SOUTHWEST REGIONAL OFFICE

DIVISION OF ANTHROPOLOGY

ARCHEOLOGICAL SURVEY
GILA CLIFF DWELLINGS
NATIONAL MONUMENT

JAMES E. BRADFORD

With Contributions By

James M. Rancier, Lonyta Viklund, A.J.T. Jull and Steven J. Lambert

Southwest Cultural Resources Center

Professional Papers No. 47

As the nations principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, parks and recreation areas, and to ensure the wise use of all these resources. The Department also has major responsibility for American Indian reservation communities and for the people who live in island territories under U. S. administration.

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1992

To

IDA and "DOC" CAMPBELL

ABSTRACT

As a result of the upcoming revision of the General Management Plan for Gila Cliff Dwellings National Monument, a complete archeological inventory of all National Park Service lands that comprise the monument was conducted to locate, identify and assess all cultural resources contained within those boundaries. The survey was conducted within the main unit of the monument and the detached TJ Unit, covering a total of 533 acres. In all, 45 prehistoric sites were located, representing the remains of several types of activities conducted by the prehistoric inhabitants between c. A.D. 550 and 1400. Results of analysis of both lithic and ceramic artifacts is provided and recommendations for future work offered.

TABLE OF CONTENTS

LIST OF FIGURES

FIGURE

LIST OF TABLES

TABLE

ACKNOWLEDGEMENTS

This report is the product of much work and represents the effort and cooperation of many people. To those listed below I offer my gratitude and appreciation for their part in this project; and my apologies to anyone I may have unintentionally omitted.

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The field crew was, of course, essential to the project and shared some memorable times in what I feel is one of the special areas of the Southwest. During the first field session, Jim Rancier brought his extensive experience to the task, and his knowledge of lithic materials in a complex geological setting was indispensable. He also contributed the lithic methodology section for the project as presented in Appendix 3. Laura Heacock took a break from the Forest Service to lend her ceramic expertise to the project and to lay the groundwork for that aspect of the study. Both of these people left the NPS for permanent employment soon after the first session. Lonyta Viklund took up the slack for the lithic and ceramic analyses and, because of her obvious field experience, became my "right hand" during the second field session. She also conducted the analysis of Don Morris' collection and integrated all analysis information into a working draft. Others who aided in the fieldwork during the second session include Ronald Ice, Daniel Lenihan, Chief of the Submerged Cultural Resources Unit, and Amy Halsband of the Division of Curation. Thanks, also, to Bob Viklund for transporting personnel and being his usual genial self and good cook.

With the US Forest Service I want to thank former District Ranger Jan Hurley and her staff for their support. Although we beat the helicopter out that was brought in to rescue us during the 1988 flood, the effort and expense was not wasted on the three trapped visitors. In particular, I would like to thank former interpretive ranger Terry Nichols for her interest, support and help during and after the fieldwork. Terry spent as much time as she could helping with the fieldwork and kept us on our archeological toes by asking questions important to the interpretive program. She also provided information on the history of the monument essential to the report. Thanks to Biologist Dave Peters for rounding out Appendix 1 by providing a list of grasses in the Gila forks area. Thanks, also, to Gila Forest Archeologist Robert Shiowitz for sharing his knowledge and experience of Mimbres archeology with me and giving me the excuse I needed to look outside "our" boundaries at the TJ Unit.

During the fire of 1991, interpreter Eric Finkelstein and his wife Sally were gracious hosts, allowing me to stay in their home and showing me archeological sites in the vicinity I would otherwise not have been able to see. Eric continues the interpreter's role of pressing for information and answers on the history and archeology of the area. I hope this report serves that function to some degree.

Stephen Lekson, Keith Anderson, Cherie Scheick, Ronald Ice and Stephen Adams reviewed and commented on all or parts of the draft manuscript while Erin Fleming provided technical editing. My thanks to all of these people for their contributions and advice. Any errors, omissions or misinterpretations in this report are, of course, the fault of the author.

James E. Bradford
Santa Fe
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INTRODUCTION AND DESCRIPTION OF STUDY

The National Park Service requires each unit within the national park system to have a General Management Plan (GMP) to guide the development and management of each unit. To insure that changing conditions, attitudes and problems facing each individual park are properly addressed, a periodic revision of each GMP is done to provide current information on such issues to park management. The existing GMP for Gila Cliff Dwellings National Monument is due for revision and, as part of the updating of information on all resources within the monument, park management needs more complete information of the cultural resources of the monument. This proposed action precipitated the inventory survey conducted by National Park Service archeologists in the fall of 1988 and spring of 1989. The results of that work comprise this report.

