corrugated	5YR 8/4	Yellow-Red
28	FA 6-IF20-2	McElmo Black-on-White	10YR 8/2	Yellow-Red-Buff
29	FA 5-3-44-2	Mancos Black-on-White	7.5YR 7/2	Yellow-Red
30	FA 2-16-68-3	Mesa Verde Black-on-White	7.5YR 8/6	Yellow-Red
31	FA 1-1-38-2	Mesa Verde Corrugated	7.5YR 8/4	Yellow-Red
32	FA 1-6-142-46	Mancos Black-on-White	10YR 8/3	Yellow-Red-Buff
33	FA 2-6B-17-1	Mancos Corrugated	5YR 7/6	Yellow-Red
34	FA 1-6-137-1	Mesa Verde Corrugated	7.5YR 7/6	Yellow-Red
35	FA 1-6-219-1	Mancos Corrugated	2.5YR 6/8	Yellow-Red
36	FA 6-4-25	Mancos Black-on-White	7.5YR 8/2	Yellow-Red
37	FA 1-6-13-1	Mesa Verde Corrugated	7.5YR 8/4	Yellow-Red
38	FA 1-6-290-4	Mancos Black-on-White	7.5YR 8/4	Yellow-Red
39	FA 1-6-196-61	Mesa Verde Corrugated	5 YR 6/6	Yellow-Red
40	FA 2-7-98-2	Mesa Verde Black-on-White	10YR 8/3	Yellow-Red
41	FA 1-6-12-2	Mesa Verde Corrugated	5YR 7/6	Yellow-Red

nonlocal ceramics. Only refired clay colors are discussed here. The other attributes he uses are considered in other sections of this report. To briefly sum up his information on clay color, he found that pottery produced locally in the Salmon vicinity emphasizes red and yellow-red firing clays. To a much smaller extent, yellow-red-buff firing clays are also used, though they are more common in other areas of the San Juan region. Aztec Ruin, located along the Animas River 15 miles north of Salmon, is also an area where yellow-red firing clays predominate. Buff firing clays are not used locally at Salmon but are used in other San Juan areas (Wilson 1985:85-95). Other research reports that clay and ceramic samples from along the La Plata River mostly fire to buff colors (Shepard 1939; Franklin 1979a, 1979b). Potters along the La Plata drainage apparently exploited yellow-red-buff or buff firing clays available in the area (Wilson 1985:91). According to Wilson, there is a trend through time at Salmon towards more locally made ceramics using the local red and yellow-red firing clays. Earlier occupations show more non-local buff and yellow-red-buff firing ceramics (Wilson 1985:iv).

Wilson examines both gray and white San Juan wares from Salmon to determine their general areas of production. This information can be compared to that obtained from the refiring study of the pottery from the Farmington project areas, which lie between the areas of Salmon, Aztec, and the sites along the La Plata. The refiring studies on San Juan utility wares from Salmon (Franklin 1979b; Wilson 1985:109) indicate that the great majority from all time periods fire red or yellow-red, and were probably locally made. A higher proportion of corrugated sherds from the earlier occupation fire to a lighter yellow red (those 7.5 YR in hue) or yellow-red-buff, while those in the later occupation fire to very red colors. The tendency to fire in the red range increases through time, though red and yellow-red colors are always in the majority. The refired gray wares from Farmington match these conclusions. Of the 23 utility ware sherds tested, 21 fired yellow-red while two fired yellow-red-buff (one Mancos Gray and one Mancos Corrugated) (Table 19-16). These color ranges indicate possible production in the Salmon/Aztec vicinity.

Wilson examines the decorated wares by type, focusing on Cortez, Mancos, McElmo, and Mesa Verde Black-on-whites. According to Wilson's Table 30 (1985:107), the majority of the Cortez Black-on-white pieces that he refired are yellow-red-buff in color (as is the piece from the Farmington project area) (Table 19-16). His information on Mancos Black-on white indicates that a high proportion of these sherds (77%) fire to a buff or yellow-red-buff color, while the remainder fire red or yellow-red (Wilson 1985:105-107). Refired examples of Mancos Black-on-white from the Farmington areas show a more even split, with five firing yellow-red-buff and four yellow-red (Table 19-16). McElmo Black-on-white in the Salmon sample shows a relatively even split, though the incidence of red and yellow-red firing samples increases from Mancos Black-on-white. Of the McElmo pieces, 45% fire red or yellow-red while 55% fire yellow-red-buff or buff (Wilson 1985:105-107). In the project areas, three McElmo pieces fired yellow-red-buff while one fired yellow-red (Table 19-16). The Salmon samples of Cortez, Mancos, and McElmo do not show any changes in color through time (Wilson 1985:109-114). The Salmon Mesa Verde Black-on-white sample refires to red and yellow-red in 63% of the cases and to yellow-red-buff or buff in 36% of the cases, with the greater incidence of buff and yellow-red-buff earlier in the Mesa Verde Black-on-white time period (Wilson 1985:107,114). The refired sample of Mesa Verde Black-on-white from the study areas shows an even split, two sherds fire yellow-red and two fire yellow-red-buff (Table 19-16).

To sum up, utility wares from Salmon Ruin generally fire to a red or yellow-red color, which leads Wilson to conclude that they were locally made (1985: 94-96). His

Table 19-16. Refired Paste Color of San Juan Ceramic Types.

Ceramic Type	Yellow-Red No.	Yellow-Red Percent	Yellow-Red-Buff No.	Yellow-Red-Buff Percent	Total of Type No.	Total of Type Percent
Cortez B/w			1	100	1	100
Mancos B/w	4	44	5	56	9	100
McElmo B/w	1	25	3	75	4	100
Mesa Verde B/w	2	50	2	50	4	100
Moccasin Gray	1	100			1	100
Mancos Gray	4	80	1	20	5	100
Mancos Corrugated	10	91	1	9	11	100
Mesa Verde Corrugated			6	100	6	100
Total Sherds in Color Categories	28	68	13	32	41	100

study of clay sources indicates that alluvial clays scattered along the San Juan drainage, north of Bloomfield, along the La Plata near Farmington, and along the Animas near Farmington and Aztec all fire yellow-red, except one from the San Juan drainage which fires red. Yellow-red firing clays, then, are the predominant clay of the general area (Wilson 1985:94-96).

The Farmington utility ware sample is very similar in refired paste color to the utility wares from Salmon, and was probably produced in the vicinity of Salmon or perhaps Aztec (one of the areas in the vicinity where yellow-red firing clay is present), if not at the pueblos themselves. Several of the ceramic types under discussion have date ranges earlier than the occupation of Salmon, but could have been produced at other sites in the general area. In any case, similarity of clay color only indicates the possibility or likelihood that pottery was produced in the area, not that it was definitely produced at any particular site. The correspondence between the Salmon sample of refired white wares and those from the study areas is not as close as that for the utility wares. On a type-by-type basis, the Farmington sample is very small, which has undoubtedly caused distortion of the data. Overall, however, certain interesting information is apparent from the sample. The yellow-red firing clay found in the Mancos Black-on-white sherds from Farmington indicates that at least some of this earlier type may have been locally produced. The majority from Salmon come from buff or yellow-red-buff clay producing areas, which indicates they were probably not produced in the Salmon vicinity. The closest of these areas is along the La Plata River (Shepard 1939; Franklin 1979a, 1979b) while others also occur in the northern portion of the San Juan Region such as Mesa Verde National Park and the Dolores River drainage (Windes 1977; Wilson 1985). These latter areas also produce clays firing to red and yellow-red, but it appears that the lighter clays were being used during the occupation of Salmon.

The later San Juan white wares (McElmo Black-on-white and Mesa Verde Black-on-white) from the Salmon sample have both buff and yellow-red-buff, and red and yellow-red firing clays. The emphasis is on the red colors, however, and this emphasis increases through time. This is interpreted as indicating an increase in white wares locally made in the Salmon area (Wilson 1985:107-114). The Farmington white ware samples have both yellow-red and yellow-red-buff paste colors, with yellow-red-buff actually predominating (Table 19-16). This most probably indicates contact with the Salmon and Aztec areas as well as with sites along the La Plata River. This is not surprising since the study areas are located along the San Juan River roughly between the La Plata and the Animas.

Appendix 19-2 • Ceramic Coding Guide

Pottery Type Code		Date Range	Synonyms
001	Plain undifferentiated		
002	Too small to identify or too spalled to identify, etc.		
005	Lino Gray	500-875?	
006	Lino Gray fugitive red	as above	
008	Puki Lining		
010	Plain, unpolished outside; polished interior		
011	Carnuel (Carnue) Plain	1690-1900	
012	Carnuel Plain, "brickware"	as above	
013	Corona Plain	1450-1700 (1450-1670 Warren, 1982)	
020	Plain, polished (undifferentiated)		
021	Plain, polished whiteware, undifferentiated		
022	Plain, polished whiteware, slipped		
024	Lino Polished	500-875?	Obelisk Gray, Chapin Gray
025	Lino Polished, fugitive red	500-875?	
026	Woodruff Brown	500-875?	
027	Forestdale Red		
028	Alma Plain	±300-1300?	
029	Jornado Brown	±900-1350	Alma Plain
030	El Paso Brown	500-1100	
031	Brown Plain, Polished		
032	Brown Plain, Smoothed		
033	Piedra Gray	700-950 (Eddy, 1966)	
034	Piedra Brown	700-950 (Eddy, 1966)	
035	Rosa Gray	600-900 (Eddy, 1966)	
036	Gray Plain, Smoothed		
037	Mummy Lake Gray	950-1200 (Swannack, 1969)	
038	Rosa Brown	600-750 (Eddy, 1966)	
039	Los Pinos Brown	300-750 (Eddy, 1966)	
040	Plainware, ploished, smudged, undifferentiated		
041	Woodruff Smudged (interior bowls)	300-700	
042	Woodruff Smudged (both sides)	300-700	
043	Lino Smudged (smudged in or out)	500-650	
044	Showlow Smudged	?1100-1300?	
049	Kapo Black	1700-1900+ (?1650? Warren 1979a)	
050	Manzano Black		
058	Alma Plain, Punched	300-1300?	
059	Lino Gray, Punched; Tooled	500-875?	
060	Plain, Unpolished, Tooled		
061	Plain, Unpolished, incised		
062	Taos Incised		
063	Potsui'i Incised		
064	Playas Incised		
065	Plain unpolished, punctate		
070	Plain, unpolished, scored		

Pottery Type Code		Date Range	Synonyms
071	Lino "Scored"	?500-875?	
072	Alma Scored	300-900+	
075	Dinetah Scored		
076	Dinetah Scored, Micaceous		
078	Redware, Unpolished, Unslipped		
079	Redware, Polished, Unslipped		
080	Redware, Polished, Slipped		
081	San Francisco Red	500-950	Lino Red; Talahogar Red
082	Woodruff Red		
083	Lino Red	?500-650	
085	Jeddito Plain	?1300-1625?	
088	Salinas Red	1650-1700+ (Warren, 1982)	
089	Posuge Red		
090	Plain, Unpolished, micaceous		
091	Plain, buff, tan, brown, polished		
092	Plain, buff, tan, brown, polished, bisqueware		
095	Plain, Polished, micaceous		
096	Plain, Unpolished, mica slipped		
097	Adamana Brown	300-?	
098	Ocate Micaceous	?1650-1900?	
099	Cimarron Micaceous	?1650-1900?	
100	Alma Neckbanded (Eastern Variant)		
101	Neckbanded, undifferentiated		
102	Neckbanded (2-5mm), undifferentiated	825-1200+	
103	Neckbanded (5 mm+)	760-1300	
104	Neckbanded (5mm+), Tooled		
105	Filleted, Undifferentiated		
106	Alma Washboard Jar Sherd		
108	Navajo Filleted		
109	Navajo Filleted Polished Inside		
110	Mancos Gray Neckbanded	875-950 (Abel, 1955)	
111	Pilares Banded		
115	Washboard Corrugated		
116	Gallina Corrugated		
119	Corrugated, clapboard, flattened, indented		
120	Corrugated, undifferentiated		
121	Corrugated, Clapboard, 2-5 mm	850-1075	
122	Corrugated Clapboard, 5 mm+	850-1075	
123	Corrugated Clapboard Flattened, ca. 8-10 mm	850-1075	
124	Corrugated, Clapboard Finger-Patterned	850-1075	
125	Los Lunas Smudged	?1175-1400?	
126	Pitoche Banded	1050-1150+	
127	Pilares Fine Banded and Indented	?1150-1275?	
128	Corrugated, Clapboard, Indented, Everted	850-1075	
129	Piedra Gray Neckbanded		

Pottery Type Code		Date Range	Synonyms
130	Corrugated, ribbed		
131	Corrugated, ribbed, patterned		
132	Corrugated, ribbed, punctated		
135	Corrugated, Basket-Impressed		
140	Corrugated, Indented, undifferentiated		
141	Corrugated, Indented (2-5mm), Tusayan Style	950-1300 (Breternitz, 1966)	
142	Corrugated, Indented (5 mm+)		
143	Corrugated, Indented, Tooled		
144	Corrugated, Indented, Ribbed		
145	Corrugated, Indented, Large Scallops (Tseh So Style)	890-1075	
146	Oshoa Indented		
148	Corrugated, Flattened (less than 8-10 mm)		
149	Corrugated, Indented, Flattened		
150	Corrugated, Indented, Flattened (Moenkopi Style)		
154	Corrugated, Indented, Oblique, Neckbanded (Plain Base)		
155	Corrugated, Indented, Oblique	900-1300	
156	Corrugated, Indented, Vertical		
157	Corrugated, Indented, Oblique (left)	900-1300	
158	Corrugated, Indented, Oblique (right)	900-1300	
159	Dinetah Corrugated, Indented		
160	Corrugated, Patterned, Undifferentiated		
161	Corrugated, Tooled, Undifferentiated		
162	Corrugated, Incised, Undifferentiated		
163	Moccasin Gray	775-900 (Warren, n.d.)	
167	Corrugated, Indented, Smeared	1050-1300	
169	Corrugated, Indented, Oblique, Smeared	1050-1150	
170	corrugated, indented, Mancos	900-1200 (Abel, 1955)	
171	corrugated, Indented, Smeared, Micaceous		
172	Prieta Smeared Indented		
174	Corona Corrugated	1225-1460 (Warren, 1982)	
175	corrugated, Blind-Indented	1350-1600	
176	Corrugated, Blind-Indented, Micaceous		
177	Corrugated, Blind-Indented, Polished Interior		
178	Tohatchi Banded	900-1050 (Breternitz, 1966)	
179	blue Shale Corrugated	925-1150 (Windes, 1977)	
180	Captain Tom COrrugated	875/900-1000 (Windes, 1977)	
181	Mesa Verde Corrugated	1100-1300 (Windes, 1977)	
182	Coolidge Corrugated		
183	Chaco Corrugated		
184	Newcomb Corrugated	875-950 (Windes, 1977)	
185	Rio Grande Grayware		
186	Rio Grande Grayware, Micaceous		
190	Hovenweep Corrugated	1250-1300 (Abel, 1955)	
191	Mancos/Corrugated/Hovenweep Gray Style		

Pottery Type Code		Date Range	Synonyms
200	Undifferentiated Mineral/Gray		
201	Undifferentiated M/W		
202	Undifferentiated Unslipped		
203	Undifferentiated Slipped		
204	Undifferentiated Whiteware		
205	San Marcial B/W	500-875	Kiatuthlanna B/W; La Plata B/W
206	Kiatuthlanna B/W	?750-1050?	
210	La Plata B/W	500-850	
211	White Mound B/W	675-900	
212	Escavada B/W	925-1125	
214	Cortez B/W	900-1075	Kiatuthlanna B/W; Cortez B/W
215	Red Mesa B/W	?850-1025	
216	Socorro B/W	1050-1275 (1050-1300 Warren, 1982)	
217	Cebolleta B/W	900-1150 (also 1150-1300 Warren, 1982)	
218	"Judd Solid" B/W (see "Chaco Canyon")		Mancos B/W; Escavada B/W
219	Kwahe'e B/W	1050-1150 (Lang, 1982)	
220	Late Gallup B/W	?900-1125 (1050-1125 Warren, 1982)	Mancos B/W in part
221	Puerco B/W	1000-1125	
222	Reserve B/W	940-1125	
223	Chaco B/W	1050-1125	Mancos B/W in part
224	Mancos B/W	950-1150+	
225	Mangus B/W	?775-1050?	
226	Mimbres B/W	?1050-1250?	
227	Tularosa B/W	1125-1250	
228	Snowflake B/W	1100-1250	
229	Casa Colorado B/W	1050-1400?	
230	Chupadero B/W	1175-1550	
231	Taos B/W	1150-1250	
232	Piedra B/W	750-900 (Breternitz, 1966)	
233	Early Gallup B/W	800-1050? (Warren, 1979b)	
234	Taylor B/W	1000-1100 (Windes, 1977)	
236	Chapin B/W	900-1000 (Windes, 1977)	
237	Naschitti B/W	900-1000 (Windes, 1977)	
301	Undifferentiated C/W		
302	Undifferentiated C/W Unslipped		
303	Undifferentiated C/W Slipped		
305	Rosa B/W		
306	Kana'a B/W		
310	Lino Black/Gray	575-875?	
311	Lino R/W	?500-650?	
315	Black Mesa B/W	875-1130	
316	Burnham B/W (framed squiggles)		

Pottery Type Code		Date Range	Synonyms
320	Dogozshi B/W	1075-1200	
321	Sosi B/W	1075-1200	
322	Flagstaff B?W	1075-1275	
323	Tusayan B/W		
325	Wetherill B/W	1050-1125	
326	McElmo B/W	1050-1300+	
327	Mesa Verde B/W	?1150-1300+	
328	McElmo/Mesa Verde	1050-1300	
329	Gallina B/W	+/- 1250	
330	Santa Fe B/W	1175-1300 (1225-1350 Warren, 1982)	
335	Galisteo B/W	?1250-1350	
340	Wiyo B/W	1300-1400	
341	Abiquiu B/W	1350-1450 (1350-1480 Lang, 1982)	
342	Bandelier B/W	1425-1550	
343	Sankawi B/Cream	?1500-1625? (1550-1625 Lang, 1982)	
344	Biscuitware, Undifferentiated	1350-1550	
345	Rowe B/W		
346	Poge B/W		
349	Vallecitos B/W	?1250-1350	
350	Jemez B/W	?1300-1700	
351	Nava B/W	1100-1300 (Windes, 1977)	
352	Chuska B/W	1000-1125 (Windes, 1977)	
401	Undetermined B/R		
402	Undetermined Unslipped		
403	Undetermined Slipped Red		
404	Undetermined R/Brown	500-1300?	
405	Abajo R/O	700-900	
406	Bluff B/R	800-900 (750-900 Warren, n.d.)	
407	Deadman's B/R	775-1075	
408	La Plata B/R	800-1000	
410	Mogollon R/B	?775-950?	
415	Three Rivers Red/Terracotta		
420	Puerco B/R	1030-1175	
421	Wingate B/R	1050-1200	
422	St. John's B/R	1175-1300	
430	Tuayan B/R	1050-1150	
432	Cedar Creek Polychrome	1300-1375	
433	Kwakina Polychrome	1300-1375	
434	Pinnawa B/W	1350-1450	
435	Heshatauthla Polychrome	?1250-1325? (1275-1300+ Snow, 1982)	

Pottery Type Code		Date Range	Synonyms
436	Heshatauthla B/R	?1250-1325?	
		(1275-1300+ Snow, 1982)	
440	Jeddito B/Y	1300-1400+	
441	Sityatki Polychrome	1375-1625?	
442	San Bernardo Polychrome (?)	?1625-?1700	
445	Jeddito Red on Yellow (?)	1350-? (Warren, n.d.)	
446	Jeddito Plain	?1300-1625	
451	Redware and White matte, Undifferentiated		
452	St. John's Ploychrome	1175-1300	
453	Wingate Polychrome		
460	Lincoln B/R	1300-1400	
501	Undetermined, Glaze	NOTE: Numbers 501-537 are Body Sherd Codes	
502	Red, Body Sherd, Glaze		
503	Red and White, Glaze		
504	Cream, Yellow, Red Exterior (San Clemente)		
505	White, Body Sherd		
506	Yellow Body Sherd		
507	Pink Body Sherd		
509	Glaze Polychrome Undifferentiated		
510	Glaze/Red Body Sherd		
511	Glaze/Red and White Body Sherd		
512	Glaze Polychrome, Red, Yellow Surfaces		
513	Glaze Polychrome, Red, and Pink Surfaces		
514	Glaze Polychrome, White and Pink Surfaces		
515	Glaze/White Body Sherd		
517	Glaze/Pink Body Sherd		
518	Glaze/Yellow Body Sherd		
520	Glaze/Red + Red Matte		
521	Glaze/Red and White + Red Matte		
522	Glaze/White + Red Matte		
526	Glaze/Yellow + Red Matte		
527	Glaze/Pink + Red Matte		
528	Glaze/Orange + Red Matte		
529	Glaze/Tan + Red Matte		
530	See 452		
531	See 453		
532	Glaze/Cream and White		
533	Glaze/Cream and Red		
534	Glaze/Red and Orange		
535	Glaze/Red and Tan		
536	Glaze/Cream, Red, and Orange		
537	Tan Body Sherd		
538	Redware (Glaze)-Rim (No Glaze Paint Present, Not Glaze A)		
539	Agua Fria B/W		

Pottery Type Code		Date Range	Synonyms
540	Glazeware, Late F	1700+	
550	Glaze A Rim	1315-1425	
551	Agua Fria Glaze/Red	1315-1400 (1315-1425 Warren, 1980)	
552	Las Padillas Glaze Polychrome	?1300-1350	
553	Arenal Glaze Polyshrome	1315?	
554	Agua Fria Glaze Polychrome		
555	San Clemente Glaze Polychrome	1315-1400 (1325-1425 Warren, 1980)	
556	Pottery Mound Glaze Polychrome	1400-1490	
558	Cienequilla Glaze Pink		
559	Cieneguilla Glaze White		
560	Cieneguilla Glaze Yellow	1350-1400 (1325-1425 Warren, 1980)	
561	Cieneguilla Glaze Polychrome	1350-1400 (1325-1425 Warren, 1980	
562	Kuaua Glaze Red	1350-1500	
563	Kuaua Glaze Yellow	1350-1500	
565	Largo Glaze Yellow	1400-1450	
566	Largo Polychrome	1400-1450	
567	Kuaua Glaze Polychrome		
569	Intermediate Glaze Polychrome	1425-1500 (Warren, 1979c)	
570	Espinoso Glaze Polychrome	1425-1490 (1425-1500 Warren, 1980)	
571	San Lazaro Glaze Polychrome	1490-1515	
572	Puaray Glaze Polychrome (early)	1515-1600	
573	Puaray Glaze Polychrome (late)	1600-1650	
579	Late Glaze	1600-1700	
580	Kotyiti Glaze Yellow	1650-1700+	
581	Kotyiti Glaze Red	1650-1700+	
582	Kotyiti Glaze Polychrome (light slip)	1650-1700+	
583	Kotyiti Glaze Polychrome (red slip)	1650-1700+	
584	Pecos Polychrome	1515-1624 (Glaze V)	
586	Cicuye Glaze White, Late F		
601	Undetermined B/W		
602	Undetermined B/R		
603	Undetermined B/W and Red Matte		
604	Undetermined Red/Brown		
605	Plain Polished		
606	Plain, White Polished		
607	Plain, Red Polished		
608	Plain White		
610	Puname Polychrome	1680-1900+	
611	Puname Sandstaone Tempers		
615	Gobernador Polychrome	?1690-1775?	