Gila Cliff Dwellings National Monument is a small unit of the system located approximately 45 miles north of Silver City in southwestern New Mexico (Figure 1). The monument was first authorized by Presidential Proclamation in 1907 and enlarged in 1962. The establishing proclamation, made by Theodore Roosevelt almost five years before New Mexico statehood, set aside the northeast quarter of section 27 (T12S, R14W) to preserve "the Gila Hot Springs Cliff-Houses" because of their "exceptional scientific and educational interest [and] being the best representative of the Cliff-Dwellers' remains of that region" (USG 1907:194). A second proclamation by President John Kennedy, in April of 1962, expanded the boundaries of the original monument by adding approximately 200 acres within section 27 and about 120 acres within section 22, which resulted in an expansion of this unit of the monument to the north, west and south, encompassing 480 acres total (USG 1962:3791). This act also added 53 acres surrounding TJ Ruin to the monument as a detached unit near the Gila Wilderness District Headquarters (Figure 2).

The 533 acres comprising the monument contain very rugged terrain characterized by narrow canyon bottoms, steep canyon sides, cliff faces and wooded ridge tops. The country is typical of that inhabited by the prehistoric Mogollon culture of southwestern New Mexico and east-central Arizona. Archeologists generally include the Gila forks area in the extreme northern edge of the Mimbres branch of the Mogollon, but the area also is near the southern edge of the Cibola branch. Evidence of both subcultures of the Mogollon is found within the Gila Cliff Dwellings vicinity. The term "Gila forks" denotes in this text the Gila River headwaters area where the three forks of the river converge (Figure 3). This distinguishes it from the term "Upper Gila" used by other archeologists for the area downstream in the Cliff-Gila section of the river.

Don Morris conducted a survey of the monument lands and an area one mile in radius around the visitor center in the fall of 1968, which resulted in the location of 98 sites. This early survey added much to archeologists knowledge of sites within this area of the Gila River. However, standardized site forms were not completed for all sites during this survey, and Morris never reported or interpreted the artifact analysis conducted after the fieldwork. Morris (1968a) did submit a preliminary report on the fieldwork for the files, which was subsequently printed as a chapter in the report on Gila Cliff Dwellings by Anderson et al. (1986:13-19). Nevertheless, a resurvey of the monument lands was needed to update site information, standardize the documentation, complete the artifact analyses, interpret the results and discuss them in a final report for the GMP revision.

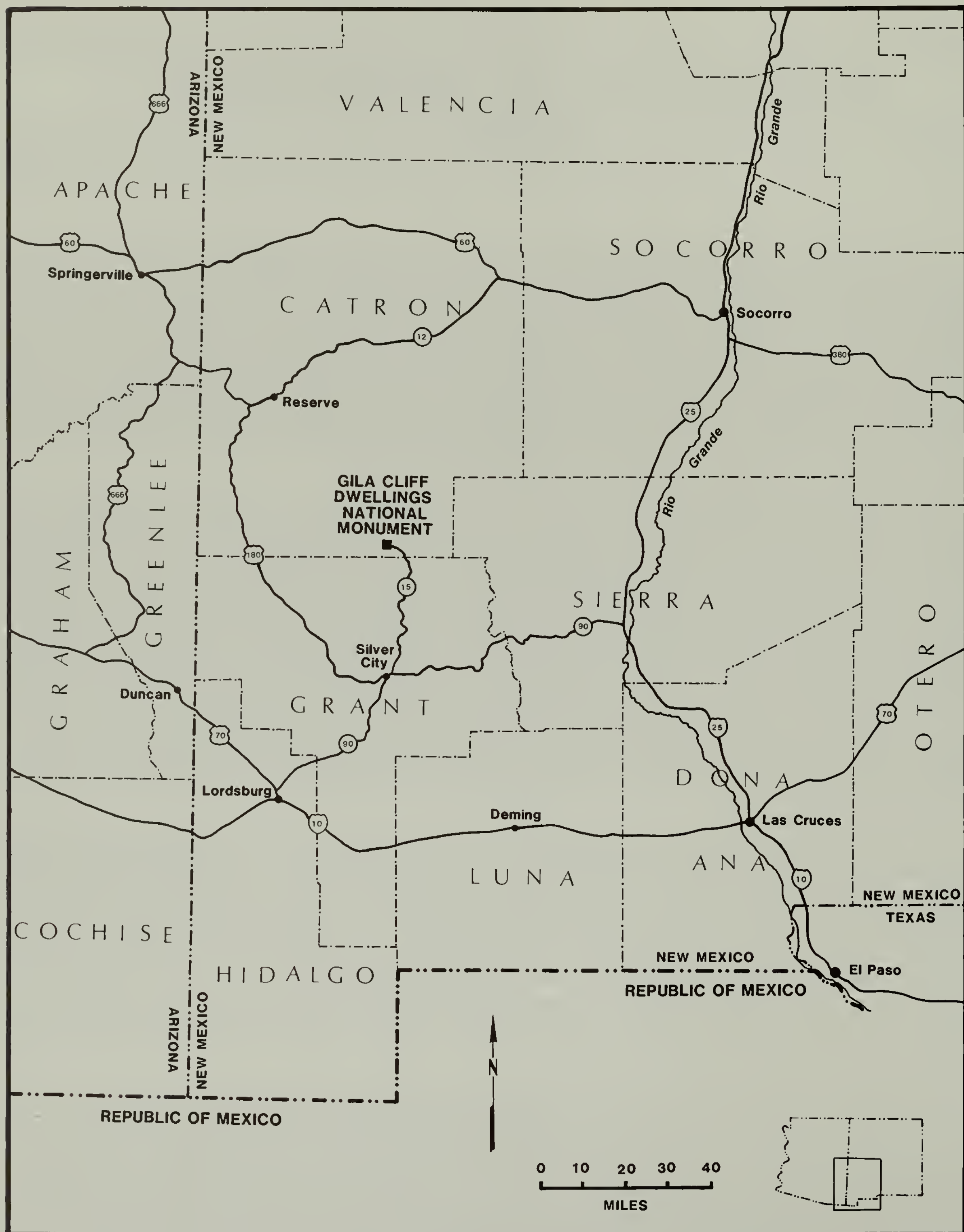
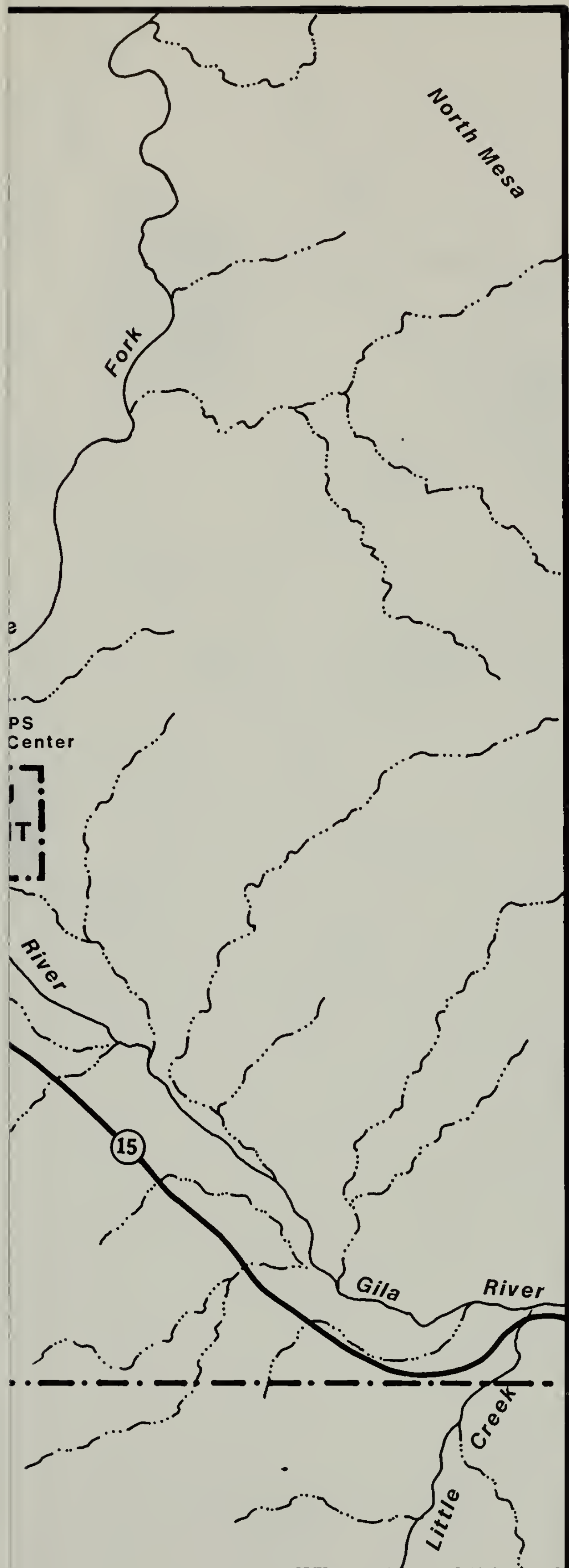