Pottery Type Code		Date Range	Synonyms
616	Navajo Polychrome		
620	Casitas Red/Brown	1600-1900 (1690-1900 Warren, 1979a)	
621	Casitas Red		
622	Casitas Plain		
623	Casitas Red/White		
625	Ashiwi Polychrome	1700-1770	
626	Matsaki Polychrome		
627	Matsaki Brown/Buff		
628	Mineral, White, Red		
630	San Bernardo Polychrome		
631	Acoma Polychrome	(?) 1875 - Present	
632	Mineral Red		
633	Ako Polychrome	1680-1900	
701	Undetermined B/W		
702	Undetermined Black/Red		
703	Undetermined B/W and Red Matte		
704	Undetermined Red/Brown		
705	Undetermined White/Red		
706	Undetermined Black/Cream		
707	Redware (Historic)		
708	Buff or Brownware (Historic) Undifferentiated		
709	Whiteware (Historic) Undifferentiated		
710	Tewa Polychrome	1675-1720	
715	Ogapoge Polychrome	1720-1800+	
716	Ogapoge Polychrome and Red Matte	1720-1800+	
720	Powhoge Polychrome		
721	Grayware (Historic)		
800	Undifferentiated, China		

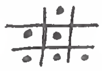
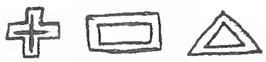
Pottery Code	Vessel Form
00	Undetermined
02	Bowl Undifferentiated
03	Bowl Hemispherical
04	
05	Bowl Carinated
06	Bowl Flanged
07	Bowl "Soup Plate"
08	Bowl Shouldered
09	Bown Ring Based
20	Closed Form Undifferentiated
21	Jar or Olla
22	Jar Carinated
25	Tecomate
26	Seed Jar or Squash Jar
30	Pitcher
35	Ladle
36	Ladle Handle
40	Canteen, Undifferentiated
41	Canteen, Stirrup
45	Cylinder, Undifferentiated
46	Vase
50	Cup
60	Effigy, Undifferentiated
61	Duck Pot
65	Ceramic Pipe
70	Miniature, Undifferentiated
80	Handle, Undifferentiated
81	Handle Lug
82	Handle Strap
83	Handle Loop
90	Puki Lining

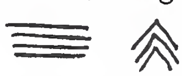
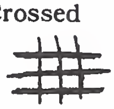
Pottery Code	Surface Color
01	Undetermined
02	White
03	Light Gray
04	Dark Gray
05	Tan
06	Brown
07	Pink
08	Orange
09	Red
10	Red-Brown
11	Black
12	Cream
13	Yellow
14	Orange-Red
15	Gray Brown
16	Gray, Medium
17	Red Gray
20	White + Red
21	Pink + Red
22	Yellow + Red
23	Red + Orange
24	Cream + Red
25	Red, Micaceous
26	Black, Micaceous
27	Tan, Micaceous
28	Red + Tan

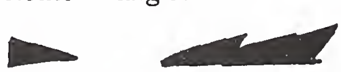
Pottery Code	Surface Finish
01	Undifferentiated; Undetermined
99	Undifferentiated; Undetermined
02	Unpolished Interior; Polished Exterior
03	Polished Interior; Unpolished Exterior
04	Unpolished Interior; Unpolished Exterior
05	Polished Both Sides or Jar Exterior
06	
07	Unpolished Interior
08	Unpolished Exterior
09	Polished Interior (Bowls), Scored Exterior
10	Polished Exterior (Jars), Scored Interior
11	Smoothed Interior; Scored Exterior
12	Polished, Smudged Interior; Unpolished Exterior
13	Polished, Smudged Both Sides
14	Polished, Smudged Interior; Polished Exterior
15	Corrugated
16	Smoothed, Both Sides
17	Polished, Both Sides
18	Polished Exterior; Corrugated Interior
20	Burnished Interior
21	Burnished, All Surfaces
22	Burnished Interior; Fine Banded, Patterned Exterior
23	Smoothed Interior; Fine Banded Exterior
29	Polished, Smudged Interior; Ribbed Exterior
30	Polished, Smudged Interior; Mica Slip Exterior
40	Stone Stroked Parallel to Rim
41	Stone Stroked Interior Bowls; Parallel
42	Stone Stroked Exterior, Closed Forms
43	Stone Stroked Both Sides Parallel to Rim
44	Polished Exterior (Unpolished Interior)
45	Tool Impressed Exterior

Pottery Code	Slip
01	Undetermined
02	Unslipped (or leave blank)
03	Slipped Inside
04	Slipped Interior and Exterior Below Rim
05	Slipped Interior and Exterior
06	Slipped Exterior (Jars)
07	Slipped Exterior and Interior Neck (Jars)
08	Slipped Exterior and Interior (Bowls)
09	Slipped Exterior (Bowls)
10	Slipped Exterior

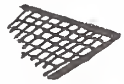
Pottery Code	Designs
001	Undetermined
002	Hooks, Flags 
003	Open Geometric, Filled with Lines 
005	Open Geometric 
006	Stepped Angles 
010	Dots 
011	Dots, Framed 
012	Dots, Framing 
013	Hatching, straight line with heavy band and checkerboards
015	Pendent Dots 
016	Pendent Ticking, Lines 
017	Pendent Ticking, Solids 

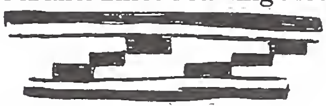
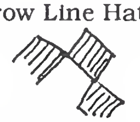
Pottery Code	Designs
018	Pendent Dots and Frets 
019	Lines and Dots, and Sawteeth 
020	Z's W's 
021	Framed Z's 
022	Dotted Squares 
023	Dotted Solids and Fine Lines
024	Dotted Solids and Dotted Lines
025	Framed Slashes 
026	Framed Elements 
029	Square Scrolls 
030	Scrolls, Circles 
031	Starred Circles 

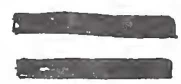
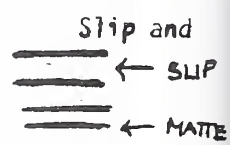
Pottery Code	Designs
032	Hatching, Straight Line with Heavy Band 
033	Lines and dots, and Board Lines 
034	Fine lines and solids 
035	Medium Lines and Solids (same as above with medium lines)
036	Broad Lines Framing Solids
037	Scrolls and Solids 
038	Triangle and Dots, and Lines 
039	Lines, Parallel, Curved (2mm) 
040	Lines, Parallel, Straight (to 2mm) 
041	Lines, Pendent from Rim 
042	Lines, Crossed 
043	Lines Pendent from Rim Uneven 

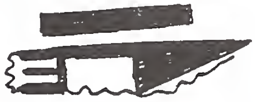
Pottery Code	Designs
045	Lines, Medium (2-4mm) 
046	Line Parallel, Chevrons 
050	Lines, Broad (4-10 mm) (Sosi Style, Geometric) 
055	Steps, Frets 
056	Pennants, Long 
057	Pennants and Frets
058	Medium and Broad Lines
059	Pennants and Pendant Dots
060	Solid Elements 
061	Sawteeth 
062	Checkerboards 
063	Acute Triangles 

Pottery Code	Designs
064	Triangle Checkerboard 
065	Lines Framing Solids 
066	Lines Framing Triangles 
067	Solids Framing Lines 
070	Hachures, Misc. 
071	Squiggles 
072	Framed Squiggles 
073	Hatching, Straight Line 
074	Heavy Framing Lines 
075	Narrow Line Hatching 
076	Cribbing 
078	Rickrack Framing Solids

Pottery Code	Designs
079	Fine Cross Hatching 
080	Opposed Hatching and Solids 
090	Interlocking Hatches and Solids 
091	Wide Lines and Narrow Lines 
092	Rickrack and Sawteeth 
093	Framed Squiggles and Solids
094	Framed Squiggles and Broad Lines
095	Barbed Wire 
096	Open Sawteeth (Rickrack) 
097	Framed Squiggles and Narrow Lines
098	Frets and Parallel Lines 
099	Parallel Lines Circling Rim and Bars

Pottery Code	Designs
100	Parallel Framing Bands 
101	Parallel Lines Encircling Rim 
102	Parallel Lines Framing Motifs 
103	Line Encircling Rims 
104	Parallel Lines
105	Narrow Line Hatching in Diamonds 
106	Curved Lines 
107	Solids, Framing Lines, Squiggles
108	Alternating Wide and Narrow Bands Frames in a Narrow Band 
109	Parallel Lines Encircling Rim Plus Eyes and Blocks 
110	Framed Hachures and Solids
201	Flower Motifs, Misc..

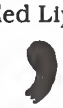
Pottery Code	Designs
202	Open Flower Motifs 
203	Solid Motifs 
204	Plant Motifs 
210	Open Space Motifs 
220	Rainbirds, Misc.. 
221	Feathers 
223	Eyes 
224	Glaze Framed Red (Slip?) 
225	Framed Geometric (Glaze; Red Matte) 
226	Glaze Framed Red Slip and Red Matte 
227	Hatching and Dots 
230	Arcs; Scallops 

Pottery Code	Designs
231	Framed Solids and Sawteeth 
240	Bars 
241	Bars and Crosses 
242	Naturalistic-Bird
243	Framed Geometric (Glaze; White Matte) 
244	Pennants and Bars 
245	Framed Squiggles and Frets 

Pottery Code	Paint
01	Undetermined
02	Mineral Red
03	Mineral Brown
04	Mineral Black
05	Mineral Green
06	Glaze, Undifferentiated
07	Glaze, Black
08	Glaze, Green
09	Glaze, Framing Red Matte
10	Glaze, Framing White Matte
11	Glaze, Brown
15	White Matte
19	Red Matte (usually broad lines)
20	Red Matte
21	Red Matte, Framed Black
22	Red, Black, Mineral Paint
23	Red, Black, Brown Mineral
29	Fugitive Red; Exterior of Vessel
30	Carbon Black
35	Carbon and Mineral Paint

Note: If no paint or side where paint would be is spalled off, etc., then leave blank.

Pottery Code	Rims, Necks
01	Undetermined
02	Vertical, Misc.
03	Vertical, Direct, Rounded 
04	Vertical, Direct, Squared 
05	Vertical, Direct, Tapered 
06	Vertical, Direct, Beveled In 
07	Vertical, Direct, Beveled Out 
08	
09	Inverted 
10	Recurved 
11	Direct, Expanded 
15	Direct, Vertical (Jar) 
16	Direct, Everted (Jar) 

Pottery Code	Rims, Necks
17	Everted (Jar) 
20	Everted, Misc. 
21	Everted Flared (Bowl) 
22	Everted, Flared (Jar) 
23	Vertical, Everted (Jar) 
24	Everted, Rolled Rim 
25	Everted (Glaze C) 
26	Glaze D 
27	Glaze E 
28	Glaze E "M" 
30	Glaze F 
31	Direct, Rolled, Flat 
32	Expanded Lip (Glaze B) 

Temper Code	2000-0999	General
0001	Undetermined	
9999	Undetermined	
0003	Igneous, Undifferentiated	
0004	Metamorphic Undifferentiated	
0009	Ashes and Sand (Puki Lining)	
0037	Volcanic, Undifferentiated	
0100	Sherd, Undifferentiated	
0101	Sherd, Angular Fine Fragments (less than 0.25 mm)	
0102	Sherd, Angular Medium Fragments (.25-0.5 mm)	
0103	Sherd, Angular Coarse Fragments (0.5-1.0 mm)	
0104	Sherd, Angular Very Coarse Fragments (1-2mm)	
0200	Quartz Grains, Undifferentiated	
3181	Trachyte (also listed on igneous rock page)	
4560	Schist, Quartz Muscovite, Undifferentiated, (Upper Rio Grande) (also listed on metamorphic rock page)	
2000	Sandstone Undifferentiated	

Note: Temper categories used in general temper analysis.

Temper Code	2000-2094	Sandstone
2000	Sandstone, Undifferentiated	
2015	Sandstone, Very Fine Grained (less than .0125 mm), Undifferentiated	
2021	Sandstone, Fine Grained, Micaceous, Undifferentiated (0.125-0.25 mm)	
2025	Sandstone, Coarse Grained, Micaceous	
2040	Sandstone, Fine Grained, Subangular Grains, Undifferentiated	
2040-12	Sandstone, Fine Grained, Friable, Sugangular Quarts, Powdery White Cement +/- Gray Fragments	
2040-13	As Above, + Sherd Temper (white, light gray)	
2041	Sandstone, Fine Grained, Subangular + Round Grains, Undifferentiated	
2042	Sandstone, Fine Grained, Subangular + Clear + Colored, Undifferentiated	
2043	Sandstone, Fine Grained, Subangular + Rounded, Some Color, Undifferentiated	
2050	Sandstone, Medium Grained, Clear, Subangular Quartz, Undifferentiated (0.25-0.5mm)	
2051	Sandstone, Medium Grained, Clear, Subangular Quartz to Rounded Grains, Undifferentiated	
2052	Sandstone, Medium Grained, Clear, Subangular + Colored Grains, Undifferentiated	
2053	Sandstone, Medium Grained, Clear, Subangular + Colored Grains + Rounded Grains, Undifferentiated	
2061	Sandstone, Fine to Coarse Grain (0.125-1.0+) Undifferentiated	
2080	Sandstone, Coarse Grained, Subangular Grains, Undifferentiated (0.5-2.0mm)	
2081	Sandstone, Coarse Grained, Subangular Grains, to Rounded, Undifferentiated (0.5-2.0mm)	
2082	Sandstone, Coarse Grained, Subangular Grains Clear and Colored	
2083	Sandstone, Coarse Grained, Subangular Grains Clear and Colored + Rounded	
2085	Sandstone, Coarse Grained, Feldspathic, Undifferentiated (less than 15%)	

2085	Sandstone, Coarse Grained, Feldspathic, Undifferentiated (less than 15%)
2090	Sandstone, Hematitic, Undifferentiated
2091	Sandstone, Limonitic, Undifferentiated
2092	Sandstone, Magnetitic, Undifferentiated
2093	Sandstone, Manganitic, Undifferentiated
2094	Sandstone, Calcareous, Fine Grained, Undifferentiated

Temper Code	2100-2123	Sandstone
2100	Gallup Sandstone Hematitic	
2101*	Sandstone, Chuska Sandstone	
2102	Sandstone, Cretaceous, Undifferentiated	
2104	Nacimiento Formation Sandstone, Feldspathic	
2105	San Jose Formation Sandstone	
2111	Mancos Shale, Sandstone, Coarse	
2112	Morrison Formation Sandstone, Pink to Milky White Cement (see 2130)	
2112-11	Quartz, Fine-Medium, Feldspar Rhombs, Pinkish, Vitreous, White Chalcedonic Cement, +/- Platy Magnetite, + Sherd, White to Light Gray	
2112-16	Quartz, Fine-Medium, Feldspar Rhombs, Pinkish, Vitreous, White Chalcedonic Cement, +/- Platy Magnetite	
2113	Chinle Formation Sandstone	
2115	Ojo Alamo Sandstone	
2118	Dakota Sandstone	
2121	Menefee Sandstone	
2123	Cliff House Sandstone	

Temper Code	2101	Chuska Sandstone
2101-10*	Quartz, Round, Clear; Icy; Pink: Medium-Coarse 0.3-1.0 Sandstone Fragments; Inclusions: Sandstone Cement White +/- Opal; Light Gray Clay Pellets; Clay; Light Tan, Soft Break; Hackly	
2101-11*	Quartz, Medium-Round, Clear + Milky Opan; Inclusions: + Sherd; Trachyte (less than 0.5mm);' Clay: White +/- Dark Core	
2101-12*	Quartz, Medium-Round, Clear + Milky Opal; Inclusions: Crushed Sherd; Clay: White-Medium Gray; Fine Granular; Indurated	

Temper Code	2113	Chinle Sandstone
2113-10	Quartz Clear +/- Colored, Subangular to Rounded; Feldspar Icy White +/- Pink; Black Clay Plates; Clay White, Cream to Black; Brittle; 0.5-1.0 mm	
2113-11	As Above, less than 0.5 mm	
2113-12	Sandstone as above; + White Clay Pellets; Cream, Soft, Dull, Hackly to Granular Clay; 0.5 mm	
2113-13	Sandstone as above; +/- Crystal Faces; +/- Colored Grains; Sandstone Fragments; Clay Tan, Friable	
2113-14	As 2113-10 + Coarse White Angular Sherd; +/- Rock Fragments	
2113-15	As 2113-11 + Crushed Sherd; Medium Grained, White	
2113-16	Grains less than 0.5 mm; Crushed Sherd, Medium-Coarse, White +/- Clay Pellets; Cream Colored; Dull, Silty, Granular	
2113-17	Ca. 0.5 mm; Quartz Angular, Sparse; +/- Orange Grains; Crushed Sherd, Medium Grain, White to Gray; White Siltstone Fractures and Black Oblate Clay Plantes; Clay Silty, White to Light Gray to Dark Gray	
2113-18	As 2113-10 With Light Gray, White Soft Clay Paste	
2113-19	As 2113-14 + Vitreous Gray Clay, Conchoidal Fracture	
2113-20	Quartz Clear + Colored; Subangular to Round; High Quartz; Feldspar +/- Pink; Medium Grained; Crushed Sherd, Medium White; Light Gray to White Glassy Fragments; Clay Creamy White, Granular, Silty	
2113-21	Feldspar, Light Gray, Ab. (San Mateo Area)	
2113-22		
2113-23	Quartz, CLear, Colored, Subangular to Round; Orange Grains; Crushed Sherd: White, Fine-Medium; White to Pink Cement?; Clay White, Gray +/- Tan; San Mateo Area	

Temper Code	2130-2770	Sandstones
2130	Prewitt Member, Morrison Group (see 2112), No Cement	
2131	Brushy, Basin Member, Morrison Group	
2140	Mesa Verde Group Sandstone, Fine to Medium Grained; Undifferentiated	
2140-14		
2150	Gallup Sandstone, Coarse Grained, Feldspathic	
2155	"Buffalo Springs" Sandstone; Fe Grains, Rounded	
2470	Volcanic Sandstone, Undifferentiated	
2470-10	Volcanic Sandstone, Coarse Grained Quartz, Pumice, Silver Mica (Placitas Area)	
2470-11	Volcanic Sandstone, Quartz, Andesite, Chalcedony, Varicolored, Gold Mica	
2471	Volcanic Sandstone + High Wuartz, +/- Pumice, Colored, Polished Chalcedony	
2472	Volcanic Sandstone As 2471, + Mica	
2477	Volcanic Sandstone, High Quartz, Colored Grains	
2478	Volcanic Sandstone, High Quartz, Colored Grains, + Hornblende, Feldspar	
2770	Caliche, Fine Powdery + Quartz, Sparse	

Temper Code	3000-3110-10	Igneous Rocks
3000	Granitic Rocks, Phaneric, Felsic, Undifferentiated	
3001	Aplite, Fine Grained; Light Colored, Sugary Textured Igneous Rock	
3025	Intermediate Igneous, Finely Crystalline, Undifferentiated	
3025-10	Intermediate Igneous, With Feldspar, Gold Mica, Pyroxene	
3025-11	Intermediate Igneous, With Feldspar, Gold Mica, Pyroxene	
3055	Igneous Rock, Dark Gray Glassy Matrix + Feldspar	
3070	Porphyry, Light Colored; Granitic to Intermediate; Usually With Quartz	
3100	Granite, Undifferentiated	
3101	Granite, Pink to Orange Feldspar, Muscovite	
3110	Aplite, Undifferentiated	
3110-10	Aplite: Fine Grained with Clear Quartz and Icy White Feldspar; Sparse Gold Colored Mica; Magnetite Grains (Cochiti Area?)	

Temper Code	3181-3266-10	Igneous Rocks
3181	Trachyte (Trachybasalt), Chuska Mountains	
3240	Diorite, Undifferentiated	
3241	Diorite, Hornblende, Undifferentiated	
3242	Diorite, Hornblende, Very Fine Grained	
3260	Augite Latite, Espinaso Volcanics (San Marcos Variety)	
3261	Augite Latite, Undifferentiated	
3263	Augite Latite, Matrix Fine Granular + Minute Red, Black Inclusions (Gipuy Variety)	
3264	Augite Latite, + Magnetite Inclusions (Galisteo Basin)	
3265	Augite Latite, Biotite	
3266	Hornblende Latite, Undifferentiated	
3266-10	Hornblende Latite, + Red Clay (Galisteo Basin + ?)	

Temper Code	3267-3301	Intermediate Igneous Area
3267	Hornblende Latite, Undifferentiated (Datil Area)	
3270	Hornblende Latite, Espinaso Volcanics (Tonque Temper)	
3270-10	Hornblende Latite + Coarse Sand, Orange Feldspar; Galisteo Pueblo?	
3270-11	Hornblende Latite + Euhedral Gold Mica Flakes (Cochiti?)	
3270-12	Hornblende Latite	
3300	Andesite, Undifferentiated	
3301	Andesite, Hornblende, Undifferentiated (San Juan Valley)	

Temper Code	3400-3431-11	Basalt
3400	Basalt, Fine Grained Crystalline, Undifferentiated	
3405	Basalt, Fine Grained Crystalline, Amber-Colored; Olivine (San Felipe, Cochiti Area)	
3406	Basalt, Fine Grained Red, Black Flaky Texture	
3420	Basalt, Diabase, Undifferentiated	
3421	Basalt, Diabase, (Zia Temper)	
3430	Basalt, Scoriaceous, Red, Gray, Undifferentiated	
3431	Basalt, Scoriaceous, Reddish Gray, Low Density (Cochiti Area)	
3431-10	Basalt Scoriaceous, Glassy Red, Vesicular, (Cochiti Area)	
3431-11	Basalt, Scoriaceous, (White Mica in Red Slip)	

Temper Code	3655-3655-13	Crystal
3655	Pumice, Crystal; Jemez Mountains, Coarse Grained, Subhedral to Euhedral High Quartz; Silky to Frothy White to Pink Cellular Pumice	
3655-10	Pumice; White and Black Shards, High Temperature Quartz and Clear Feldspar; White Rock Canyon, Santo Domingo Valley	
3655-11	Pumice, Fine Grained Vesicles; Frothy with Sparse Coarse Grained High Tempearture Quartz and Clear Vitreous Feldspar; Southern Pajarito	
3655-12	Pumice, as above, but with Fine to Medium Grained Fragments	
3655-13	Pumice, White, Frothy + Brown Hornblende Laths in Pumice	

Temper code	3710-3852-10	Volcanic Rocks Welded Tuffs
3710	Andesite Vitrophyre, Undifferentiated; Jemez Mountains, Gray to Black with Phenocrysts; Hypersthene Present (S. Pajarito, Cochiti)	
3811	Rhyolite Tuff; Undifferentiated; Welded (Devitrified); Jemez Mountains, Bandelier Tuff	
3811-10	Rhyolite Tuff, Light Gray, with Vitreous Quartz and/or Feldspar	
3816	Welded Tuff, White Soft Matrix (Possibly Mogollon Temper Type); Undifferentiated	
3820	Welded Tuff, Intermediate, Devitrified, Undifferentiated	
3821	Welded Tuff, Andesitic; Devitrified, Undifferentiated (Jemez Mountains)	
3821-10	Welded Tuff, Andesitic; Glassy Black	
3852	Lithic Tuff, Undifferentiated	
3852-10	Lithic Tuff, Undifferentiated + High Quartz Crystals, Pyroxene, Black Glass	

Temper Code 3860-3864 Vitric Tuffs

3860	Vitric Tuff, Undifferentiated
3862	Vitric Tuff, White, Undifferentiated
3862-10	Vitric Tuff, White, With Fine to Medium Grained, Subrounded, Colored Quartz (Espanola Valley, etc.)
3862-11	Vitric Tuff, White; Very Fine Grained, (Dense Gray Clay Paste, Jemez Mountains)
3862-12	Vitric Tuff, White; Very Fine Grained, (Light Gray Clay) + Silver and Gold Mica, Hornblende
3863	Vitric Tuff, Black Shards (in Cross-Section), Undifferentiated; (Pajarito Plateau, Jemez Mountains)
3863-10	Vitric Tuff, Black Shards, +/- Sparse Medium Grained Quartz, Gold Mica
3863-11	Vitric Tuff, + Fine to Coarse, Round Grains of Colored Quartz (Espanola Valley)
3863-12	Vitric Tuff, Black Shards, Finely Crushed, (Indurated Tan Clay)
3864	Vitric Tuff, White Shards, + Fine Grained Colored Sand, Gold, Silver Mica (Nambe)

Temper Code 4020-4563 Metamorphic

4020	Quartzite, Friable Undifferentiated
4560	Schist, Quartz Muscovite; Undifferentiated (Upper Rio Grande)
4560-10	Schist, Quartz Muscovite; Very Finely Granular, Clear Quartz (Picuris?)
4561	Schist, Quartz Muscovite (Tijeras Schist)
4562	Schist, Quartz Muscovite; (Placitas Area)
4562-10	Schist, Quartz Muscovite, White Mica, Quartz, Sherd, +/- Calcite
4563	Schist, Quartz Mica (South Manzanos)

Temper Code II - Secondary Temper Category

01	Sherd Undifferentiated
99	Sherd Undifferentiated
02	Sherd Fine-Medium (0.2-0.5 mm)
03	Sherd Coarse (0.5-1.0 mm)
04	Sherd Coarse-VeryCoarse (0.5-2.0 mm)
09	Variety, Undifferentiated
10	(to 30) Unspecified Varieties

Misc.

Grain Sizes

51	Very Fine (less than 0.2)
52	Fine to Medium (0.2-0.5)
53	Coarse (0.5-1.0 mm)
54	Very Coarse (0.5-2.0)
59	+ Crystal Faces

Quartz (Sand)

60	Quartz Grains (Sparse), Undifferentiated
61	Quartz Very Fine (0.2 mm)
62	Quartz Fine Medium (0.2-0.5 mm)
63	Quartz Coarse (0.5-1.0 mm)
64	Quartz Coarse-Very Coarse (0.5-2.0 mm)
65	Sandstone Fragments, White
66	Quartz, Fine + Coarse
67	Sandstone Fragments, Hematitic, Magnetit
68	Hematite, Magnetite Fragments
69	Siltstone Fragments

Other Misc.

70	Clay Plates, Coarse, Flat
71	Clay Plates, Coarse, + Quartz
72	Clay Plates, Coarse, + Quartz, + Sherd
73	Clay Pellets, Rounded +/- Quartz
75	Mica
76	Hornblende, Black
77	Caliche Fragments +/- Sand
80	Feldspar
81	Feldspar, Pink
82	Igneous
85	Aphanite Gragments
86	Sandstone Fragments

Note: Category 60 was used to indicate sandstone as secondary temper in the general temper analysis.

Category 75 was used to indicate mica as secondary temper in the general temper analysis.

Pottery Code	01-78	Special Features
01	Black (or brown) Painted Rim (solid)	
02	Red Painted Rim (solid)	
03	Ticked Rim	
04	Slashed Rim	
05	Carina, Interior Rim	
06	"Rolled" Rim	
07	Red Painted Lip	
10	"Wiyo Line"	
11	Broad Red Line Below Design	
12	Crazed Slip	
13	Broad Red Line Below	
14	Red Slipped Base	
16	Fugitive Red Paint	
17	Hematite Stains	
18	Tool Impressed	
19	Mineral Red Pigment	
20	Incised Design	
21	Punctate Design	
22	Black Line Along Top of Lip or Brown on Lip	
30	Worked Sherd, Edges	
31	Worked Edges, Straight	
32	Worked Edges, Curved	
33	Worked Edges, Flat, Abraded	
34	Worked Edges, Rectangle	
36	Worked Edges, Incised	
37	Worked Sherd, Not Abraded	
38	Worked Sherd, Rounded	
39	Worked Sherd; Drill Hole	
40	Red Fired Interior	
45	Coil 2-5 mm	
46	Coil 4-6 mm	
47	Coil 6-8 mm	
48	Coil 8-12 mm	
49	Coil Greater than 12 mm	
55	Stone Stroked Polished Parallel	
56	Stone Stroked Interior, Parallel	
57	Stone Stroked Exterior, Parallel	
58	Stone Stroked Both Sides	
70	Minor Percentage Trachyte Temper (possibly from sherd temper)	
75	Smeared, Indented Corrugated (when already has a regular type designation)	
76	Clapboard (when already has a regular type designation that does not indicate clapboard)	
77	Neckbanded (when already has a regular type designation that does not indicate neckbanded)	
78	Plain Band Around Center of Corrugated Jar	

Pottery Code			Cultural Period
1	Undifferentiated		
2	Basketmaker III	500-850	Lino Gray; San Marcial B/W
3	Pueblo I	850-950	Piedra B/W, Kiatuthlanna
4	Pueblo II	950-1175 (or 1225)	Red Mesa B/W; Kwahe'e B/W
5	Pueblo III	1200-1300	
6	Pueblo IV (Rio Grande Glazes)		
7	Historic: 1600-1700+		
8	Historic: 1700-1900		

Dates quoted from Volume 4, "Cochiti Reservoir" (O.C.A.) page 104, 1979.

Note: Code time period type is most normally associated with.

Pottery Code	Source Area
01	Unknown
02	Cochiti Area
03	Pajarito Plateau, South
04	White Rock Canyon
05	San Felipe
06	Santo Domingo Valley
07	Bernalillo Area
08	Tonque Basin
09	
10	Zia Villages
11	Galisteo Basin
12	San Marcos Pueblo
13	Pecos Pueblo
14	Placitas Area
15	Tijeras Canyon
17	Middle Rio Grande Valley
18	Middle Rio Grande: T or C to Albuquerque
19	Upper Middle Rio Grande: Albuquerque to White Rock

Pottery Code	Source Area
20	Upper Rio Grande
21	Pajarito Plateau (North)
22	Espanola Valley
23	Nambe/Tesuque Valleys
30	Pottery Mound
31	Gran Quivira
32	Quarai
33	Abo
34	Salinas District
36	Jornada Area, SE NM
40	NE New Mexico
42	Acoma Region
43	Rio Salado/Alamocito Area
44	Upper Little Colorado
45	Red Mesa Valley
46	Red Mesa Valley (East)
50	San Juan Valley
51	Four Corners Area
52	Chuska Valley

Pottery Code	Vessel Part
Leave blank if indeterminate.	
01	Rim (may also include part of body)
02	Body
03	Base
04	Lug or Handle
05	Rim with Lug or Handle
06	Body with Lug or Handle
07	Other

Pottery Code	Sooting
Leave blank if not applicable.	
50	surface Sooted, Inter
51	Surface Sooted, Exterior
52	Surface Pitted (Spall)
53	Surface Sooted, Interior and Exterior

Pottery Code	Wall Thickness
Leave blank if not a body sherd (category only for body sherds).	
00	Indeterminate (or blank or not appropriate)
40	Walls 2-4 mm thick
41	Walls 5-7 mm thick
42	Walls 8-9 mm thick
43	Walls 10-12 mm thick
44	Walls greater than 12 mm thick

Pottery Code Orifice Diameter

Leave blank if not Rim (category only for rim sherds) or too small to determine.

Enter as a direct measurement.

Percent of Rim Present

Leave blank if not Rim (category only for rim sherds) or too small to determine.

Enter as a direct measurement.

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Note: Dates for ceramic types are those listed on A. H. Warren's original ceramic code. The above-listed references apply to additional date ranges added to certain ceramic types, and to additional types added by C. B. Raish.

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Chapter 20 • Historic Sites

Charles Haecker and Louanna Haecker

Farmington Area History

The Farmington area was homesteaded during the 1870s, when hundreds of settlers moved to the fertile lands where the Animas and La Plata Rivers converge to form the San Juan River. The Navajos who were living in the San Juan Basin referred to the new settlement as "Totah" which, roughly translated, means "place where three rivers meet" (Cooper 1981).

The abundance of water, the sunny south slopes of the San Juan Mountains, and the high altitude were ideal for fruit trees. By the 1890s, the Farmington area was noted for its apples, peaches, and pears; in less than 20 years it was considered to be a self-sufficient locality with its fruit crop, dairy herds, alfalfa, and sheep (Anon. 1965).

Farmington began in the 1870s as an unincorporated locality; the area that was to become a town consisted of an unplanned grouping of orchards, homes of merchants and farmers, and an occasional general store. However, community identity became a reality with the establishment of a combination schoolhouse-church during the 1880s. With this symbol of stability, according to one Farmington historian, the town's future was assured, and more people were encouraged to settle at the rivers' confluence. In 1901, Farmington was incorporated and, with an increasingly affluent tax base, by 1915 it boasted an electric generating plant, a water and sewage system, telephone service, a high school, and a grade school (Simpson 1936:5).

The economic base of the town of Farmington, during the late nineteenth and early twentieth centuries, was primarily shipping agricultural produce and livestock. Farmers, cattlemen, and Navajo sheepherders greatly benefitted with the arrival of a branch of the Denver and Rio Grande Railroad in 1879. By 1915 the area's interstate commercial trucking was enhanced by the highway improvement of what was to become U.S. 550 into Arizona and Colorado (Simpson 1936: 1-3).

As the transportation and commercial hub of the Four Corners region, Farmington was also the major trading center for the Navajo, with several well-stocked trading posts within Farmington and its environs providing an outlet for the wool, blankets, and other native goods produced by the Navajo. Of equal importance was the discovery of the Four Corners region by the nascent tourist industry. The Farmington Chamber of Commerce during the 1920s (and up to the present) encouraged the development of tourism with travel brochures and magazine articles that touted the natural beauty of the region, while assuring the reader that Farmington "has all the modern amenities of the twentieth century" (Anonymous n.d.)

In 1907, a group of Farmington investors took a calculated risk that commercially abundant oil could be found in the area. An experimental oil well was drilled just south of the town, where a natural gas deposit so rich was found that it could be ignited at the surface. This first well was considered a failure since only gas was produced — a product which at the time was considered worthless (Anon. 1965: 18). However, by the 1920s several oil fields were discovered and exploited, and in 1930 the first gas pipeline was built to Albuquerque and Santa Fe from the Farmington area. In the 1950s, the first transcontinental pipeline network was completed. It carried natural gas from the San Juan Basin to the West Coast and the Pacific Northwest. This resulted in the second major economic development in the Basin. Oil continued to be found and extracted, but it became of secondary importance compared with natural gas. (Cooper 1981: E-1 — E-2.)

From 1950 to 1958, Farmington was the fastest-growing town in New Mexico; its population increased from 3,573 to well over 30,000. At the height of the petroleum boom, three major oil companies had regional offices in Farmington, and numerous other companies had district offices. Yet the leaders of this fast-growing city realized that economic diversity was essential; during the 1960s and 1970s, various other industries were encouraged to relocate in San Juan County. This diversification buffered the decline in Farmington's energy industry during the 1980s (Anon. 1965: 1-2).

Farmington Historic Sites

All of the sites within the Farmington survey boundaries are located in San Juan County. The sites were plotted on the Farmington North, Farmington South, Flora Vista, Kirtland, and Horn Canyon, 7.5 minute topographic maps and on the Bloomfield 15 minute quadrangle.

LA 33721 (FA 1-3)

Elevation: 5860 ft.

Map Source: 7.5' Farmington North

Physiography: ridge

Vegetation: pinyon, juniper

Site Description: This trash scatter is eroding into a gully. Collected artifacts include: several bottle bases, a metal curling iron, and two dinnerware fragments.

Artifact Analyses: Two of the collected bottle bases were dated. The "Lambert Pharmaceutical Company" used bottles made by the Obear-Nester Glass Company of St. Louis, Illinois, between 1895-1915 (Toulouse 1972: 373); the other bottle base displays an "Owen's" mark dated between 1911-1929 (Toulouse 1972: 393). One fragment of collected dinnerware shows the partial hallmark:

—DERWOOD

W. S. GEORGE

A date for this mark was not found. The other ceramic piece appears to be part of a child's drinking cup with a raised design of three girls' arms locked together; the girls are wearing Dutch-type caps and wooden clogs.

Date Range: 1900s—1930s

LA 33722 (FA 1-4)

Elevation: 5800 ft.

Map Source: 7.5' Flora Vista

Physiography: ridge

Vegetation: pinyon, juniper

Site Description: The site consists of a trash scatter of bottle glass, cans, broken dinnerware and carnival glass fragments. The survey crew suggested that the debris was deposited after 1950 and did not collect any materials. However, several bottle base Maker's marks were sketched on the site form.

Artifact Analyses: Several of these marks were located in Bottle Makers by Toulouse (1972). Marks for the following companies were recorded and dates have been added:

1. Maryland Glass Corporation of Baltimore produced the cobalt blue bottles labeled "Bromoseltzer" for the Emerson Drug Company since 1916 (p.339).
2. Hazel-Atlas Glass Company of Wheeling, West Virginia, 1920-1964. Two marks of this company were sketched (p. 264).
3. Whitall-Tatum & Company logo, used from 1935-1938 (p. 544).
4. Two bottle bases had marks produced by the Owens-Illinois Glass Company from 1929 to 1954 (p. 403).
5. One sketched mark showed a triangle pointed down. No match could be found for this, but the Reed Glass Company of Rochester, New York, had a mark from 1927 to 1956 of a triangle pointed upright.

Two marks for which companies were not assigned were a star and a "C" in a circle.

An aquamarine bottle base embossed with "B 2" dated between 1880 and 1910, based on the color (Ward et al. 1977: 240). There are several companies for each of these marks.

Date Range 1920s—1960s

LA 33725 (FA 1-7)

Elevation: 5600 feet

Map Source: 7.5' Farmington North

Physiography: hill

Vegetation: pinyon, juniper

Site Preparation: This site is a trail that extends down from the crest of the hill for a total distance of approximately 600 feet. Scrape marks and rust stains are present along the sides of the sandstone boulders that border the trail; the survey crew suggested that these marks were caused by horse-pulled wagons with iron hoops on the wheels. No artifacts were found associated with the trail.

Date Range: Not known.

LA 33726 (FA 1-8)

Elevation: 5400 feet

Map Source: 7.5' Kirkland

Physiography: ridge

Vegetation: juniper, native grasses

Site Description: This site is an apparent roadbed, constructed by the placement of a 60 foot long, dry-laid retaining wall. The roadbed itself is badly eroded. No artifacts were noted in association with roadbed.

Date Range: Not known.

LA 33729 (FA 2-1)

Elevation: 5750 feet

Map Source: 7.5' Farmington North

Physiography: arroyo wash

Vegetation: pinyon, juniper chaparral

Site Description: This is a trash scatter that includes hole-in-top cans, pocket-style tobacco tins, dinnerware fragments, and purpled bottle glass.

Date Range: 1913-1925, based on the tobacco tins and purpled glass (Music 1971: 54; Newman 1970: 70-75).

LA 33730 (FA 2-2)

Elevation: 5790 feet

Map Source: 7.5' Farmington North

Physiography: erosional slope

Vegetation: pinyon, juniper chaparral

Site Description: The site is the location of a drilling operation. Observed features include: a drill casing embedded in the ground, a probable hearth, a cobble pile located near the hearth, a coal slag pile to the southwest of the pipe casing, and a can and glass midden. No artifacts were collected.

Date Range: Not known.

LA 33731 (FA 2-3)

Elevation: 5900 feet

Map Source: 7.5' Farmington North

Physiography: ridge

Vegetation: pinyon, juniper chaparral

Site Description: The site is a small trash scatter. Artifacts noted include: hole-in-top cans, dinnerware fragments, pocket-style tobacco tins, purpled bottle glass fragments, and car battery parts.

Artifact Analyses: All of the collected glass and a canning jar lid are datable. A bottle fragment with the "SQUIBB" mark dates from 1858-1895 (Toulouse 1972: 481). The base of a canning jar embossed with the "KERR" Maker's mark, and Chicago, Illinois, for the plant location, provide a date of 1909-1912 (Toulouse 1972: 306). A portion of a canning jar with part of the embossed label "SELF SEALING" dates the container to post-1915 (Toulouse 1972: 306-307). The tobacco tin was made after 1913 (Music 1971: 54). Also collected was a "LIPTON TEA" can (no date). Several fragments of purpled glass were also observed. Purpled glass dates from 1880-1925 (Newman 1970: 70-75).

Date Range: 1915-1925

LA 33732 (FA 2-4)

Elevation: 5860 feet

Map Source: 7.5' Farmington North

Physiography: hillslope

Vegetation: pinyon, juniper chaparral

Site Description: The site was a drilling operation, consisting of a midden area, slag dump, depression and an embedded iron pipe casing capped with concrete. The concrete cap is inscribed with the following:

Phillips Healey

October 20, 1935

To the northwest are three concrete pilings known as "deadmen." These were used as weights to hold down the wooden drill rigs. The pilings are usually embedded in the ground to provide stability to the superstructure. (Donald J. Alexander, Mining Engineer, Regional Office, USDA Forest Service, personal communication, 1981).

Artifact Analyses: Artifacts include: dinnerware sherds, bottle and window glass fragments, evaporated milk cans, pocket-style tobacco tins, and drilling materials such as casings, metal cable, and wood.

Date Range: 1935, based on the inscribed drill cap.

LA 33733 (FA 2-5)

Elevation: 5890 feet

Map Source: 7.5' Farmington North

Physiography: hillslope

Vegetation: pinyon, juniper chaparral

Site Description: This is a probable one-time trash scatter, consisting of household refuse.

Artifact Analyses: Tin cans, evaporated milk cans, post-1913 pocket-style tobacco tins, several styles of pressed glass dinnerware fragments, and purpled bottle glass fragments comprise the collection.

Date Range: 1913-1940s, based on tobacco tins (Music 1971: 54) and the pressed glass fragments.

LA 33744 (FA 2-16)

Elevation: 5550 feet

Map Source: 7.5' Horn Canyon

Physiography: cliff

Vegetation: juniper, grasslands

Site Description: This is a multi-component petroglyph site and a modified rock shelter. The prehistoric and historic petroglyphs include: human figures; masked human figures; animals; foot and handprints; dates of 1979 and 1981; and the following phrases "hang all human spies they are dangerous" and "Little Jack Horner sat in the corner eating Christmas pie." Some of the petroglyphs have been defaced by bullets. A firepit was once built inside the rock shelter, and recent trash and automobile tracks were noted at the time of survey. No artifacts were collected.

Date Range: Prehistoric to 1981.

LA 33748 (FA 3-1)

Elevation: 5970 feet

Map Source: 7.5' Farmington North

Physiography: erosional slope

Vegetation: pinyon, juniper

Site Description: The probable hogan is evidenced by a depression and forked stick. A midden is located southeast of the depression. Midden artifacts recorded by the survey crew include: tin cans, bottle glass fragments, green depressionware milk glass fragments, stoneware, china and porcelain sherds, an enamelware metal bowl, a graniteware basin, a stove pipe section, bailing wire, sheet metal, nails, and car parts.

Artifact Analyses: Collected and analyzed artifacts include: a purpled bottle glass fragment dated 1880-1925 (Newman 1970: 70-75); one 1929-1954 bottle base fragment of the Owens-Illinois Glass Co. (Toulouse 1972: 403); a post-1913 pocket-style tobacco tin (Music 1971: 54); a "KC BAKING POWDER" tin dated 1890-1925 (Ward et al. 1977: 240); a "CALUMENT BAKING POWDER" can (no date); a "LIPTON TEA" can (no date), a fragment of white ware (no date); and a tin "Cracker Jack" token which could not be dated.

Date Range: 1900-1950s

LA 33749 (FA 3-2)

Elevation: 5900 feet

Map Source: 7.5' Farmington North

Physiography: erosional slope

Vegetation: native grasses, juniper

Site Description: The site consists of a small trash scatter containing several paint cans, five galvanized metal wash tubs, and an enamel bucket. The trash scatter is located northwest of a hogan (FA 3-1), and may be directly associated with it. No artifacts were collected.

Date Range: Not known.

LA 33757 (FA 4-4, Bloomfield IV)

Elevation: 5700 feet

Map Source: 15' Bloomfield

Physiography: ridge

Vegetation: desert scrub

Site Description: The historic component of this multi-component site consists of a probable outhouse and a trash scatter. The survey crew suggested that the site was used as a sheepherding camp. No historic artifacts were recorded or collected.

Date Range: Not known.

LA (FA 4-5, Bloomfield V)

Elevation: 5640 feet

Map Source: 15' Bloomfield

Physiography: saddle

Vegetation: pinyon, juniper

Site Description: The area immediately north of Bloomfield Elementary School was used extensively for refuse disposal. The trash has scatterred over a large area but fourteen distinct concentrations were mapped. No artifacts were mapped in place. Several of the concentrations were burned. No artifacts were collected; however, a list of artifacts was made. A variety of items is listed below:

License plates: Colorado 1953 (2);

Missouri 1951 (1);

New Mexico 1938 (1), 1946 (1), 1950 (1), 1951 (1), 1952 (5), 1954 (3), 1955 (1), 1956 (4), 1958 (1), 1959 (3).

Bottles: Fruit bowl (soda bottle) ca. 1938 (Ward et al. 1977); O-So (soda bottle); Coke bottle from Albuquerque, New Mexico plant; Coke bottle from Durango, Colorado plant; Coke bottle from Gallup, New Mexico plant.

Other bottles: beer, ketchup, clorox, whiskey, milk, syrup.

Cans: spam, beer, coffee, sardines, paint, spice, oil, tooth powder.

Car parts: headlights, seat, springs, gaskets, 1951 Studebaker body.

Miscellaneous: boots, ironing board, hot water heater, tool parts, dinnerware fragments, insulator, wash tub, broken toilet, bed springs.

Many other items were also listed.

Date Range: late 1930s-1960s

LA 33759 (FA 6-2, Foothills II)

Elevation: 5840 feet

Map Source: 7.5' Farmington North

Physiography: hillslope

Vegetation pinyon, juniper, native grasses

Site Description: The site consists of a 15 by 12 foot one-room structure, constructed of unshaped cobbles standing five courses high with a clay mortar. The doorway faces an access road which runs northwest-southeast on the west side of the building. Tin roofing material was observed to the south and a small hole was noted in one corner. A partially burned midden is located north of the structure; however, the survey crew suggested that the artifacts are more recent than the structure (no reason given). Very few artifacts were observed in direct association with the structure. The site form notes that the survey crew collected metal artifacts but these were not found during the analysis phase.