FIGURE 1: Map Showing the Location of Gila Cliff Dwellings National Monument in Southwestern New Mexico.



Map of Gila Cliff Dwellings National Monument.

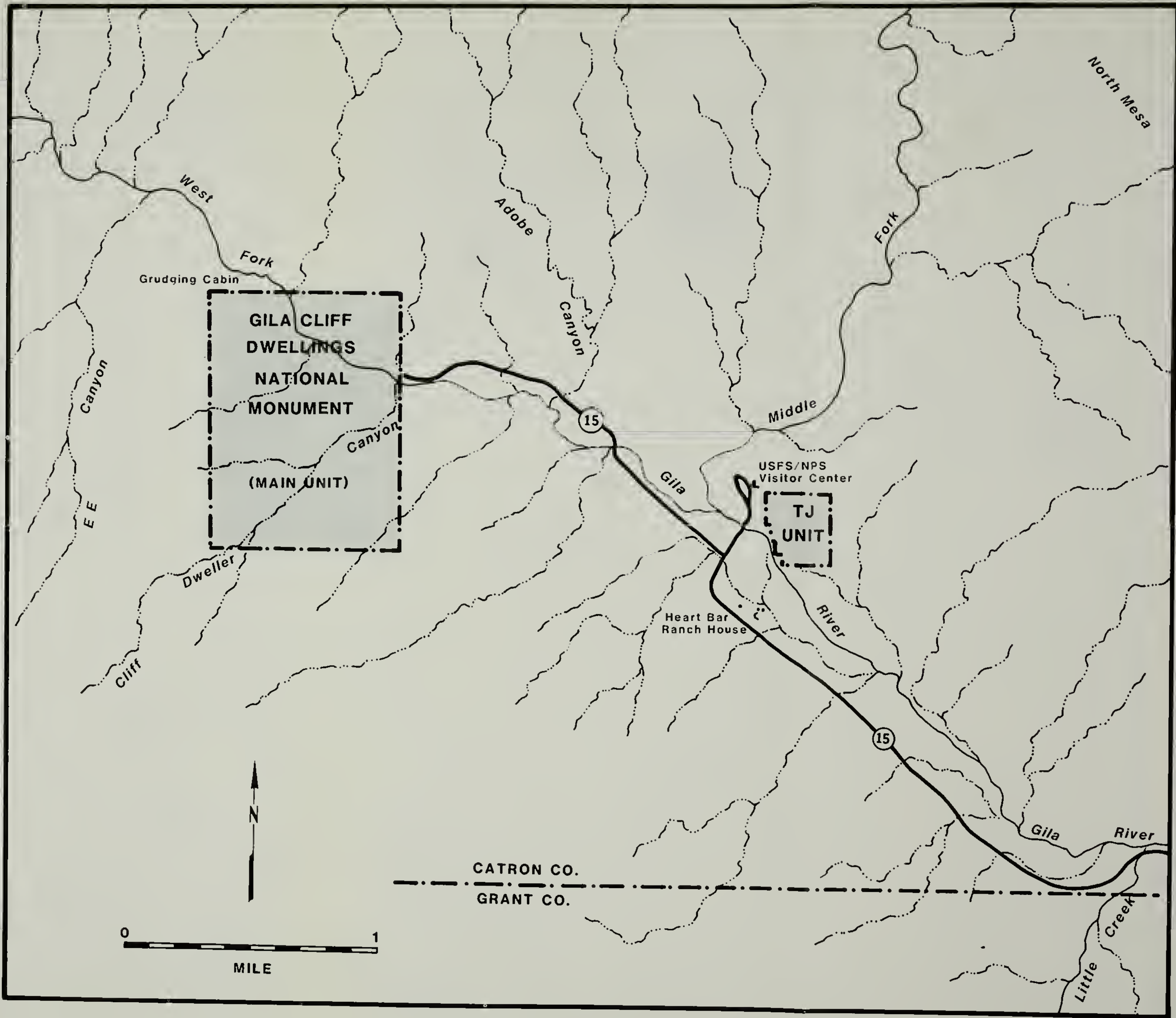


FIGURE 2: Map of Gila Cliff Dwellings National Monument.

Standardized documentation at each archeological site included 1) any previous information known about the site, 2) cultural affiliation(s) and time period(s) exhibited by the site, 3) location information relative to modern and geographical features, 4) environmental data pertinent to the site and its location, 5) a description of all site materials, including architecture, nonarchitectural features, artifact types, modern material culture, inferred activities and a summary site description, 6) resource management information on types of disturbance, management recommendations and site significance, and 7) a measured plan map of the site and its immediate surroundings. All sites were plotted on both USGS 7.5 minute quad maps and 1:2400 scale aerial photographs. In-field analysis was conducted on surface artifacts of chipped stone, groundstone and ceramics. Recording also included black-and-white prints and color slide photography.

In addition to the above, information for each site was acquired for a study of the Gila forks prehistory. Although some archeological work has been conducted in the Gila forks area in past years, much of it was reconnaissance, specific to only one or two sites, the information never written in more than preliminary fashion, or a combination of these. Thus, even a discrete piece of land in the immediate Gila forks area had never been intensively surveyed and compared to other areas within the Mimbres or Cibola subregions of the Mogollon culture.

Several limitations were encountered during the project. In the field, the nature of the investigation itself presented two major limiting factors: 1) the survey involved the inspection of surface manifestations only, which affects conclusions about site type, chronology and function, and; 2) within this framework, only surface artifacts were available to address questions of cultural affiliation, site function and chronology. Other factors influencing results of the fieldwork were minor, including extremely rough terrain, wooded acreage and reduced ground visibility, and, to a lesser extent, weather and flooding.