Date Range: Not known

LA 33760 (FA 6-3, Foothills III)

Elevation: 5760 feet

Map Source: 7.5' Farmington North

Physiography: erosional slope

Vegetation: pinyon, juniper

Site Description: This site was also called the "Boy Scout Camp." There are at least four campfire rock rings with juniper branches stacked next to each hearth. None of the hearths shows evidence of use. Other rock alignments appear to be pathways and tent outlines. The only artifacts noted were a tin can and a metal "D" ring.

Date Range: 1975-1981 based on the undisturbed condition of the site.

LA (FA 6-5, Foothills V)

Elevation: Not known

Map Source: 7.5' Farmington North

Physiography: ridge

Vegetation: pinyon, juniper

Site Description: This is a multi-component site; the rock shelter may have been utilized during prehistoric and recent historic periods. A recent hearth was noted ca. 10 ft. west of the rock shelter. No historic artifacts were recorded.

Date Range: Not known

Farmington Isolated Finds

FA IF 1-7

Map Source: 7.5' Kirtland

Description: A 1936 New Mexico automobile license plate, probably associated with a nearby, abandoned road (FA 1-8).

Date Range: ca. 1936

FA IF 1-9

Map Source: 7.5' Farmington South

Description: The isolated find form for FA IF 1-9 states that four bottles were collected from a small trash scatter; however, only one bottle was found in the collection bag at the time of artifact analysis. This bottle is a 4 oz. medicine bottle that does not have a maker's mark. There is a patent number 0-95849 on the base of the bottle.

Date Range: Not known

FA IF 1-13

Map Source: 7.5' Horn Canyon

Description: One fragment of purpled bottle glass and one fragment of bone were collected. The bone fragment was too small to identify the species.

Date Range: 1880-1925 (Newman 1970: 70-75)

FA IF 3-9

Map Source: 7.5' Farmington North

Description: The isolated find form indicates that this is a small trash scatter consisting of a lawn mower, a car body, heavy machinery parts, and a pressure tank. No artifacts were collected.

Date Range: The survey crew suggested that the scatter dates to the 1940s-1950s.

FA IF 6-47

Map Source: 7.5' Flora Vista

Description: Recorded but uncollected items from this ca. 25 ft. diameter trash scatter include a "RADIANT ROAST" coffee can, a "PAKE'S BAKING POWDER" can, sardine tins, an aspirin tin, post-1913 pocket-style tobacco tins, (Music 1971: 54), hole-in-top and sanitary style food cans, a bucket re-utilized as a sieve, dinnerware sherds, canning jar lids, and a battery (type unknown).

Artifact Analyses: Collected artifacts include: several pre-1925 purpled glass bottle fragments (Newman 1970: 70-75) and a bottle base dated 1929-1954 based on the "Owens-Illinois Co." maker's mark (Toulouse 1972: 403); 1927 and 1934 New Mexico license plates; a "WATKIN'S DESSERT" can lid; and a "DR. PRICE'S PHOSPHATE BAKING POWDER" can.

Date Range: Late 1920s-early 1950s

FA IF 6-49

Map Source: 7.5' Farmington North

Description: This is a cobble that has "55" pecked onto it.

Date Range: Not known

FA IF 7-8

Map Source: 7.5' Flora Vista

Description: This is a rock-lined hearth with pieces of charcoal within the hearth. Also recorded are six large rocks arranged in a circle, approximately 100 feet away from the hearth. No artifacts were noted.

Date Range: Not known

FA IF 7-9

Map Source: 7.5' Flora Vista

Description: This isolated find includes a sheep corral and a trash scatter. The corral has four standing posts with barbed wire still attached. At least ten posts have been pulled up. Two juniper trees were incorporated to complete the corral's ca. 30 foot diameter. Several boards were attached to the west corner post with wire nails. The trash dump includes a "FRENCH'S" mustard jar, food cans, and a coffee can. There is an unusually high number and diverse assortment of medicine and cosmetic containers. These include a "POND'S" hand cream jar, an "ALKA SELTZER" bottle, a rouge ceramic jar, several ear drop bottles, and a "PHILLIPS MILK OF MAGNESIA" bottle. An aerosol can (product unknown) and a car coil complete the assemblage. No artifacts were collected.

Date Range: 1950s

Farmington Historic Sites—Conclusions

The historic sites that were recorded by the Elena Gallegos-Farmington survey have been assigned to the first half of the twentieth century, when the Farmington area was experiencing its first energy boom. Six of these historic sites are trash dumps, and several of these consist almost entirely of food and beverage containers and container fragments. It is suggested that these high concentrations of containers were generated by the semi-transient peoples who worked at the energy-related jobs in the vicinity of the surveyed areas.

Two such dump sites are LA 33729 and LA 33731; their trash contents are limited to food cans, beverage, and medicine bottle fragments, as well as numerous pocket-style tobacco tins. Similar artifact concentrations are present at LA 33730 and LA 33732, which are early twentieth century gas or oil well locations. Well sites are occupied during the drilling phase of operation. Such workers to this day leave essentially the same type of trash as those who first worked Farmington's gas and oil fields, i.e., food and beverage containers.

The juxtaposition of the Farmington area with the Navajo reservation resulted in constant contact between the Navajos and Euro-Americans since 1876, when Farmington was first settled. However, the Navajo people appear to have maintained their basic cultural pattern until the mid 1930s and early 1940s, when federal stock-reduction programs and irrigation farming were introduced. The CGP survey of the Lower Chaco River Valley (Ward et al. 1977) has adequately documented the increased Navajo dependency on Euro-American goods, indicated by the larger quantity and diversity of Euro-American refuse found in each succeeding horizon. This process of acculturation speeded up during the period of major economic growth in the Farmington area, with more Navajos obtaining a steady cash income by working in the fossil fuel industry. The two Navajo sites recorded during the Elena Gallegos-Farmington survey (LA 33748 and LA 33749) reflect these processes of Navajo acculturation; both sites contain the remains of a traditional hogan in association with Euro-American refuse.

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Chapter 21 • Synthesis of the Prehistoric Occupation and Evaluation of the Research Design

Carol Raish

Overview of Prehistoric Chronology and Research

Research Design Review

In order to view the prehistoric sites of the Elena Gallegos Land Exchange in proper perspective, they must be placed within the context of a larger region. This larger region encompasses the northern San Juan Basin with a special focus on a section of its northern periphery, the mesas and uplands immediately north of the San Juan River in the vicinity of Farmington, New Mexico. This discussion briefly reviews the three major prehistoric periods present in the general area: the PaleoIndian, Archaic, and Anasazi periods. It then reviews the occurrence of prehistoric remains from these time periods on the project lands and in adjacent areas. Finally, it examines the identified archeological sites in terms of their ability to contribute information to the research questions developed throughout the project.

PaleoIndian

PaleoIndian remains are the earliest documented cultural materials in the San Juan Basin. No PaleoIndian sites were identified on the project lands, and they are rare in the northern San Juan and its periphery. Archeological surveys on Crouch Mesa east of Farmington between the Animas and San Juan rivers identified no PaleoIndian remains (Moore et al. 1987; Watson 1983), nor were any PaleoIndian sites or artifacts found during work on Hood Mesa, north of Farmington (Burns 1988). Various survey projects have not located remains from this period in the La Plata Valley (Dykeman and Langenfeld 1987; Lancaster 1982), or in the vicinity of Shumway and Westwater arroyos (Powers et al. 1980) to the west of Farmington. However, two PaleoIndian sites, one camp site and one chipping scatter, were reported in the vicinity of Dain Arroyo, also to the west of Farmington (Broilo 1974; Chapman and Biella 1979:11).

Based on current information, PaleoIndian materials seem to be more prevalent south of the San Juan River. Though no sites or artifacts from this time period were located on the Bolack Exchange lands immediately south of the San Juan (Hogan 1986:5), PaleoIndian isolated artifacts and site components were identified on the Navajo Indian Irrigation Project (NIIP), which covers an extensive amount of land south of the river (Gilpin et al. 1984). Though these types of remains are absent from the Elena Gallegos Project lands and very scarce in the adjacent areas, it should not be assumed that the area was not occupied in PaleoIndian times. As Dykeman and Langenfeld discuss (1987:15), deeply buried sites and an absence of diagnostic artifacts are undoubtedly contributing to a low discovery rate for these sites, which contributes to our perception of scarcity.

Hogan presents a general overview of the PaleoIndian period in the Southwest, with an emphasis on the San Juan Basin. He supports Judge's (1982:48-49) argument that the PaleoIndian subsistence strategy is best viewed as a "focal" economy in which the primary food sources were a limited variety of megafauna supplemented by plant foods and small mammals. As far as Clovis hunters are concerned, Judge suggests that they may have been primarily scavengers of mammoths and hunters of bison and other species, as discussed by Cordell (1979:20) and Hogan (1986:5). Later groups apparently focused on bison procurement (Cordell 1979:21; Hogan 1986:5-6). With this subsistence strategy, the location of habitation sites would have been primarily dependent upon the location and number of large mammals, which suggests a high degree of residential mobility (Judge 1982:49).

According to Hogan (1986:3), diagnostic projectile points found during surveys in the Basin suggest that the PaleoIndian occupation of the area includes the full time range defined for the Great Plains from 12,000-7,500 B.P. (ca. 10,000-5,500 B.C.). This time range includes the Clovis, Folsom, Plano, and Cody complexes. However, too few sites have been recorded to permit any discussion of particular PaleoIndian adaptations and settlement patterns in the northern San Juan Basin (Hogan 1986:3). Owing to the absence of PaleoIndian cultural remains from the Elena Gallegos Project lands, no research questions were developed for this period and no further discussion of PaleoIndian times is presented.

Archaic

Cultural-Temporal Framework

The most commonly used cultural-temporal framework for the Archaic in the San Juan Basin is the Oshara Tradition as defined by Irwin-Williams (1973) in the Arroyo Cuervo region, between the Rio Puerco of the East and the Jemez River. Though this area lies at the southeastern edge of the Basin, her chronological framework is nonetheless considered useful for the San Juan Basin and its northern periphery. Modifications and adaptations of the original settlement-subsistence model are an ongoing process. Some of these are discussed in the following sections.

Irwin-Williams' research was designed to study the origins of Anasazi culture using survey and excavation of Archaic sites in the Arroyo Cuervo region. She proposed an early Picosa culture composed of four interacting traditions for the Southwestern Archaic, with the Oshara as its northern tradition (Cordell 1984:158; Irwin-Williams 1973). The Oshara Tradition is composed of the following six phases.

Jay phase	ca. 5500 B.C. - 4800 B.C.
Bajada phase	ca. 4800 B.C. - 3200 B.C.
San Jose phase	ca. 3000 B.C. - 1800 B.C.
Armijo phase	ca. 1800 B.C. - 800 B.C.
En Medio phase	ca. 800 B.C. - A.D. 400 (BMII)
Trujillo phase	ca. A.D. 400 - A.D. 600

Irwin-Williams saw the Jay phase as beginning the Archaic with an influx of new populations whose closest cultural affiliation was to the west, around 5500 B.C. She stated that the Cody Complex was the last PaleoIndian manifestation in the northern Southwest, and that PaleoIndian peoples moved north and east onto the Plains around 6000 B.C., creating a hiatus in occupation between the PaleoIndian and the Archaic (Cordell 1984:158; Irwin-Williams 1973). According to Irwin-Williams, the environment of northwestern New Mexico could no longer support large herds of bison by this time, and the PaleoIndian groups abandoned the area following the herds.

Other researchers do not support this view of a hiatus in occupation, however. As discussed by Cordell (1984:157-158) and Hogan (1986:7), Judge (1982:49) contends that the Jay and Bajada phases constitute a PaleoIndian focal-hunting adaptation to essentially modern fauna and vegetation. This argument implies that the early Archaic assemblages in northwestern New Mexico do not represent the entrance of a new population into the area, but adaptation by resident PaleoIndian groups to a changing resource base (Cordell 1979). Stuart and Gauthier (1981:32-33) also favor an adaptation to changing resources by local PaleoIndian groups but seem to envision a more broad-spectrum economy from the early Archaic on. Judge describes the (later) Archaic economy as a diffuse (as opposed to focal) economy in which a variety of plant and animal resources were exploited. Given this resource exploitation pattern, the Archaic settlement pattern should show maximum reoccupation in areas where the distribution and density of important plant resources could be predicted on a seasonal basis. As stated by Hogan (1986:7), current settlement-subsistence models assume that the Archaic peoples of northwestern New Mexico possessed many of the basic characteristics of modern hunting and gathering groups in arid environments - a primary dependence on plant food resources, a seasonally mobile settlement pattern, and a flexible social structure with group size varying in response to changing economic opportunities.

A brief review of the phases of the Oshara Tradition is presented here. These apparently represent responses to both changing environmental conditions and to population growth, culminating in the appearance of the Anasazi Tradition.

Jay Phase (ca. 5500 B.C. - 4800 B.C.)

Jay phase sites are located in sheet sand deposits at canyon heads on the cliff tops, near intermittent ponds, and at the base of the low mesa in the Arroyo Cuervo region. Canyon-head sites are small but clustered, suggesting reoccupation. Projectile points are large, slightly shouldered points; other artifacts include lanceolate bifacial knives, and side scrapers. No groundstone is present on Jay sites from the Arroyo Cuervo region (Irwin-Williams 1973:4-5; Kirkpatrick 1980:1531), but groundstone, in the form of one-hand cobble manos and thin, slab metates, has been found on excavated sites from the Navajo Indian Irrigation Project lands within the San Juan Basin (Hogan 1986:8). Jay phase sites are interpreted as indicating mixed subsistence activities adapted to year-round exploitation of local resources, from base camps near permanent water sources at canyon heads (Irwin-Williams 1973:4-5).

Bajada Phase (ca. 4800 B.C. - 3200 B.C.)

Bajada phase sites are located in the same general pattern as those of the Jay phase. The site size and the location of sites at canyon heads demonstrates that repeated visits or reoccupations were still a pattern of the settlement system. Small hearths and earth ovens are identified during this phase. Smaller projectile points with well-defined shoulders, side scrapers, and an increase in large chopping tools characterize this period. In the Arroyo Cuervo, the number of sites increases during Bajada phase times suggesting an increased population which continued to exploit a wide variety of resources (Irwin-Williams 1973:6-7). However, as Kirkpatrick states (1980:1531), the increase in sites might also reflect a small but more mobile population adapting to drier conditions by exploiting more plant and animal resource areas.

San Jose Phase (ca. 3000 B.C. - 1800 B.C.)

San Jose phase sites are still located at canyon heads or canyon rims, and in canyon bottoms near water. Several specialized hunting camps are also known from this period. San Jose sites are larger and more numerous than the sites of preceeding phases, with evidence of middens and temporary structures in the form of irregular posthole patterns. Large cobble-filled hearths and earth ovens are more common during this phase. In the Arroyo Cuervo, cobble manos and shallow basin grinding slabs appear for the first time, and large chopping tools and crude side scrapers increase in numbers. Projectile point form remains essentially the same, but serration often occurs along the blade, there is a shorter stem-to-blade ratio, and there is an emphasis on expanded stems. These changes in features and artifacts are interpreted as indicating a broad and varied subsistence base with an increasing emphasis on the use of plant resources (Hogan 1986:9; Irwin-Williams 1973:7-9; Kirkpatrick 1980:1531).

Armijo Phase (ca. 1800 B.C. - 800 B.C.)

Sites of the Armijo phase are located in areas similar to those of the Jay phase, with a continued emphasis on canyon-head locations. Armijo sites are larger than sites of the earlier phases, however, and rockshelters now appear as a site type. Sites include irregular posthole patterns, large concentrations of fire-cracked rock, and evidence of patterned activity or work areas. A wider variety of tools, and an increase in the number of groundstone tools, mark the artifact assemblages from these sites. The projectile point form changed to concave and straight-base points, with shallow corner notching or narrow stems (Irwin-Williams 1973:9-11; Kirkpatrick 1980:1531-1532). The Armijo phase saw a major change in subsistence adaptation, with the adoption of limited maize cultivation, which is seen as providing a relatively reliable, though localized, seasonal surplus. This seasonal surplus might have allowed seasonal aggregations of some 30-50 people, resulting in the increased site size during the phase (Hogan 1986:9-10; Irwin-Williams 1973:9-11).

En Medio Phase-Basketmaker II (ca. 800 B.C. - A.D. 400)

The En Medio phase is the final phase discussed under the Archaic period, since the Trujillo phase is considered to be early Basketmaker III and, thus, is discussed as a part of the Anasazi Tradition. This continuation of phases suggests <u>in situ</u> development of the Anasazi Tradition out of the Archaic in northwestern New Mexico, as proposed by Irwin-Williams (1973:11).

The following summary of En Medio-BMII is taken from a discussion by Hogan (1986:11-13) of Irwin-Williams' views on the development of the phase in the Arroyo Cuervo region (1973:11-15). Canyon-head rockshelters and cliff-top sites remain the favored locations, with a sharp increase in the number of sites during this phase. This continued increase in the number of sites is viewed as resulting from regional population growth. Sites show continued seasonal reoccupations, and numerous well-made storage pits are present for the first time. Artifacts include deep basin and troughed grinding slabs, with both cobble and long, flat manos. The point forms show stemmed corner notching and an increasing use of long barbs (Irwin-Williams 1973:11-15).

A change in settlement pattern occurred during this time period, with the occupation of a previously unused micro-habitat. This new pattern includes seasonal occupation of the extensive dune ridges in the southeastern portion of the Arroyo Cuervo area. These sites usually include shallow storage pits, fire-cracked cobble concentrations, hearths, patterned work areas, and possible indications of simple shelters. These sites are believed to have served as temporary camps occupied sometime between late spring and early fall to exploit the plant resources of the dunes. Isolated hunting and gathering locations in a variety of other habitats surrounding the base camps also continued to be used. This settlement pattern indicates a broadening of the resource base and the development of a strongly seasonal annual cycle, possibly in response to growing population pressure.

The Archaic in the Northern San Juan Basin and Its Northern Periphery

Archaic sites are well documented from south of the San Juan River in the northern San Juan Basin. Archeological projects undertaken for the Coal Gasification Project (CGP; Reher 1977), the Navajo Indian Irrigation Project (NIIP; Allan 1975; del Bene and Ford 1982; Gilpin et al. 1984; Kirkpatrick 1980; Vogler 1983), the Navajo Mine Archeological Program (NMAP; Hogan and Winter 1983), and the Bolack Land Exchange (Acklen and Greiser 1977; Hogan 1986) have contributed greatly to our knowledge of Archaic sites, subsistence, and settlement patterns in the Basin. Sites and components from the Jay, Bajada, San Jose, Armijo, and En Medio-BMII phases are present in the northern San Juan. Information from the areas examined for the NIIP project indicates that Jay phase sites seem to be located within a few kilometers of major drainages and are larger than the sites identified by Irwin-Williams, with some containing evidence of substantial occupation (Gilpin et al. 1984:49; Hogan 1986:8). These sites are seen as base camps. As discussed by Gilpin et al. (1984:49), the groundstone present on these sites, and the bone from medium-sized animals that is also present, suggest that a well-developed Archaic hunting and gathering lifeway existed even during the earliest phases of the Archaic. Bajada phase sites are also located along drainages and contain the same types of artifacts and features that are found on the Jay phase sites. However, the Bajada phase seems to be more often represented by satellite sites (temporary camps) and isolated hearths (Gilpin et al. 1984:50). Nonetheless, these sites and assemblages seem to indicate a continuation of the same range of activities as noted during the Jay phase (Hogan 1986:8-9).

San Jose phase sites are the most numerous Archaic sites in the NIIP areas, and tend to cluster along drainages and near playas where water would have been present (Gilpin et al. 1984:50; Hogan 1986:9). As discussed by Hogan (1986:9), San Jose phase sites, as is the case for all the Archaic sites, are seen as clustering in a series of base camps in close proximity to water sources (Vogler et al. 1982). According to this interpretation, the base camps served as residential and processing centers with which a number of satellite sites were associated. Resource procurement and most of the processing occurred at the satellite sites. Procurement of vegetal resources and lithic materials are the most common activities conducted at the satellite sites.

Fewer Armijo components are located in the NIIP blocks than San Jose components, though there seem to be more Armijo components in the easternmost blocks than San Jose components. Hogan (1985, 1986) sees this as a demographic shift rather than a time of decreased occupational intensity. Irwin-Williams (1973:9-11) saw limited maize agriculture as a part of the Armijo subsistence system. Evidence for maize use in the NIIP study areas is very scarce and is limited to pollen evidence from a possibly disturbed context (Gilpin et al. 1984:51). However, on the Alamito Coal Lease near Chaco Canyon evidence for the use of corn was obtained from two sites which were dated between 2035 B.C. and 1610 B.C. (Gilpin et al. 1984:51; Simmons 1981). Thus, evidence for the Late Archaic cultivation of maize is present in the area.

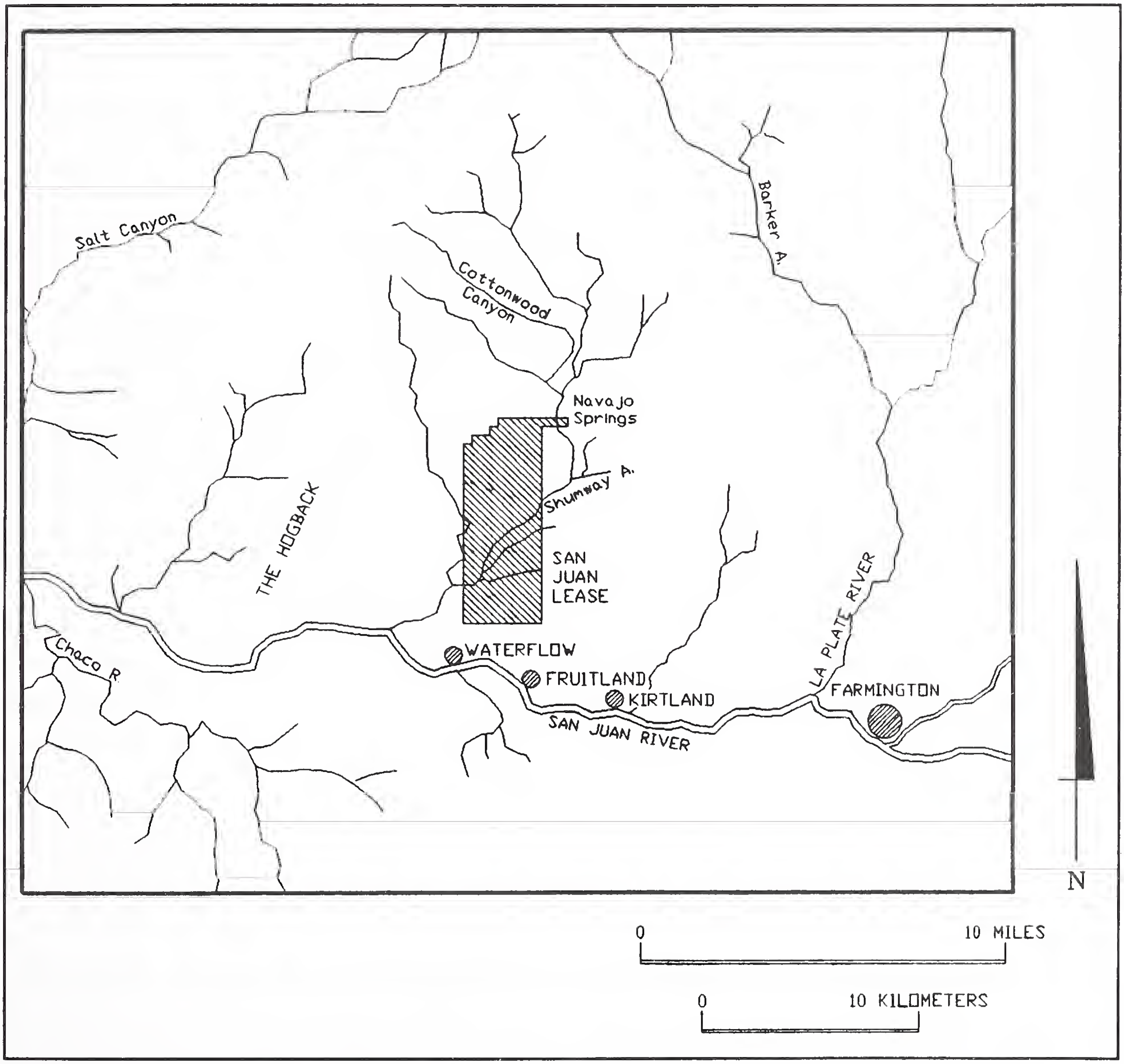
En Medio-BMII sites on the NIIP lands were initially separated into En Medio and BMII groupings on the basis of projectile point form and settlement location, and were suggested by Vogler et al. (1982) to represent two distinct groups using the area (Hogan 1986:11-12). Later excavations showed that those sites designated as BMII contained pitstructures (Gilpin et al. 1984:53), while those designated En Medio phase consisted of concentrations of chipped stone, groundstone, and fire-cracked cobbles. Both En Medio and BMII-style projectile points were found on three of the excavated sites, however, casting doubt on the suggestion that the area was occupied by two different groups during the period.

Hogan (1986:12-13) suggests that during this period the area was occupied by groups with a single cultural affinity but with two divergent settlement-subsistence systems. Owing to moister climatic conditions on the eastern periphery of the Basin, he argues that these groups may have been practicing limited cultivation, narrowing their home ranges due to scheduling conflicts, and adopting a strategy of logistical mobility. Groups to the west probably did not have any significant reliance on domesticated crops at this time and continued to practice the traditional pattern of seasonal mobility. Hogan is of the opinion that this dual occupancy continued at least until A.D. 350 to 650, and perhaps later. He envisions use of the area primarily as a resource zone exploited mainly between late spring and early fall. However, Hogan (personal communication, 1990) is currently in the process of revising his occupational model for this time period based on information indicating earlier and more widespread use of cultigens in the area.

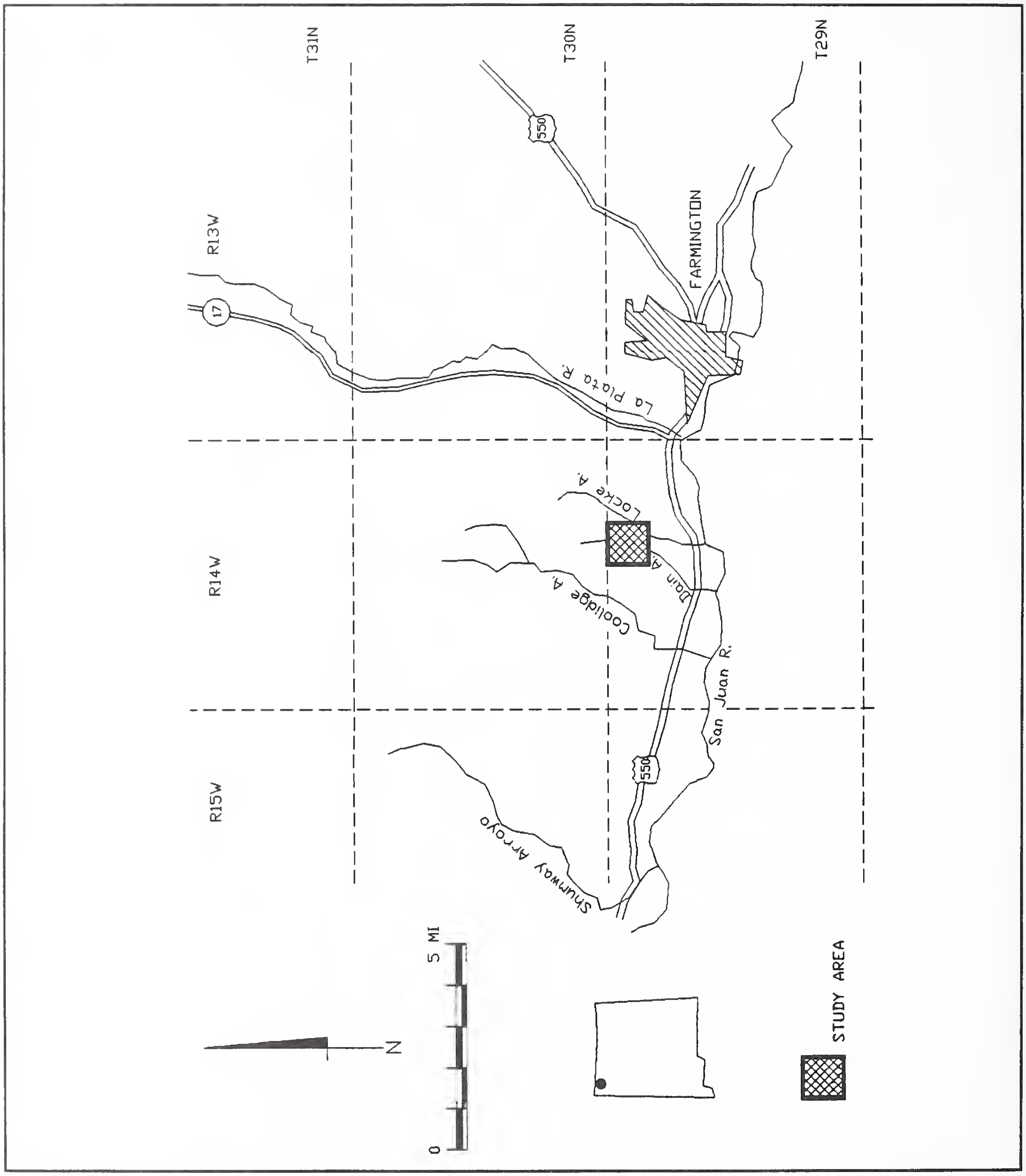
For his work with the Bolack Exchange Lands, Hogan (1986:36-41) obtained site data from the Museum of New Mexico, Laboratory of Anthropology's Archeological Records Management System (ARMS) on an area bounded on the north by the San Juan River, on the south by Hunter Wash, on the west by the Chaco River, and on the east by Kutz Canyon. In this region 505 Archaic sites and 27 BMII sites were recorded. The majority of the sites are closely associated with the major tributaries of the area suggesting that water was a critical factor in site location. In general, site density is highest in areas featuring the most reliable water sources. Second- and third-level site densities occur in immediate proximity to major drainages where subsurface water should be obtainable. Site densities are lowest in areas where small drainages or interdunal playas may have provided water during spring or summer (Hogan 1986:39). Basketmaker II sites cluster in the same areas that were apparently most intensively used by the earlier Archaic populations.

North of the San Juan River, in the vicinity of the Elena Gallegos lands, the picture is less clear, with fewer large-scale research projects to provide a data base. As recently as 1980, it was suggested that the San Juan River might have served as a sort of boundary for Archaic groups. It was argued that their presence north of the river would be constrained and limited by the availability of areas of high biotic diversity associated with aeolian areas, as suggested by Reher and Witter (1977) in the CGP study (Powers et al. 1980:9). The researchers felt that such areas were not as prevalent north of the river as south of the river. Low frequencies of Archaic sites were also suggested by the preliminary research for the La Plata River Valley study (Dykeman and Langenfeld 1987:15-16). Dykeman and Langenfeld state, however, that Archaic sites should not be assumed to be scarce simply because they are not well represented in previous work. Because of their age, these sites may be buried under sediments and thus not readily identifiable on survey. They also may lack diagnostic artifacts and thus be classified as "unknowns."

As more archeological work is undertaken in areas immediately north of the San Juan River, a better-defined Archaic presence in the area is becoming apparent. Survey conducted for the San Juan Mine Coal Lease on almost 7000 acres in the area of Shumway and Westwater arroyos, approximately 10 miles west and north of Farmington (Map 21-1), identified four sites attributable to the Archaic (Williams 1980:36-38). Three of these are affiliated with the San Jose phase, while the affiliation of the fourth site, a lithic reduction locus situated adjacent to an outcrop containing a vein of



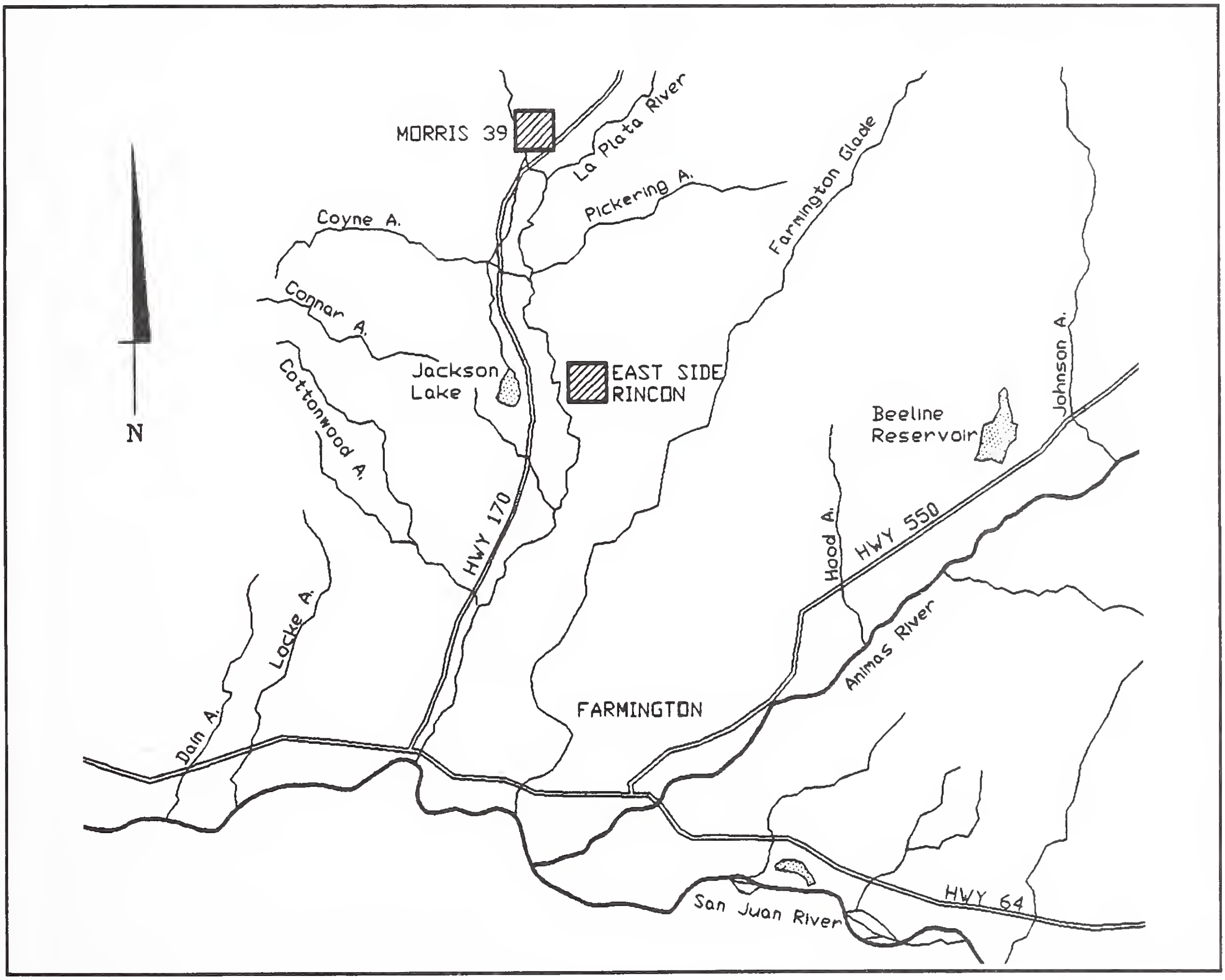
Map 21-1. The San Juan Mine Coal Lease Survey Area (after Powers et al., 1980:2).



Map 21-2. San Juan County Park Archeological Survey (after Chapman and Biella, 1979:10).

silicious material, is uncertain. No temporally diagnostic artifacts were found in association with this site. No BMII sites were located within the lease area. The initial research focus of the Archaic portion of this project was to test the applicability of Reher and Witter's (1977:113-126) vegetative diversity model. This was not done, however, owing to the scarcity of Archaic sites (Williams 1980:38).

East of Westwater and Shumway arroyos but still west of Farmington and the La Plata River, archeological survey was conducted on approximately 640 acres surrounding Dain Arroyo (Map 21-2) for the San Juan County Park (Chapman and Biella 1979). This survey documented 15 sites and 34 isolated occurrences. Eleven of the sites and 26 of the isolates were characterized solely by lithic artifacts, with no diagnostic artifacts identified (Chapman and Biella 1979:13,72). As stated by Chapman and Biella, such assemblages have traditionally been considered Archaic. There is considerable recognition now, however, that they may also be nonceramic Anasazi sites. With one exception, the sites represent either single or multiple episodes of lithic tool manufacture. The isolates are divided into those representing manufacturing activities and those representing isolated tools. Owing to an absence of hearths and an absence of spatial patterning in the distribution of artifact classes on the sites, in combination with a high proportion of cortical debris, these sites are considered to be special-use locations as opposed to residential



Map 21-3. Study Areas of the La Plata Valley Overview (after Dykeman and Langenfeld, 1987:34).

camp sites. They are generally distributed in open grassland settings and may have been the loci of expedient tool manufacture for harvesting and processing nearby food resources. However, they may also represent material acquisition and testing loci with some tool manufacture. One site (the exception) is a light lithic scatter with evidence of two slab-lined hearths. It is located near the eastern extremity of a large sand dune formation, and may represent a minimally used residential camp site (Chapman and Biella 1979:71-79).

Over the years, there has been considerable archeological work in the La Plata River valley. The history of this work is ably summarized by Dykeman and Langenfeld (1987) (Map 21-3). Though the vast majority of sites in the area are Pueblo II-III, Archaic and Basketmaker II sites are also known. Several researchers present evidence for occupation of the valley during these time periods. Approximately 3.5 km. (2.2 mi.) from the Colorado border lies the Ridge site, which is a multi-component site with a BMII occupation composed of shallow, dish-shaped pithouses (Foster 1983). In addition, there has been considerable archeological activity south of this area between the town of La Plata, New Mexico, and the Colorado border for coal lease and mining-related activities such as haul roads. Several Archaic sites were located during these surveys, although the great majority are Pueblo II-III occupations (Beal 1978a, 1978b, 1978c, 1978d, 1979; Seyfarth 1981, 1983a, 1983b, 1983c). The School of American Research conducted excavations on an extensive, multicomponent artifact scatter on one of the mine haul roads. The site consisted of a great many features, 23 of which were excavated. These included hearths, roasting pits, and informal pits. The site was apparently occupied from the Archaic-BMII through the PII periods. According to Scheick (1983:90), the Archaic-BMII occupation was a single episode which involved the harvesting and initial processing of corn (Dykeman and Langenfeld 1987:14). More recently, other Archaic sites, which appear to be composites of small activity areas, have been tested and excavated on the mine lease. Shallow pitstructures have been found on sites of late Archaic age, ca. 700 - 300 B.C. (Reed 1985; Reed and Hancock 1985a, 1985b).

To the east of the La Plata Valley immediately north of Farmington, 20 acres on Hood mesa were surveyed for the Anasazi Pageant Amphitheatre project (Burns 1988). This survey area is bordered on the north and west by lands surveyed for the Elena Gallegos Land Exchange. During the amphitheatre project, five sites were located, four of which are lithic scatters of unknown age. These could be either Archaic or Anasazi or both. One of the lithic and groundstone scatters also contained a hoe, so agriculture can be inferred as at least one of the activities occurring on the site. The fifth site is a rockshelter utilized during Anasazi times.

These lands on Hood Mesa between the La Plata and Animas rivers north of Farmington fall within Geographic Group III of the Elena Gallegos Project Farmington-area lands (Map 19-1 and Table 19-11). (The use of the ceramic Geographic Groups from Chapter 19 in the present chapter is explained below.) During the various phases of the project, five middle to late Archaic sites and components were identified. These fall basically into the San Jose and Armijo phases. Three BMII sites and components were also located (Bertram, this volume and Schutt, this volume). These sites, their functions, and their geographic locations are discussed in greater detail in following sections of this summary.

South and east of the Animas River, north of the San Juan River, and east of Farmington (see Map 19-1, Geographic Group II), archeological work has been conducted on Crouch Mesa for the 6.2-mile Crouch Mesa County Road (Watson 1983), and for a 160-acre landfill (Moore et al. 1987). Survey for the road identified nine Anasazi sites and one site of unknown age consisting of an ash stain, charcoal, possible burned rock, a tested basalt cobble, and a chert flake. The landfill study located 15 sites of which seven are purely Anasazi. The remaining eight can be broken down in the following manner. One site is considered to be a special activity hunting locus during BMII-III times. This site also has a PII-PIII component. The other datable site is considered to be a probable Archaic temporary camp. Six other sites are lithic, fire-cracked rock, and groundstone scatters of undetermined age.

The Crouch Mesa area is located within the rough Geographic Group II of the Elena Gallegos lands (Map 19-1 and Table 19-11). During the land exchange project, one site with both an early and a late Archaic component was identified, as well as four "unknowns." These sites, their functions, and their geographic locations are examined in greater detail in following sections.

As can be seen from this brief review, Archaic sites and components are not as prevalent north of the San Juan as they are south of the river. Some of this difference undoubtedly relates to the larger blocks of land that have been studied south of the river. Some may also relate to differing environmental settings, such as fewer dunal areas, and to changing patterns of land use.

Settlement-Subsistence Models and Research Questions

The Archaic

In his research design for the Bolack Exchange Lands, Hogan presents a review of the recent settlement-subsistence models and the primary research questions that have been developed for the Archaic of the northern San Juan Basin (1986:49-60). Two key themes of the reviewed studies focus on defining site types and predicting site locations. These themes begin with Reher and Witter's (1977) vegetative diversity model, which predicts that site density and frequency will be highest in areas of highest vegetative diversity, and their definitions of base camps, camp sites (temporary camps), and special-use sites. These themes continue with Vogler's (1983) addition of water as a critical resource conditioning site location and his statement that Archaic sites are most commonly situated near water and in areas of high vegetative diversity. With continuing research, water has emerged as the most critical factor conditioning both site location and vegetative diversity. As site types, Vogler defines base camps, and satellite sites (temporary camps). But, like Reher and Witter, he found that the two types of sites form a continuum making a clear-cut distinction between the two difficult. Larger sites with larger artifact assemblages tend to be interpreted as base camps, while smaller sites are interpreted as satellite sites. The possibility that the larger sites were produced by periods of reoccupation is often ignored.

In an attempt to resolve the problem of distinguishing between base camps and satellite sites, Vierra undertook further work on the settlement and subsistence of the northern San Juan Basin (1980:351-357). Vierra's model suggests that the Archaic hunter-gatherer settlement system is composed of a base camp surrounded by a foraging area within which task-specific sites are located. Task-specific sites evidence a restricted range of activities associated with procurement of floral, faunal, and non-food resources. They leave few material traces and have low visibility in the archeological record. Vierra defines two types of base camps. They are limited base camps occupied by microbands, which are the primary foraging and residential unit, and home base camps occupied by a macroband, which is an aggregation of related microbands. Thus, home base camps are equivalent to base camps, and limited base camps are equivalent to satellite sites or temporary camps. Vierra further states that all the Archaic sites in the CGP area are limited base camps with size variations resulting from the length and number of occupations. A re-evaluation of about half the larger Archaic sites recorded during the CGP study indicated that they were apparently reoccupied limited base camps.

Further excavations in the CGP study area were conducted as part of the NMAP project (Hogan and Winter 1983). The goals of this project were to evaluate Vierra's arguments and to develop a regional model of the Archaic settlement-subsistence system. The developed model is a valuable one that has considerable potential for assisting in understanding the Archaic of the northern San Juan Basin. In the following discussions, the Farmington data are examined in terms of this model. In developing the model, Elyea and Hogan (1983:393-402) suggest that Archaic groups in the area were primarily dependent on a relatively small number of seasonal resources, as opposed to the broad-spectrum exploitation pattern of the vegetative diversity model. Given the evidence for the preponderance of short-term microband camps in the San Juan, they argue that the Archaic settlement-subsistence system in the region is best characterized as a serial foraging strategy.

This type of strategy is described by Elyea and Hogan in the following manner (1983:393-402). The model suggests that the Archaic hunter-gatherers were usually split into small residential groups - at least from early spring to late fall. During this time the groups moved periodically to position themselves to exploit seasonally-available plant resources. In the CGP and NIIP areas water was the critical resource affecting camp location. This would result in a "tethered" settlement pattern with repeated occupations of camp sites in close proximity to water. Camp sites would also be located in close proximity to the targeted resources. This type of strategy implies that groups maintained an information network to aid them in determining when and where seasonal resources are most abundant. Seasonal aggregation into macrobands may have been important in this type of network, but these sites would be relatively rare.

Using information on plant resource locations from a study by Toll and Cully (1983), Elyea and Hogan (1983:393-402) suggest that the CGP and NIIP areas were part of a lowland occupation from early spring through early fall. They suggest that the most likely areas for late fall and winter occupation were either the pinyon-juniper uplands along the periphery of the Basin or the San Juan River Valley.

As mentioned previously, this subsistence strategy is described as serial foraging. Another mobility strategy suggested for the area is that of "central-based collecting." This model suggests that seasonal macroband base camps were established near water and in close proximity to areas of high vegetative diversity. As targeted resources became seasonally available, they were procured and processed from satellite sites established in the area of the targeted resource surrounding the base camp. Resources were then brought back to the base camp, where they were consumed.

The decision as to which model best describes the Archaic adaptation of the northern San Juan Basin hinges on understanding the larger Archaic sites of the area. Do they represent macroband base camps or microband camps with multiple reoccupations? Is the resource base narrow or broad spectrum? The Archaic sites identified during the Elena Gallegos Land Exchange Project are examined in terms of their potential to contribute information concerning which type of mobility strategy, serial foraging or central-based collecting, was in operation north of the San Juan River. An attempt is made to determine if the sites represent limited base camps, home base camps, or special activity areas. Season of use and exploited resources are also examined, where possible, to explore the possibility that the upland sites might form the late fall-winter portion of the seasonal round described for groups south of the San Juan. Finally, the information from the Archaic sites north of the river is used to answer certain questions discussed in the project research designs (Elliott, this volume and Raish, this volume). These include refining the local Archaic chronology, obtaining a better understanding of major plant and animal resources, and learning when cultigens came into use in the area. In our lithic analysis, we were not able to address another research question: the differentiation of Archaic and Anasazi sites with no diagnostic artifacts on the basis of patterns in lithic material type selection and lithic technology. Thus this topic is not pursued further. The discussion of the Farmington sites follows presentation of research questions for the BMII period. After the BMII discussion, the Farmington site data are examined in terms of the research questions of both periods.

Basketmaker II

Recent research interests that center on the BMII period are presented by Dykeman and Langenfeld (1987:101-104). The current research thrust for BMII also focuses on understanding the settlement-subsistence system of the period, with special emphasis on the role of cultigens in the economy and the role of sedentism and/or mobility in the settlement pattern of the period. Two rather divergent hypotheses of BMII settlement and subsistence have been developed (Bearden 1984; Eddy 1966); these are characterized as (1) a modified Archaic, or (2) a modified Anasazi cultural system (Dykeman and Langenfeld 1987:101-102).

The modified Archaic system model proposes a seasonal round based on a subsistence pattern of hunting and foraging, supplemented by casual horticulture. Band-level social organization is postulated with late fall and winter aggregation into macrobands. Application of this hypothesis requires identification of BMII sites with attributes that indicate seasonal occupation by macrobands and microbands (Bearden 1984). A test of this hypothesis was conducted on data from Black Mesa by Bearden (1984). The study had mixed results, with only about half of the sampled sites fitting the proposed settlement system.

The modified Anasazi cultural system model proposes that there were permanent habitations supported by subsistence agriculture, supplemented by hunting and gathering. Permanent habitations consisted of villages in cave or open settings composed of cribbed log structures or pithouses. Isolated habitations consisted of one or two houses or small cave shelters. Several excavated BMII sites located in tributaries north of the San Juan River show these attributes. Such sites have been reported by Eddy (1966) from the Navajo Reservoir District from the Los Pinos phase (A.D. 1 - 400), and from the Animas River Valley by Morris and Burgh (1954). Two of the village sites reported by Eddy contained large structures that were interpreted as having functioned as kivas (Dykeman and Langenfeld 1987:102; Eddy 1966:477-478). A few of the structures reported by Morris and Burgh (1954) were also significantly larger than average. Seyfarth (1983b) recorded more than 40 cultural features on the Ridge Site, which is apparently a large BMII village (Dykeman and Langenfeld 1987:102). Two structures were excavated and the remains of two others are present.

Based on this information, Dykeman and Langenfeld are of the opinion that a modified Anasazi cultural system was in operation during BMII times. They propose a community settlement model for the BMII period. Communities are expected to contain at least one village, several smaller habitation sites, and numerous specialized activity areas. Some villages may contain public architecture in the form of significantly larger structures.

It is not possible to evaluate the full settlement model proposed by Dykeman and Langenfeld with the data from the Farmington area owing to the limited number of BMII sites on the Elena Gallegos Project Lands. However, certain questions concerning settlement type, season of occupation, and nature of subsistence resources can be addressed. Other questions discussed in the initial project research design are also examined with the Farmington information. These include questions concerning the kinds of cultigens and wild resources in use, as well as chronological information associated with the use of cultigens. Information concerning the kinds of storage facilities present on sites and their times of use was also sought, as was information on site seasonality and location with respect to water and arable land.

Archaic and Basketmaker II on the Elena Gallegos Land Exchange Project

For research purposes during the ceramic analysis, the land exchange project was divided into three rough geographic groupings. Two of these were based on the locations of sites with respect to the northern tributary drainages of the San Juan: the Animas and the La Plata. Another grouping was established at some distance from the main project areas north of Bloomfield, New Mexico (Map 19-1; Table 19-11). These divisions were made to determine if local production in either the San Juan or La Plata valleys could be determined for the Farmington ceramics. Though some strides were made in this direction, the best assessment that could be made was that the pottery was indigenous to the Middle San Juan area, encompassing the La Plata, Animas, and San Juan valleys. The small sample of refired sherds did not lend itself to more detailed determinations (Raish, this volume). However, the geographic groups have proved useful as hueristic devices to organize the geographically extensive site data from the Elena Gallegos Project, since they facilitate examination of the small sites of the uplands between the main drainages in terms of their relationships to the larger sites of the river valleys. Thus, the groupings are maintained and used throughout this review of the Archaic and Puebloan periods of the area.

The following section examines the Archaic and BM II settlement-subsistence pattern and related research questions in each of the relevant geographic groupings. The small project areas located north of Bloomfield (Geographic Group I) contained no Archaic or BM II sites and, so are not discussed further in this section.

Geographic Group II - Archaic

Group II lies east of Farmington, south and east of the Animas, and north of the San Juan. As mentioned previously, one Archaic site with an early and a late component and four "unknown" lithic scatters were tested during the land exchange project. The four unknown lithic scatters (FA 1-9, 1-10, 2-15, and 2-18) all consist of concentrations of chipped stone of varying amounts and densities, fire-cracked rock, and groundstone (Bertram, this volume; Schutt, this volume). Three of the sites are located in mesa-top, dunal situations, while the fourth (FA 2-15) is located on the mesa headland separating the Animas and San Juan valleys. No definable hearths were identified on these sites, and they seem to represent one or more episodes of gathering and processing of vegetal resources. No plant remains were obtained from these sites, so no season of occupation is inferred. There is evidence of both formal and expedient tool use and/or manufacture on three of the sites, with evidence of expedient tool use only on one of the sites (FA 1-10). The sites are all within 0.5 km. of a possible water source, and appear to represent reoccupied special-activity loci or fairly short-term camp sites. The absence of hearths is puzzling if the sites are considered camp sites; however, they underwent very limited testing and unknown, subsurface hearth remains may be present. The best description of the sites is that they represent camp sites of varying duration and occupational history associated with the gathering and processing of vegetal foods. If Archaic in age, they would fit with the definition of limited base camps, temporary camps, or satellite sites as discussed by Hogan (1986) and Vierra (1980).

Site FA 2-17 also fits the description of a reoccupied limited base camp, with an occupational history including both the early and late Archaic and the Anasazi (Schutt, this volume). The site consists of several lithic concentrations, a hearth, an ash stain, fire-cracked rock, and limited groundstone. It is located in blowouts on dunal sand on the lower end of a gentle ridge that drops more steeply west of the site to a canyon bottom. There is evidence of both expedient and formal tool manufacture on the site. Tool manufacture, vegetal food processing, and hunting occurred on the site over a long time span. Botanical and faunal remains did not lend themselves to an assessment of seasonality, however.

Sites identified by other projects on Crouch Mesa within the Group II area include one probably Archaic limited base camp; six sites of unknown age that are composed of lithics, fire-cracked rock, and groundstone, and fit the pattern of limited base camps or special-activity areas associated with the processing of vegetal foods; and one BMII-BMIII special-use area associated with hunting. Though the sample of known Archaic sites from the Crouch Mesa area is quite small, it seems that these sites represent limited base camps associated with the gathering and processing of upland vegetal resources. Evidence of hunting is also present. The tested sites from the land exchange are all located in close proximity to a probable water source, and the majority are found in dunal settings. These sites are compatible with the serial foraging mobility strategy discussed by Elyea and Hogan (1983:393-402). The Group II data do not lend themselves to discussion of whether sites north of the river represent the late fall-winter portion of a seasonal round focusing on exploitation of the lowlands south of the San Juan in spring and summer, nor were any late fall-winter macroband or home-base camps found.

Geographic Group III - Archaic

This area represents the largest grouping of tracts examined for the land exchange and the majority of sites. The Group III zone is located on Hood Mesa north of Farmington between the Animas and La Plata rivers, and is cut by Farmington Glade Arroyo. Five middle-to-late Archaic sites and four sites of unknown age were located during the project. The four lithic sites of unknown age represent a varied group of site types which may or may not be related to the Archaic occupation of the area. Site FA 5-2 consists of lithic debitage concentrations in eleven solution basins in a deflated slickrock outcrop (Bertram, this volume). The lithics indicate both expedient and formal tool manufacture, and expedient tool use for scraping (Schutt, this volume). Bertram suggests that the area may represent a hunting stand or overlook where tool manufacturing occurred. The site is a reoccupied special-activity locus. Site FA 2-6A is also a special-activity locus with a focus on chipping and material acquisition. It seems to represent a single occupation. Site FA 2-9 is a multiple occupation area consisting of a sparsely distributed lithic scatter with a number of large tools. There is evidence of formal tool manufacture and expedient tool use on the site (Schutt, this volume). Ash stains are also present on the site, which is located in close proximity to FA 5-2. Schutt and Bertram (this volume) disagree on their interpretations of this site with Bertram favoring a special-purpose tool production location, while Schutt favors a seasonally occupied camp site or limited base camp on the basis of the wide variety of activities that took place on the site. The final member of the unknown category could be classed as a limited base camp (FA 5-1), with multiple occupations consisting of a lithic scatter, groundstone, a mano concentration, and a hearth. Both expedient and formal tool manufacture are represented on the site, and vegetal processing is suggested (Schutt, this volume).

All of the sites are within 0.5 km. of a possible water source and seem to represent both limited base camps and special-activity areas. Reoccupation is suggested for all the sites except FA 2-6A. Three of the sites are located on the slope of Hood Mesa overlooking Farmington Glade Arroyo, and the fourth is located in the Farmington Glade drainage on the northwest flank of Hood Mesa (FA 2-6A).

Five middle-to-late Archaic sites are also present in Group III. Four were tested while the fifth, FA 2-13, was excavated (Schutt, this volume). Three of the tested sites (FA 1-1, 1-2, and 1-5) are discussed as a group, while FA 2-13 and FA 2-12 are presented separately. These latter two sites are located very close to each other and may be related.

Within the first group of three tested sites, FA 1-1 and FA 1-2 represent reoccupied limited base camps located on the same ridgetop within 305 m of each other. They are located 0.2 km. from an intermittent water source, and consist of hearth remains, fire-cracked rock, and lithic scatters. Vegetal food processing is suggested for both sites, with evidence of hunting also occurring on FA 1-1. A radiocarbon date from FA 1-1 has a midpoint of 2738 B.C., which equates to the middle Archaic San Jose phase (presented in full by Bertram, this volume). The site also has evidence of later Anasazi occupation and a possible BMIII projectile point. Site FA 1-2 has sparse evidence (one sherd) of Anasazi occupation, but is primarily a multicomponent Archaic site. Two radiocarbon dates from features have midpoints of 1220 B.C., or Armijo phase, and 2250 B.C., or San Jose phase (presented in full by Bertram, this volume). A pollen sample from the area of the earlier radiocarbon sample yielded pollen from corn, cholla, prickly pear, grasses, composites, and cheno ams (Scott Cummings, this volume). Unfortunately, the stratigraphy of the feature is very complex and may show mixture with later deposits (Bertram, this volume). If valid, site FA 1-2 can be placed with other sites yielding early dates on corn. These remains indicate a summer-early fall season of occupation.

FA 1-5 is located on top of the hogback mesa dividing the Farmington Glade and the La Plata drainages, and commands a wide view. The site consists of a small lithic scatter, a small amount of fire-cracked rock, and a hearth. It lies 0.7 km. from Farmington Glade. A radiocarbon sample from the hearth produced a date with a midpoint of 1662 B.C., which falls within the Armijo phase (presented in full by Bertram, this volume). Bertram (this volume) suggests that the site may have served as a briefly-occupied hunting overlook over a long period. Schutt (this volume) suggests a brief occupation on the basis of the absence of evidence for tool manufacture as well as the relatively small amount of lithic material that is present. As such, the site is classed as a special-activity locus. Botanical samples from the site were not informative.

Archaic sites FA 2-12 and FA 2-13 are located in proximity on the eastern margin of Farmington Glade Arroyo on a stabilized dune. FA 2-12 is a small lithic scatter, with an equally small amount of fire-cracked rock and groundstone. It is suggested that FA 2-12 is related to the much larger FA 2-13 (Bertram, this volume; Schutt, this volume). Site FA 2-13 is composed of a dense scatter of lithics and concentrations of fire-cracked rock, bone, and groundstone. Three features were identified: a hearth/roasting pit, a fire-cracked rock concentration, and a hearth (Schutt, this volume). Hunting and processing of vegetal foods occurred on the site. In addition, formal tool manufacture, tool maintenance, and tool-use occurred on the site. Later stages of lithic reduction are emphasized, specifically formal tool manufacture, but all stages of reduction are present (Schutt, this volume). Radiocarbon and thermoluminescence dates from the site indicate an occupation in the Armijo phase of the Archaic or possibly as late as early En Medio-BMII. Projectile points include late Archaic Armijo phase types as well as an Anasazi type (Schutt, this volume).

Schutt discusses the possibility that FA 2-13 represents a macroband camp or home base camp occupied in late fall-early winter, as suggested by faunal evidence presented by Bertram (this volume). She concludes, however, that evidence favors a reoccupied limited base camp (or microband camp), as suggested by the serial foraging model of Elyea and Hogan (1983:393-402). She states:

> In sum, FA 2-13 may have been a microband residence occupied for one or more fall seasons in the Armijo phase of the Archaic. It appears to represent the exploitation of a narrow-spectrum resource base focusing on goosefoot, seepweed, and juniper berries. Faunal resources were also an important supplement to the diet. This pattern fits well with a serial foraging model emphasizing the importance of water and plant resources in settlement and subsistence.

Sites identified by other projects in and adjacent to the Group III lands consist of both occupations defined as limited base camps with probable reoccupation, and special-activity areas primarily representing lithic tool manufacture or material acquisition and testing. There is also a lithic reduction site located near an outcrop of silicious material. Three sites from the Shumway Arroyo vicinity have been identified to the San Jose phase of the Archaic, and several known Archaic sites, which appear to be limited base camps, have been excavated in the La Plata Valley. The majority of the sites are lithic scatters of unknown age, however.

In summary, the Archaic sites north of Farmington on Hood Mesa and areas to the west represent both reoccupied limited base camps, associated with vegetal food processing and hunting, and limited-use or special-activity sites. The settlement-subsistence pattern is consistent with the serial foraging model developed by Elyea and Hogan (1983:393-402), as is the case for Geographic Group II to the east. Site locations in this area also demonstrate the importance of proximity to probable water sources, with the majority of sites located within 0.5 km. of a drainage. The Group III location contains more limited activity or special-use sites than the regions south of the river discussed by Hogan (1986) and by Vierra (1980:351-357), however. In addition, fewer sites north of the river, especially in Group III, are located in dunal situations which may relate to fewer of these areas in the surveyed lands of Group III. It also seems to relate to the location of the special-use sites in proximity to the specifically-targeted resources. These targeted resources are lithic materials and hunted game, both prevalent in the upland area. The occurrence of the resources apparently conditioned the occurrence of the special-use sites. It is possible, however, that some of the limited activity loci might be reclassified as limited base camps if they were completely excavated.

Determination of the status of limited-use sites through testing and excavation is necessary to understand fully the settlement system proposed for the northern San Juan Basin. This type of research is also needed to gain more detailed information on seasonality of occupations and on the nature of the food resources that were being consumed. Of particular interest is further information on the early occurrence and use of cultigens, as is hinted by the presence of corn pollen on site FA 1-2. This type of investigation is also needed to differentiate between possible home-base camps and limited base camps. Current research in the Group III area indicated summer-fall occupation and located no sites identified as home base camps. Thus, the Farmington project data cannot be used to shed light on the suggestion that groups exploiting lands south of the river during spring, summer, and fall may have wintered in upland areas north of the river. Identification of winter sites and home-base camps is a much-needed endeavor for future research.

Archaic sites that can be dated to specific phases of the Oshara Tradition show the majority of occupation in the middle-to-late Archaic with five San Jose and two Armijo phase sites and components. There is much less evidence for early Archaic occupation of the area. Understanding the nature of the earlier occupations north of the San Juan, both early Archaic and PaleoIndian, is also an important area for future research.

Geographic Group III - Basketmaker II

No solidly identified BMII sites were located in Group II, but three sites and components were identified in Group III. These are FA 2-6B, FA 3-3, and FA 2-8. Site FA 2-6B is a tested, multicomponent site containing evidence of

BMII and PII-III occupations. It is located on the northwest flank of Hood Mesa overlooking Brown Spring. A very light lithic scatter (too small to be analyzed), ceramics, and a probable hearth or midden area containing fire-cracked rock were present on the site. A radiocarbon date from charcoal in the hearth/midden has a midpoint of 23 B.C. (presented fully in Bertram, this volume), while the pottery from the feature is PII-III in age. As Bertram (this volume) states, the inconsistency in dates from the feature may indicate a mixed deposit or may indicate that the date is incorrect. He suggests the probable cause as mixture of the deposit. Botanical samples from the site are uninformative (Donaldson, this volume). The best interpretation of this site is that it functioned as a reoccupied cooking locus with a probable camp site function.

A component of FA 2-8 has a radiocarbon date with a midpoint of A.D. 235. This component consists of a basin-shaped hearth with corn pollen present (Scott Cummings, this volume). The site is a reoccupied resource procurement camp site with its major occupations during Anasazi times. It contains a possible habitation structure from the BMIII-PI occupation.

Excavated site FA 3-3 is considerably more informative. The site contains a significant En Medio-BMII occupation and a later Puebloan occupation. The BMII features range in age throughout the En Medio-BM II period from ca. 800 B.C.- A.D. 400 (presented fully in Raish, this volume). The site is situated in a protected location against a south-facing sandstone outcrop on the southeast slope of Hood Mesa. It is located 4 km. east of Farmington Glade Arroyo. Several small washes cut the site with a significant drainage running along its eastern border.

BMII features on the site show ample evidence of several episodes of reoccupation. The features consist of two cobble ring hearths, two unlined hearths, a cobble-filled roasting pit and associated midden (also associated with several later features), and an apparent outdoor use surface. Botanical, pollen, and faunal information from the features is somewhat disappointing, however, with many containing no evidence of subsistence resources whatsoever. Cholla and prickly pear pollen are present in several features, and corn pollen is present in one (Scott Cummings, this volume). Faunal materials give evidence of consumption of cottontail rabbits, jack rabbits, and medium-to-large mammals. The site reflects repeated uses as an upland camp site for the procurement and processing of animal and plant foods. Scott Cummings (this volume) suggests that corn may have been consumed on the site but probably was not grown there. The resources that are present indicate use in late summer to fall, and perhaps also in the spring.

There are very few BMII sites located on the lands surveyed during other work adjacent to the Elena Gallegos Project lands. Those that are present are found in the La Plata Valley as opposed to the upland areas. Considering that the BMII components on FA 3-3 were identified by an extensive excavation program, it is possible that many of the unknown lithic sites and sites identified to purely Anasazi times on the basis of ceramics may have unknown BMII components. It is also interesting that while the project sites seem to be reoccupied camp sites for upland resource procurement (limited base camps in Archaic terminology), two of the sites in the La Plata Valley are BMII villages. The other identified site is a reoccupied site very similar to FA 3-3 in composition. The Ridge site, excavated by Foster (1983), is located 3.5 km. from the Colorado border, and is a multicomponent site containing shallow, dish-shaped pithouses in the BMII component. South of La Plata, New Mexico, lies a multicomponent site excavated by Scheick (1983:90), which contains 23 excavated features consisting of hearths, roasting pits, and informal pits. This site is very similar in composition to FA 3-3. The BMII feature is associated with a single episode of corn harvesting and processing. Finally, Reed (1985) and Reed and Hancock (1985a, 1985b) have found shallow pitstructures on a site dating from ca. 700 B.C.- 300 B.C.

The BMII village sites found in the La Plata Valley seem to support the "modified Anasazi" BMII hypothesis of village-based community settlement proposed by Dykeman and Langenfeld (1987:101-104). The reoccupied resource exploitation camp sites, such as FA 3-3, FA 2-6B, FA 2-8, and the site discussed by Reed and Hancock, can lend support to either settlement pattern. They can be seen as either reoccupied special-activity areas of the community model or as reoccupied, seasonal microband camps as described by the "modified Archaic" model.

As far as other research topics are concerned, information from the Elena Gallegos Project lands shows the importance of wild resources to the subsistence base, though cultigens are present, and the importance of location near probable water sources. Storage facilities were not present on the sites. Since wild resource procurement and processing are the major suggested functions of the sites, they do not lend themselves to determining detailed information on cultigens. As mentioned for the Archaic, BMII research requires further work in both riverine and upland environments to clarify the nature of the settlement-subsistence pattern.

Anasazi

As Kirkpatrick states (1980:1537), the Anasazi occupation of the middle San Juan was extensive, as shown by the reports of early explorers and settlers describing the ruins of the San Juan, La Plata, and Animas valleys. Unfortunately, many of these sites were destroyed by the fields of Euroamerican farmers. Many of those that remain today are not in prime agricultural areas. The remaining sites range from small sherd and lithic scatters to large pueblos like Salmon and Aztec ruins.

The Anazazi occupation of the northern San Juan Basin and its northern periphery is considered to represent the continued, in situ development of early agricultural populations present in late Archaic-BMII times (Hogan 1986:13). Within the region, however, migrations have been proposed to account for certain developments from BMIII through PIII times. This is the case, for example, in one of the main areas of direct interest to this study, the La Plata Valley. Dykeman and Langenfeld (1987:18-22) review various proposals that suggest migration into the area during the BMIII through PII periods, primarily from the Chacoan and Mesa Verde regions. They conclude, however, that indigenous development with contacts and influences from these two regions of powerful socio-political systems are the best explanations for developments in the tributaries north of the San Juan (Dykeman and Langenfeld 1987:18-22).

Before proceeding to a discussion of developments on the Elena Gallegos Project lands and surrounding areas, a review of the cultural chronology of the BMIII-PIII time periods is presented. The dates used are taken from Powers et al. (1983) and are the following:

Basketmaker III	A.D. 500 - 700
Pueblo I	A.D. 700 - 900
Pueblo II	A.D. 900 - 1050
Pueblo III	A.D. 1050 - 1300

Cultural-Temporal Framework

Basketmaker III (A.D. 500 - 700)

Basketmaker III sites consist of villages composed of shallow pithouses with interior and exterior storage pits and hearths. As in the BMII period, some villages have a particularly large structure(s) that may have been used for ceremonial purposes, sometimes referred to as a great pithouse. Sites are located on alluvial terraces and benches, and on bluffs and ridges adjacent to drainages. The first readily identifiable ceramic type in the Basin occurs during this period with the appearance of Lino Gray, the widespread utility ware associated with BMIII. Small projectile points suggesting use of the bow and arrow, and trough metates also occur during this time span (Cordell 1979; Hogan 1986:13-14). As summarized by Hogan (1986:14), the widespread occurrence of villages which are located in close association with drainage valleys and the proliferation of storage pits have been cited as showing an increased dependence on agriculture. Wild plant and animal resources remained very important, however (Cordell 1979:135). Basketmaker III sites are found in the Navajo Reservoir District (Dittert et al. 1961), in Chaco Canyon (Hayes 1981), and in the Chuska Valley (Biella 1974). Populations are also present in the La Plata Valley (Dykeman and Langenfeld 1987; Morris 1939).

Pueblo I (A.D. 700 - 900)

In the San Juan Basin, Pueblo I sites are small and their density is low in comparison to southern Utah and Colorado. This may reflect the unsuitability of the Basin lowlands for agriculture during this period (Cordell 1982:66; Hogan 1986:14). The period is characterized by the appearance of neckbanded pottery and above-ground rooms. Cordell (1982:66) states that Kana-a Gray is the diagnostic neckbanded type of the Basin. Moccasin Gray and, later, Mancos Gray are the most common types of the northern periphery sites.

Villages usually consist of arcs of jacal surface rooms with masonry footings fronted by pithouses, some of which exhibit architectural features similar to or transitional to kivas (Cordell 1982:66; Hogan 1986:14). Pithouses remain as a house form in some areas, however. Pueblo I population in the northern San Juan Basin is highest in the northern periphery, including the upper La Plata River Valley, but there is also evidence of Pueblo I occupation in Chaco Canyon (Hayes 1981; Hogan 1986:15).

Pueblo II (A.D. 900 - 1050)

The Anasazi population of the Basin seems to have reached its maximum geographic dispersal during PII times. This is also the period of the rise of the social, political, and economic system of Chaco Canyon, which eventually came to exert influence throughout the Basin. Pithouse and above-ground structures remained in use during this period, with masonry replacing jacal as the most commonly used construction material for above-ground dwellings. Kivas appeared at this time, and Red Mesa Black-on-white was the most widespread whiteware. Neckbanded graywares were more prevalent during early PII times, while corrugated graywares became dominant during late PII (Cordell 1982:67; Hogan

1986:15). In the peripheral areas north of the San Juan, the primary ceramic types are Cortez Black-on-white, overlapped and followed by Mancos Black-on-white. These painted types are associated first with Mancos Gray and later with Mancos Corrugated.

According to Lekson (1984), as discussed by Hogan (1986:15-16), the Pueblo II period was the time of two major construction phases in Chaco Canyon. The first occurred between A.D. 900 and 940, and the second occurred between A.D. 1020 and 1050. The first outliers were also constructed during the tenth century, and were primarily concentrated in areas ringing the Chaco Basin. These communities generally include a Great House (one or more structures with Chaco-style masonry, large rooms, and Chaco-style kivas), and a surrounding community of eight or more smaller, residential sites within an area of 8 sq. km. surrounding the Great House (Powers 1984:25). The majority of the early outlier communities are located in the Cibola region along the southern periphery of the San Juan Basin. This, and the presence of imported southern ceramics, suggest a southern focus for the Chacoan system during the period from A.D. 920 - 1020. After A.D. 1020, the focus shifted to the Chuska Valley (Hogan 1986:16; Judge and Schelberg 1984). Ultimately, during PIII times, the focus shifted to the north with the rise of the northern outliers, Aztec and Salmon. During PII, however, surprisingly little is known of the occupation of the middle San Juan River Valley according to Hogan (1986:16). ARMS data indicate that the PII occupation of the area was of a relatively low intensity. This apparently low occupation may result from scant survey coverage of this portion of the valley, and destruction of sites by historic activities in the valley. Pueblo II occupation in the La Plata and Animas drainages is definitely known, however. The occupation here was of long duration, extending from Basketmaker III times at some of the sites (Dykeman and Langenfeld 1987). These occupations are discussed in considerably greater detail in the following sections as they bear directly on occupations of the Elena Gallegos Project lands.

Pueblo III (A.D. 1050 - 1300)

The Pueblo III period is marked by population aggregation in a few locations, the full development of the Chacoan system, and the eventual abandonment of the Four Corners area by the Anasazi. Within Chaco Canyon, the system was characterized by the construction of large, complex towns, and the presence of contemporaneous villages, luxury items, and water control features. In the Basin in general, outlier construction continued and intensified, and a complex network of roads was built (Cordell 1982:69-73; Hogan 1986:18).

Two building phases have been determined for the Canyon during PIII. The first of these occurred between A.D. 1075 and 1115, when construction reached a peak and required considerable labor investment. By about 1075, there were almost as many rooms at the large sites in the canyon as there were in the smaller villages. Lekson (1984:69) suggests that by this time, a disproportionately large number of elites occupied the canyon. He suggests that by A.D. 1050 - 1075, the function of the larger buildings had shifted away from being solely local central places, and that the entire canyon complex had become central to a core area surrounding Chaco Canyon, and to a regional system including the entire San Juan Basin (Lekson 1984:69, discussed in Hogan 1986:19).

The final building phase is dated between A.D. 1115 and ca. 1140. Structures built during this period have a ground plan and masonry construction style common to the San Juan-Mesa Verde area. Carbon-painted ceramics, characteristic of the northern periphery of the Basin and the Mesa Verde area during PIII, predominate at Chacoan sites of this time period. For these reasons, this time period was initially considered to represent an intrusion of a Mesa Verdean population. Currently, however, it is felt that these northern styles represent contacts with the San Juan and Mesa Verde areas, and a growing northern influence on the system itself (Hogan 1986:19).

There are several lines of evidence that support the view of growing northern influence in the Basin system in the mid 1100s. Between A.D. 1075 and 1140 there was an extremely large increase in outlier construction along the northern and western edges of the Basin. In addition, ceramic dates for sites associated with the Chacoan road segments indicate that the roads were completed over an approximately 100-year period from A.D. 1050 - 1150. Apparently the northern portions were completed last. The previously-discussed masonry, design plan, and ceramic styles of the last Chacoan building phase all demonstrate the presence of considerable San Juan-Mesa Verde contact and influence. Finally, the anomalously large size of the northern outliers of Aztec and Salmon suggests their importance to the system (Powers et al. 1984).

As reviewed by Hogan (1986:22-23), researchers have suggested that there was abandonment of Chacoan sites in the late 1100s, with reoccupation by Mesa Verdean groups until final abandonment at about A.D. 1300 (Hayes 1981). This pattern is also described for Salmon and Aztec (Cordell 1979:142). Currently, the abandonment of Chacoan Great Houses is seen more as a population decline or a decline in occupational intensity, with a shift in social affinity and contact towards the north, as opposed to a northern reoccupation (Cordell 1979:142). At any rate, it seems that the Chaco Canyon-centered portion of the system had ceased to function by A.D. 1175. Beginning about A.D. 1200, however, there may have been an attempt to re-establish a Chaco-like system centered in the San Juan and Animas drainages (Hogan 1986:23). Eventual abandonment occurred by A.D. 1300.

The development, functioning, and collapse of the Chaco system are the subjects of considerable ongoing research. These topics are not examined further here owing to the nature and location of the Elena Gallegos Project lands. The project lands served as upland resource procurement and processing areas over time, possibly related to puebloan sites of the northern periphery. The sites on the project lands show very little evidence of contacts outside the San Juan, as determined by the ceramic study (Raish, this volume). Thus, they lend themselves to research questions focusing more specifically on resource exploitation and occupation of the uplands of the northern periphery, as opposed to more general questions concerning the operation of the Chacoan system. The following section presents a review of Anasazi sites in the vicinity of the project lands.

The Anasazi in the Northern Periphery of the San Juan Basin

In contrast to the Archaic occupation, the Anasazi occupation north of the San Juan is well documented, especially in the major tributary drainages. Powers et al. (1983), in their discussion of Chacoan outliers, describe five outlier sites in the vicinity of the current project areas (Map 21-4). They are the following: Salmon, Aztec, Sterling, Morris 39, and Morris 41. Several others are also present but were not discussed in the outlier study. Salmon is located on the north bank of the San Juan River, southwest of Bloomfield, New Mexico, and southeast of Farmington. Elena Gallegos Geographic Group I lies in the uplands north of Salmon (Map 19-1; Table 19-11). Aztec is located on the first alluvial terrace north of the Animas River, north of Aztec, New Mexico. Sterling lies on the western edge of the alluvial terrace bordering the Stewart Canyon Arroyo near its junction with the San Juan River south of Farmington. Elena Gallegos Geographic Group II lies between the Animas and the San Juan and Geographic Group III lies between the Animas and the La Plata rivers (Map 19-1 and Table 19-11).

The Sterling site has an early Pueblo II and a late Pueblo III occupation as determined from ceramic data. Dendrochronological dates from Salmon indicate early and late PIII construction episodes (Irwin-Williams and Shelley 1980), while Aztec construction also occurred during PIII times, with a late PIII reoccupation or resurgence. Both Salmon and Aztec yield abundant evidence of association with a community of contemporaneous surrounding sites (Stein and McKenna 1988). It is possible that Sterling is also the center of a community of associated sites, but this is not yet certain (Powers et al. 1983:141).

Both Site 39 and Site 41 are located in the La Plata Valley. Site 39 is situated near the confluence of Barker Arroyo and the La Plata, northwest of Farmington and southwest of La Plata, New Mexico. Site 41 is located on a high gravel terrace above the west bank of the La Plata, south of the Colorado border and north of the town of La Plata. Both of these sites are associated with substantial communities of surrounding sites and have occupations ranging from BMIII through PIII. This duration of occupation mirrors the length and intensity of Anasazi occupation in the La Plata Valley as a whole.

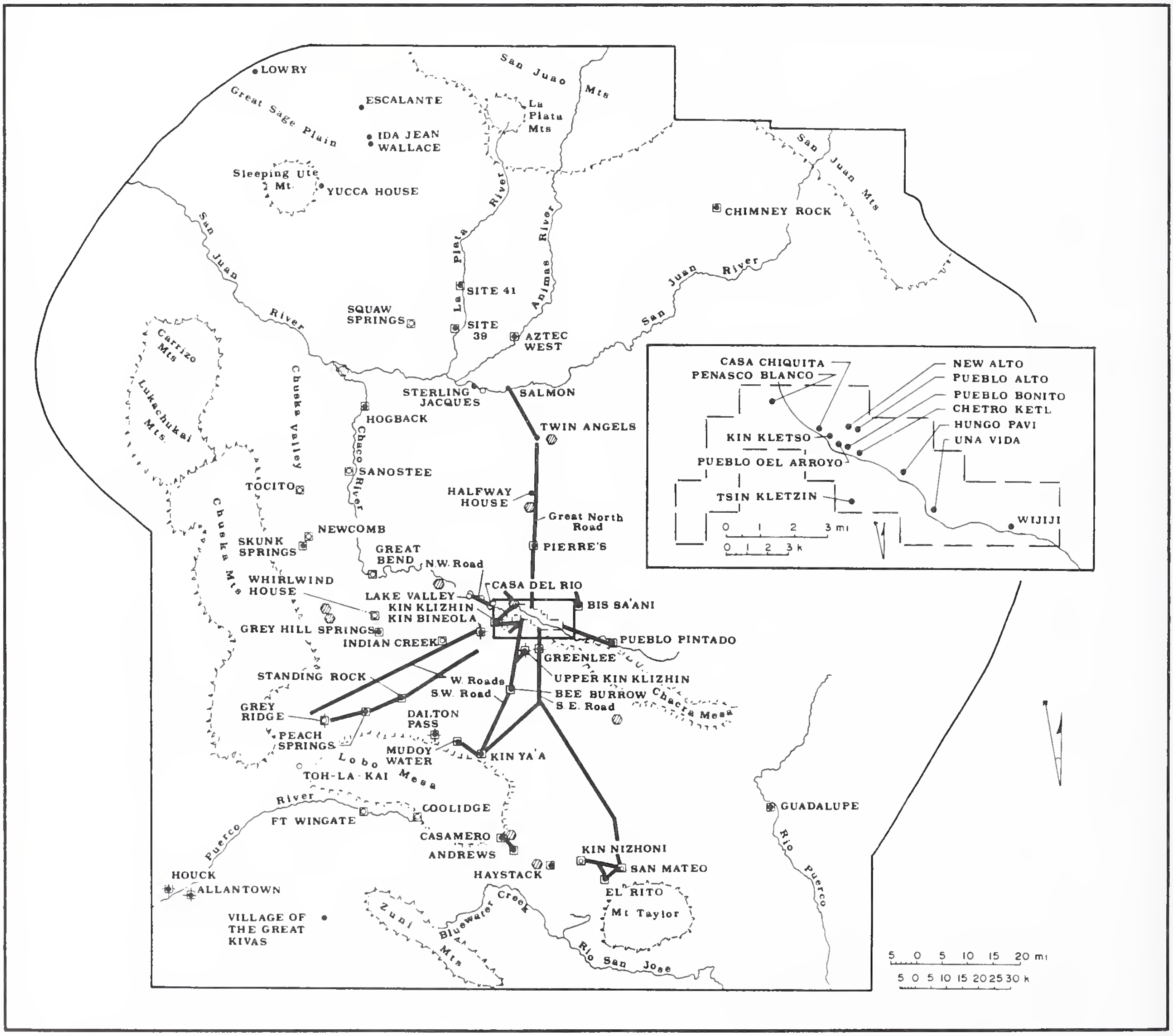
As mentioned previously, considerable archeological survey and excavation have been conducted in the La Plata Valley. Recent work (Lancaster 1982; Nickens 1978), consisting of survey from the Farmington area to the Colorado border, identified 43 prehistoric sites, the vast majority of which are PII-III in age (Lancaster 1982). Based on discussions of use radii around habitation sites (Powers et al. 1984:261-262), which are discussed more fully in the following section examining research questions, I reviewed information on the sites lying within 10 miles (16 km.) and 5 miles (8 km.) of Farmington. These figures are based on the assumption that the Elena Gallegos Project lands on Hood Mesa would lie within the use range of occupants of these sites.

Eight PII-III sites and one PII site are located within the five-mile range. These sites consist of sherd scatters, small cobble mounds suggesting one or two room structures, and two apparently substantial roomblocks - one with a kiva depression and one with a possible kiva. Within the ten-mile range, five additional PII-III sites, one early PIII site, one PI-II site, and one BMIII-PIII site (Morris 39) are located. Within the ten-mile range, then, there are a total of 17 sites, one of which is the large community site of Morris 39. The remainder consist of sherd and lithic scatters, small cobble mounds suggesting one or two room structures, and two additional, potentially complex structures with wall alignments (Lancaster 1982).

As a part of the La Plata Valley Overview, Dykeman and Langenfeld selected five study areas for in-depth examination. Two of these fall within the designated 10-mile examination area: the East Side Rincon and Morris 39 (Map 21-3). The East Side Rincon study area encompasses 160 acres and contains five prehistoric sites.

Anasazi sites and components in the area include the multi-component East Side Rincon site which contains evidence of a BMIII-PI community with a number of permanent dwellings and at least one great pithouse. The site also contains a much smaller PII-III component with a possible isolated great kiva. These sites include one PII-III small pueblo or village, one PII-III site of indeterminate function, and two undated (possibly Anasazi) specialized activity sites (Dykeman and Langenfeld 1987:52-53).

The Morris 39 study area includes five sites within a ca. 98-acre section of privately-owned land. The main site is the previously discussed Morris 39; others include a small PI-II pueblo, a PII-III pueblo, another small PII-III pueblo or village, and a PII-III specialized activity area. Dykeman and Langenfeld (1987:82) argue that all the PII-III manifestations form part of the late Puebloan community associated with Morris 39. In addition, a large BMIII-PI site has been identified on the east side of the river across from Morris 39. The site contains both pithouses and cobble structures, and represents a large



Map 21-4. Chacoan Outliers of the San Juan Basin, ca. 1050-1175 A.D. (after Powers, et al., 1983:2).

village (Dykeman and Langenfeld 1987:82). The archeological work in the La Plata Valley confirms the assessment that the region contains a long occupational history with in situ development and change through time. Though Chacoan influences and contacts are seen at the large outlier sites, the majority of ceramics at both the large sites and the smaller ones are locally-produced San Juan wares (Raish, this volume). The information on local production of ceramics combined with the long occupational history of the valley confirms the scenario of local development as opposed to migrations from either the south or north (Dykeman and Langenfeld 1987).

As discussed for the Archaic time period, areas to the west of the La Plata Valley in the vicinities of Shumway Arroyo (Map 21-1) and Dain Arroyo (Map 21-2) have undergone detailed archeological work, and show considerable evidence of Anasazi occupation. Approximately 70 Puebloan sites were identified in the almost 7000-acre San Juan Mine Coal Lease survey carried out in an area encompassing portions of Shumway and Westwater arroyos (Powers et al. 1980). These sites were divided into three type categories: multi-room sites, one to three room sites, and non-structural sites. Of the 70 identified sites, 31 were non-stuctural, 26 were one to three room, and 13 were multi-room. The sites represent the Pueblo II and Pueblo III periods, with the majority falling into Pueblo III times. This substantial occupation is suggested to relate to larger sites in the Squaw Springs and Navajo Springs areas, or in the San Juan River Valley.

Examination of the Dain Arroyo vicinity identified a total of 15 sites (Chapman and Biella 1979). One consists of an unknown masonry feature, while eleven are lithic sites of unknown age. These have been previously described under the Archaic section of this study, though it is recognized that they could just as easily represent Anasazi lithic procurement and manufacturing locales. Three sites contain evidence of masonry structures, and are dated to the PII-III period. They contain a minimum of two to three rooms. One site has a single exterior hearth or cist. Chapman and Biella (1979:82-84) suggest that the Dain Arroyo sites fit into a settlement pattern with larger sites located in the major drainages such as the La Plata, and smaller sites located in the minor drainages such as Dain Arroyo. They envision that this settlement pattern indicates either that:

1. The small settlements are self-contained, year-round habitations with variation in settlement size conditioned by environment and variable productivity; or that

2. Variation in settlement size reflects a seasonal aggregation-dispersal strategy in which larger sites are the winter home base of groups who disperse in warmer months. The smaller sites (such as those along Dain Arroyo) are occupied for agricultural work and/or wild plant and animal procurement. Some of the procured or produced resources are then transported back to the "home" site for winter consumption.

These suggested patterns are discussed more fully in following sections.

To the east of the La Plata River, on Hood Mesa north of Farmington, a 20-acre survey was conducted for the Anasazi Pageant Amphitheatre. This survey located five sites, one of which was occupied during Anasazi times. Ceramics indicate a BMIII-PI occupation and a PII occupation at a small rockshelter site considered to have been a locus of seasonal procurement activities (Burns 1988).

As stated previously, this area encompasses Geographic Group III of the land exchange (Map 19-1; Table 19-11). During the project testing and excavation phases, ten Anasazi sites were studied from this area. The unknown lithic sites from the area have been previously discussed under the Archaic section. Of course, these sites could also be from the Anasazi time period. The dated Anasazi sites and components range in time from BMIII through PIII, with a few isolated occurrences of PIV ceramics. The majority of the sites are multicomponent showing reoccupations throughout Puebloan times. Most fall within the PII-III period. The full range of site types is present in the area, including habitations, fieldhouses, wild resource gathering and processing camp sites, and day-use gathering sites (Bertram, this volume; Raish, this volume). The Group III sites from the project lands are discussed in detail under the section on Anasazi settlement pattern and research questions.

Other archeological work in the area has been conducted south and east of the Animas River, north of the San Juan River, and east of Farmington in the area of project Geographic Group II (Map 19-1 and Table 19-11). An excavation project in the immediate vicinity of Farmington conducted by Moore (1988) examined two PII non-structural lithic and ceramic scatters, the Lorena site (LA 46683) and the Lake Street site (LA 46684). Moore explored the possibility that the sites were either resource procurement locales or seasonal farmsteads. He argued for seasonal farmsteads on the basis of the ceramic assemblages, the absence of resource procurement tools, and the location of the sites in a major river drainage - the San Juan. He suggests that only ramadas or windbreaks were present on the sites (Moore 1988:50).

Archeological surveys on Crouch Mesa, also in the Group II area, have been conducted for the county road

(Watson 1983), and for a proposed landfill (Moore et al. 1987). The road survey identified nine Anasazi sites assignable to the PI-III periods. The majority of the sites are apparently from the PIII time span. The sites include those that are non-structural sherd and lithic scatters, those with evidences of PII-III small masonry habitation structures, and one with a possible pithouse. This latter site has a PI component distinguished on the basis of ceramics. Watson (1983) suggests that the small, non-structural sites served as resource procurement locales, while those with evidence of structures may have been fieldhouse locales. There is also a previously recorded large pueblo site (LA 2514) located on a high cliff on the south bank of the Animas, with which the smaller sites may have been associated. They may also have been associated with other large sites in the vicinity such as Aztec, Salmon, Jacquez, and Sterling (Watson 1983).

The 160-acre landfill project located seven apparently later Puebloan sites (PII-III) and one multi-component BMII-III and PII-III site (Moore et al. 1987). The sites represent habitations, fieldhouses, resource procurement locales, and one possible pit feature or structure.

Three Puebloan sites were found in this area of the Elena Gallegos Land Exchange. All three are multi-component, with major occupations ranging from BMIII-PIII. They include a rockshelter with a possible fieldhouse in association, and two resource procurement locales - one a camp site and one a difficult to interpret "unknown." As stated for the Group III sites, these sites will be discussed further in the following section examining Anasazi settlement patterns and research questions.

Settlement-Subsistence Models and Research Questions

Anasazi settlement and subsistence have been the topics of considerable research interest for many years, with various models developed to aid in interpretation of the observed archeological remains from this period. Two of these settlement-subsistence models are particularly emphasized in this study. The first is a settlement-subsistence model developed by Dykeman and Langenfeld (1987:25-33) from the community concept as discussed by Dykeman and Langenfeld (1987:25-33), Marshall et al. (1979), and Breternitz et al. (1982). It has considerable merit as a means of exploring the roles and relationships of the small sites located during the land exchange project.

In essence, the concept of community presents the view that individual communities are dependent upon the operation of social, political, economic, and religious systems to serve as the integrating factors that maintain and adapt the community to the cultural and natural environment (Dykeman and Langenfeld 1987:29). The material remains of these systems, then, can be seen in the archeological record. Community studies were first applied to Chacoan community structure in both the earlier (BMIII-PI) and later (PII-III) time periods. These models were adapted by Dykeman and Langenfeld (1987:105-112) for use in examination of the sites of the La Plata River Valley.

For the BMIII-PI time period they envision a community grouping centered on a nuclear community containing a pithouse village with at least one great pithouse (a larger than normal structure presumed to have served a ceremonial or integrative function, i.e., public architecture). Surrounding the nuclear community are a number of sites such as pithouse villages, multiple pithouses, single pithouses, and specialized activity areas or sites. Of special interest to the current study are the single pithouse sites and the specialized activity sites. In later Puebloan times (PII-III), more complex community structures are present. Dykeman and Langenfeld (1987:106-112) focus on describing the Chacoan outlier communities of the La Plata for this time period, but their descriptions also apply to the communities of Aztec and Salmon. These nuclear communities contain a Great House, a great kiva, a number of villages (a room block and two or more associated kivas), small pueblos (a room block and one associated kiva), single and multiple room structures, and other features of habitations. Surrounding the nuclear communities are villages, small pueblos, multiple and single room structures, and specialized activity areas or sites. As in the case of the earlier time period, this study focuses on the isolated habitation structures and the specialized activity sites.

The small sites from the project lands are examined in terms of their possible role in the community structures of larger puebloan habitation sites in the major drainages of the San Juan and its northern tributaries. The view that the small sites located in the northern uplands are related to larger Anasazi sites of the area leads to the second subsistence-settlement model examined in this study - that of adaptive diversity. This model and the research questions derived from it are discussed in greater detail in the REVISED RESEARCH FRAMEWORK section of Chapter 4 (Raish, this volume). This model has been proposed by several Southwestern researchers (Cordell 1982:59-83; Cordell, Schiffer, and Upham 1983:9-27; Green n.d.; Tainter 1985; Upham 1982, 1984) as an alternative to the traditional view of Puebloan abandonments. In brief, the idea of adaptive diversity suggests that Puebloan period abandonments represent "adaptive shifts to more areally extensive and efficient strategies" (Upham 1984: 250), as opposed to physical departures from an area. The shift to emphasis on a foraging strategy would give the appearance of abandonment since building episodes or occupations at major pueblos of the area would cease or be curtailed. Upham states that such shifts appear to have been relatively common in the past. It also appears that "...different groups, some relying on strategies emphasizing sedentism and agriculture, some relying on mobility, and hunting and gathering, coexisted, perhaps symbiotically" (Upham 1984:251). Thus, Upham sees an alternation of strategies from sedentism to foraging and back again, as well as co-existence of sedentary and forager groups during some time periods. To sum up his view, "During some periods (those characterized by major pueblos) relatively more hunter-gatherers were assimilated into a sedentary lifestyle; during others (those often characterized by abandonment), relatively more sedentary agriculturalists were forced into a pattern of hunting and gathering" (1984:238). Thus, in terms of the adaptive diversity model, the small sites identified during the land exchange project might represent resource procurement loci of groups pursuing a forager strategy in the area during Anasazi times. In terms of the community model they might represent the special-activity sites of groups resident at larger pueblos in the area.

To evaluate these two settlement-subsistence models, we must devise means of differentiating the hinterland sites produced by sedentists obtaining wild resources from those produced by non-sedentary groups. This question of identification is discussed in the REVISED RESEARCH FRAMEWORK section of Chapter 4 (Raish, this volume), and several means of making tentative identifications are suggested. Several of these lines of evidence proved valuable, and are used to suggest which type of group may have produced the various Farmington sites. These lines of evidence are briefly reviewed here.

Information on site chronology, presence or absence of structures, site location, subsistence, and ceramic assemblages is examined. This type of information is used first to suggest whether the limited activity sites (or special-activity sites of the community model) represent field house or wild-resource-procurement locales. It is assumed that field house sites represent a portion of the agricultural cycle of sedentary groups and, thus, are related to larger habitation sites in the area. Sebastian's work (1983:409-419), using the ratio of jars and utility wares to other ceramics, is used to make this distinction. Based on ceramic assemblage patterning and data on structures, she defines four site categories: habitations, residential field houses, day-use sites, and storage sites. Her categories and their attendant ceramic patterns are discussed in the ceramic section of this report (Raish, this volume).

According to Sebastian (1983:409-419), sites that do not fit the habitation or field house pattern may represent day-use field-monitoring sites, storage locales, or wild-resource-gathering locales. Considering the upland location of the Farmington sites, as well as floral and faunal remains from tested sites, we feel that the majority of the day-use sites represent resource procurement locales as opposed to field monitoring sites or storage sites. We also are of the opinion that many of them represent resource procurement camp sites in addition to day-use resource procurement sites. Information on the presence or absence of hearths, cooking facilities, and midden areas is used to assess whether these sites represent day-use wild-resource-procurement sites or wild-resource-procurement camp sites. Non-structural sites with no visible evidence of hearths, cooking facilities, or middens are considered to be day-use sites. Such sites falling within the chronological range of major pueblos of the area, exhibiting similar ceramics, and lying within a reasonable distance of the major pueblos, are considered to be related to the larger sites.

However, the term "reasonable distance" can be difficult to define and somewhat arbitrary. Powers et al. (1983:283-284) present a discussion of economic range based on an examination of resource procurement and production ranges of ethnographic groups. They suggest that Puebloan groups might range up to ten km. (six miles) from their home site for both day-use agricultural field locations, and hunting and gathering trips. At this range and beyond, presumably both field houses and temporary wild resource procurement camps would be set up. This range seems somewhat large for field locations, even with field houses, and short for hunting and gathering trips, since longer trips with the use of temporary camps are not included. Bradfied (1971) suggests 6.4 km. (4 miles), as a maximum for Hopi field locations before the use of wheeled vehicles to transport the crop back to the home pueblo before the onset of damaging November rains. The 10 km. range for field locations is used in this study, but it is borne in mind that field locations are probably closer to the home site, and field houses may appear closer to the home pueblo, depending on varying conditions. Flannery (1976) suggests 10-15 km. (6 to 9.3 miles) radii for hunting and gathering in Oaxaca, while Bushmen are reported to make 10 km. trips in one day and 16-20 km. (ca. 10 to 12.4 miles) trips if a temporary camp is set up (Lee 1968). Thus, this study uses a 10-15 km. radius for hunting, gathering, and resource procurement trips, with a temporary camp used beyond 10 km. Day-use resource procurement sites, then, would lie within 10 km. of the home site.

identifying the sites of foragers in the area can become very difficult. If the adaptive diversity model is applied, then the primary times of hinterland occupation and return to a foraging strategy should occur during the identified periods of "abandonment" or population decline at the major pueblos. Unfortunately, the ceramic types of the region, which are the major means of dating the small special-activity or resource-procurement sites, are not fine enough to be tied specifically to those time periods (Raish, this volume). So, it is very difficult to tell if the small, hinterland sites are being occupied during periods of decline at the larger sites of the area or not.

As previously mentioned, resource procurement camp sites, which might be associated with forager groups, can just as easily be associated with groups from larger pueblos on resource procurement forays beyond the day-use range of the home site - 10 km. for purposes of this study. If these camp sites contain substantial amounts of non-local ceramics, however, it can indicate the possibilty of a non-local group foraging in the area. The general pattern for the northern periphery of the San Juan seems to be that intrusive wares remain at the large sites and rarely appear on small, local sites (Raish, this volume). Thus, a preponderance of non-local ceramics on a foraging site probably indicates the presence of a non-local group.

Another interesting possibility for identifying forager sites has been noted by Eschman (1983:384). He has argued that hunting and gathering camps in very close proximity to pueblos would be the work of foraging groups. He bases this on the assumption that resident Puebloan groups would not set up camps so close to home. There is difficulty with applying this argument to the sites from the land exchange since many are reoccupied sites with evidence of both early and later occupations. Since not all the features are dated on the majority of the sites, the camp site portions of the site may relate to earlier occupations, while the Anasazi reoccupation represents day-use only. Another dating-related problem with the occupations of the project lands lies in interpreting the undated lithic sites which could have been produced by Archaic or Anasazi groups, or by late forager groups in the region during Anasazi times. Future work on dating hinterland resource procurement sites is clearly needed before the settlement-subsistence system can be understood.

As this discussion indicates, distinguishing forager-produced resource procurement sites from sedentist-produced resource procurement sites at our current level of knowledge is extremely difficult. It seems that the best place to explore the usefulness of the adaptive diversity model is not on the special-use upland sites but rather on the small agricultural sites of the minor drainages, as discussed by Chapman and Biella (1979) and Beal (1984). If occupied during the appropriate periods of decline, these sites may represent Puebloan strategies of adaptive diversity, with a return to smaller population groups focusing on limited agriculture in the smaller drainages, in combination with hunting and gathering. Unfortunately, these types of sites are not present on the project lands, so this topic remains open for future discussion.

The Anasazi on the Elena Gallegos Land Exchange Project

This section examines the Farmington sites of Geographic Groups I, II, and III in terms of their potential to shed light on the larger settlement-subsistence system in operation in the region during Anasazi times. The occupations are examined using both the community model and the adaptive diversity model.

Geographic Group I

This group is composed of several small parcels of land lying between 2.4 and 4 km. (ca. 1.5 to 2.5 miles) north of Bloomfield, New Mexico. Three archeological sites (FA 4-1, 4-2, 4-4) were located during survey of these lands (Map 19-1; Table 19-11; and Map 21-4). These sites are reported briefly from survey but were never tested or excavated. All three of the sites are lithic and ceramic scatters and are discussed in the ceramic report (Raish, this volume). The sites fall within day-use range of Salmon Ruin, and two of them (FA 4-1 and 4-2) fall within the time range of occupation of Salmon based on their ceramic assemblages. The ceramics from the two small project sites are consistent with those found at Salmon, and the sites probably represent reused, day-use locales associated with Salmon (Raish, this volume).

The third site (FA 4-4) has a small ceramic assemblage (six sherds of Piedra Gray) which dates from PI through early PII times, and falls before the occupation of Salmon. The site may be related to earler occupations of the area or may represent contact with the Navajo Reservoir District to the east, since the pottery resembles a grayware from that district. In the latter case, the site may indicate the presence of early, non-local foragers in the area. The pottery was probably locally made, however (Warren, this volume). Thus, the site more than likely relates to local occupations.

Geographic Group II

Three tested and/or excavated sites relating to the Anasazi period are found within the Elena Gallegos Project lands in this area (Map 19-1 and Table 19-11).

Previously discussed work indicates that the most intense use of the area occurs during PII-III, with a much lower level of occupation during BMIII-PI times. As discussed by Hogan (1986:13-15), BMIII-PI occupations are scarce in the middle San Juan and are more prevalent in the tributary drainages.

One of the sites tested during the project (FA 2-19) is a PII-III non-structural sherd, lithic, and groundstone scatter. The other two sites (FA 3-6 and FA 2-16) show evidence of longer periods of occupation ranging from BMIII-PIII times. Based on an absence of camp site features, site FA 2-19 is considered to be a day-use special-activity site with an unknown function that may have included vegetal food processing (Bertram, this volume; Raish, this volume). The site is within the day-use range of the Sterling site, the Jacquez site, and a large pueblo site (LA 2514) on the south bank of the Animas discussed by Watson (1983), and has a local, middle San Juan ceramic assemblage (Map 21-4). It is apparently a day-use special-activity site related to these larger habitations located along the major rivers.

Site FA 2-16 was also tested by the project, and consists of a multi-component occupation containing BMIII, PII, and PIII occupations. The site is discussed by Bertram (this volume) and has radiocarbon dates from the BMIII and PIII, periods and a local middle San Juan ceramic assemblage dating from the PII-III periods (Raish, this volume). The location consists of a rockshelter, petroglyph panels, ceramics, lithics, groundstone, ash, and burned rock. The rockshelter component was occupied throughout the lifespan of the site. Features from the site indicate that it may well be multi-functional as well as multi-component. It served as a wild plant and animal resource-procurement camp, and may also have served as a field house location during a portion of its occupation. As discussed in the ceramic report (Raish, this volume), pottery from FA 2-16 indicates a habitation-field house type of assemblage. Corn pollen and a charred corn cupule were found in the rockshelter (Donaldson, this volume and Scott Cummings, this volume), which may have been used for storage. (It is too small to have served as a habitation.) A broad, sandy wash, which could have been used for cultivation, lies adjacent to the site.

Throughout its use, FA 2-16 appears to have been a special-activity site for wild resource procurement, and perhaps agricultural purposes, related to the larger sites in the river valleys that have been previously mentioned. Though few BMIII sites are known from the middle San Juan, ENM 5030 does have a BMIII component along with later occupations, and is discussed by Whalley (1980) in her examination of puebloan sites located in the San Juan River Valley between Gallegos Canyon and the Animas River. Though FA 2-16 is a camp site-field house within day-use distance of the larger sites, it is not considered to be forager-produced, since it has a strongly local, fairly abundant (56 sherds) ceramic assemblage, and was possibly used as a field house.

The final site under discussion in Geographic Group II is FA 3-6 which was excavated during the summer of 1982. The site is a multi-component wild resource procurement and processing camp for both plant resources and wild game. Primarily occupied in late summer to fall, the site seems to have maintained its function as a wild resource procurement and processing camp throughout its use life. Fire-cracked rock and ash features have radiocarbon dates from BMIII, PI, and PII times (presented fully in the excavation report [Raish, this volume]). The ceramic assemblage consists of ten Mancos Corrugated jar sherds, representing a minimum of three vessels. As mentioned for the other sites in this grouping, FA 3-6 is within day-use distance of larger habitation sites along the San Juan and Animas Rivers. It may have served as a special-activity resource procurement site for these larger Anasazi communities. However, the site is a camp site within fairly close range of the larger habitations, and has a small ceramic assemblage for its long occupational span. Thus, it may have served as a forager camp site for some or all of its occupations. In sum, the majority of sites from Groups I and II represent special-activity resource-procurement locations associated with larger Anasazi communities, as discussed by Dykeman and Langenfeld (1987). Site FA 3-6, or some of its components, may be an exception to this categorization.

Geographic Group III

This group has the largest number of tested and excavated sites among the project areas, and shows the full range of Anasazi occupation from BMIII through PIV. The PIV occurrences represent isolated episodes of use, as shown by single sherds and one or two late dates on features. The major occupations range from BMIII through PIII, however (Bertram, this volume). Geographic Group III (Map 19-1 and Table 19-11) lies within the 10 km. (6 miles) day-use radius of many of the Anasazi sites of the La Plata River Valley (Maps 21-3 and 21-4), including those of the East Side Rincon study group, and within the wider 10-15 km. (6-9.3 miles) hunting and gathering radius of many other La Plata Valley sites, including Morris 39 (Dykeman and Langenfeld 1987:41-53). In reality, many of the sites are located less than 5 km. (3 miles) from the La Plata Valley sites. The use range of the La Plata Valley sites was discussed earlier under the section reviewing prior projects and known sites of the area. The project sites of the uplands of Group III also fall within the ranges of larger sites in both the Animas and San Juan valleys.

For ease of discussion, the sites and components of the area are broken down by time period and by site type. Since virtually all of the sites are multi-component occupations showing reuse over considerable time spans, components from the sites are generally being discussed for the various time periods. The BMIII and PI time periods are discussed together, since the same three sites have both of these components. During BMIII-PI, there is one resource procurement camp with a focus on hunted resources (FA 1-1), one possible pithouse (FA 2-8), and one field house-habitation (FA 1-6). The possible pithouse occupation is suggested on the basis of a ceramic assemblage matching those described by Mills for pithouses (discussed in the ceramic section [Raish, this volume]). No structures were found during site testing, but considerable staining was present; much of the site had been destroyed by erosion (Bertram, this volume). Ceramics from FA 2-8 show another occurrence of early contact with the Navajo Reservoir District area but are probably locally-made (Warren, this volume). As reviewed in the ceramic report (Raish, this volume), Warren has discussed the occurrence of Navajo Reservoir types at LA 50337, a site located on the La Plata River approximately 2 miles (3.2 km.) above its confluence with the San Juan. Thus, there are local occurrences of these types in the area. For this reason, FA 2-8 is not considered to represent an intrusive, non-local group in the area, but is considered to be a single, upland habitation locus associated with other site communities in nearby areas, as discussed in the community model (Dykeman and Langenfeld:26-33).

This designation is also the case for site FA 1-6, which is another multi-component site. It consists of a slab-lined pitstructure, an associated storage structure, and several small trash deposits (Raish, this volume). The structure shows evidence of reoccupation during the BMIII and PI time periods. Processing of both wild plant foods and corn occurred throughout the occupation of the site, which extends into PII-III times. Plant remains indicate a seasonal occupation for all time periods, occurring primarily in late summer and early fall. Thus, a late season field house-habitation is indicated for FA 1-6 during the BMIII-PI period. The three BMIII-PI components fit within the category of special-activity sites and isolated habitations, as described by the community model. They are probably related to the BMIII-PI occupations that have been discussed in the La Plata valley, since they all lie within the use range of those sites.

During the PII period, there are one pithouse habitation associated with wild-resource-procurement, two day-use resource-procurement locales, and two resource-procurement camps. The pithouse site (FA 3-3) is a multi-component site that was excavated during the Elena Gallegos project. Pithouses were a continuing habitation type during PII times (Powers et al. 1980; Vogler 1982), and are found in the area during this time period. Primarily PII ceramics, consisting of both decorated and utility wares, are found in association with the FA 3-3 structure. They are mainly local San Juan wares with minor contact with the Chuska area demonstrated by the presence of several sherds of a trachyte tempered utility ware. The site also contains discrete activity areas consisting of unlined hearths, cobble-ring hearths, and cobble-filled roasting pits. Several of these features also date to the PII period, and may be related to occupation of the habitation structure. The structure gives no evidence of season of occupation, but one of the roasting pits yielded evidence of late summer to early fall, and possibly spring, occupations (Raish, this volume). At the current level of knowledge, the best interpretation of the pithouse and its associated features is that it represents an isolated structure associated with larger PII communities of the La Plata. Current studies show apparently continuous occupation of the La Plata from BMIII through PIII times, so it is not possible to determine if the pithouse occupation might relate to a period of occupational decline at the larger La Plata communities and, thus, fit with the adaptive diversity model.

Several of the PII features date later than the structure and may represent independent uses of the site as a resource-procurement camp. Thus, the site is also listed as one of the PII resource-procurement camps. The other resource procurement camp is represented by a PII component on the previously discussed site FA 2-8. Though these components presumably represent procurement camps within the day-use range of the La Plata and Animas sites, they are near the upper end of the day- use range. At their distance, camps might be profitably established, especially when processing activities were occurring, as was the case with both of these components. Thus, these occupations are considered to be special-activity resource-procurement sites associated with the larger sites of the river valleys.

Two day-use resource-gathering sites also date to the PII period. These are FA 2-7 and FA 5-3. Site FA 5-3 represents a reused, day-use gathering locale, while FA 2-7 may represent a day-use gathering site or some special type of reused camp site. Bertram (this volume) suggests that FA 2-7 may represent a travelers' camp, a ceremonial location, or perhaps a wood gathering locale. The ceramic assemblage from the site consists of five decorated jars and one bowl, with no utility wares. The absence of utility wares indicates that processing and cooking probably did not occur on the site. The wide range of ceramics on the site indicates occupation over a long time span (Bertram, this volume; Raish, this volume). Non-local Jeddito wares may also indicate a late occurrence of intrusive groups, or merely ceramics, into the area. All of the PII sites, including FA 3-5 and FA 2-7, can be described as special-use sites or single habitations related to communities probably resident in the La Plata Valley.

A special category is set aside for the PII-III period since many of the sites dated by ceramics fall into that combination time range. Sites dating to this time range include one field house (the later component of the previously discussed site FA 1-6), one isolated agricultural feature, three day-use resource-procurement sites, and one resource-procurement camp site. The day-use sites include a quarry (FA 6-1); a presumed day-use gathering site (FA 6-4) with lithics, groundstone, and ceramics (and known only from survey); and a multi-component site which may represent a day-use site or a camp site (FA 2-6B). The site contains sherds, lithics, and a hearth or midden area, and has a BMII radiocarbon date. Pottery from the site consists of 17 sherds from one Mancos Corrugated jar (Raish, this volume). Thus, it seems that the camp site functions may relate to the earlier period, while the later occupation represented by the ceramics consists of a very minimal day-use occupation.

The resource-procurement camp site (FA 2-11) is open to several different interpretations. It is suggested to be Anasazi by Bertram (this volume) and to be Navajo by Schutt (this volume). It contains groundstone, a dense concentration of lithics, burned rock, and four hearths. However, only two ceramics are present on the site. If Anasazi, this site may represent a forager camp site in the area during Puebloan times. Its uncertain date makes it difficult to interpret. The other sites of the time period fit the pattern of special-activity sites and single habitations suggested by the community model.

The PIII period contains a resource-procurement camp site occupation from the multi-component site FA 3-3, which has already been discussed, and two day-use resource-procurement components which have also been previously discussed. Site FA 2-7, which was suggested as either a day-use gathering site or some type of special-use camp site with a long history of reoccupation, also has a PIII component which fits the same description. Site FA 1-1 is very similar to FA 2-6B in that the occupation has an early camp site component with a small number of later ceramics which may represent day use of the area during the later time periods. The final site of the geographic grouping is a quarry site with an undatable Anasazi occupation. The three sherds found on the site are unknown white and plain wares. Those sites dated to the PIII period also seem to fit the pattern of relationship to larger sites in the area, as has been the case for the majority of the sites from this group.

In summary, Geographic Group III demonstrates the same type of occupational pattern as can be seen for the Anasazi use of all the project lands. The occupation ranges from BMIII through Pueblo III times, with an emphasis during the Pueblo II-III period. On the basis of ceramics, use of the area is strongly local, with only a few instances of non-San Juan wares. These show contact with the Navajo Reservoir District during the earlier periods, and with the Chuska and Cibola areas during later times (Raish, this volume). The majority of the sites fit into the model of community interaction as special-activity sites or as single habitation sites (Dykeman and Langenfeld 1987:26-33). These sites indicate that the area was used mainly for wild resource-procurement but was also used for agricultural purposes.

In summary, this emphasis on wild resource procurement carries on the pattern of use of the area begun in Archaic times and continued up until abandonment of the region. In reviewing the occupational history of the area, it can be seen that major use of these lands occurred during the middle and late Archaic. Sites from the PaleoIndian and early Archaic periods are scarce, and not well known. Some of this scarcity may be due to low visibility, however. The Archaic occupation of the project lands and the northern San Juan in general seems to fit best within the serial foraging model suggested by Elyea and Hogan (1983:393-402). This model proposes short-term, reoccupied, limited or microband base camps located in areas of seasonally-available strategic resources. From these camps small groups exploited the desired resources. In the case of the project lands, these were both plant and animal foods. The model also proposes late fall and winter aggregation into macroband camps perhaps located in the uplands north of the San Juan River. No winter macroband camps were detected during the project, however, so this portion of the model remains unexamined.

With the advent of Basketmaker II times, evidence of aggregation into villages is apparent in the La Plata Valley. The upland occupation seen in the project areas consists of reoccupied resource-procurement camp sites - limited base camps. Though evidence of cultigens is present, wild resource procurement remained the focus of groups using the area during BMII times. The Elena Gallegos project sites from this period are not informative when it comes to determining if BM II groups had a village-based community settlement pattern, or followed a modified Archaic seasonal round with smaller camp site occupations (Dykeman and Langenfeld 1987:101-104). The reoccupied resource-procurement camp sites of the project lands can be seen as either special-activity sites of the community model, or as reoccupied seasonal microband camps as described by the "modified Archaic" model. However, the presence of villages in the La Plata Valley demonstrates that aggregation into village life was beginning in the area, and that some groups were participating in a community-based settlement pattern during the period.

During Anasazi times, population growth and aggregation continued. As discussed previously, the northern periphery of the San Juan Basin participated in the region-wide Chacoan social, political, and economic system, and ultimately came to dominate this system with the rise of the northern outliers, Salmon and Aztec. Throughout these time periods, however, the upland areas remained strongly local in orientation. Both a settlement-subsistence model of adaptive diversity and one of community interaction were explored for the small, upland Anasazi-period sites north of the San Juan. The majority of the sites fit most comfortably within the model of community interaction as special-activity sites or single habitations, used primarily for wild-resource procurement and some cultivation. Finally, the concept of adaptive diversity, the alternation between aggregation and dispersal, remains a very interesting one. This study suggests that the most profitable place to explore the usefulness of the adaptive diversity model is at the smaller agricultural sites located on the minor drainages of the region. This type of occupation may represent Puebloan adaptive diversity, with a return to smaller population groups focused on limited agriculture in combination with hunting and gathering.

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