Results of the study were heartening, although one always wishes for more. Within the monument boundaries, 45 archeological sites were recorded. Of these, 35 were noted in previous surveys of the general area, while this project added another 10 sites to the inventory. The 45 sites have been classified into six site categories, including pithouse sites, pithouse/pueblo sites, pueblo sites, rockshelters, artifact scatters and specialized sites. Different combinations of these types sometimes occur at the same site (e.g., rockshelter and pueblo), and certain categories can be broken down into more specific site types (e.g., pueblos into fieldhouses, small pueblos and large pueblos).

The project also acquired information on surface artifacts at each site. The ceramic data aided in establishing a chronological framework for most of the sites, although this is limited somewhat by the ceramic types involved. Lithic artifacts provided some data on available lithic types and use by prehistoric inhabitants as well as the types of stone tools manufactured at certain sites. Further, 27 Isolated Occurrences or IOs (that is, one to 10 artifacts located outside any established site boundaries which themselves do not warrant site status) were located, providing a more complete picture of the prehistoric use of monument lands. The artifact collection from the 1968 survey by Don Morris also was reanalyzed and incorporated into the results of this project.

More complete and accurate site boundaries also were obtained for each site, which will provide better information when discussions about where cultural resources exist within the monument and how each can be managed, interpreted and protected take place. Finally, the efforts of this investigation not only brought the knowledge about these 45 sites up to date, but also provided more information on each and standardized the level of documentation for all of them.

With the above in mind, the fieldwork for this project began on September 6, 1988 and continued, in two 10-day sessions, until September 29. During this period, approximately 410 acres of the monument were surveyed, including the TJ Unit. Twenty archeological sites were documented, including six previously unknown sites. Three people made up the survey crew during this month. The final session of fieldwork was conducted between March 28 and April 5, 1989 with a four-person crew. The remaining 123 acres were surveyed with an additional 23 archeological sites documented. Two more sites, noted but not fully recorded during the spring session, were added to the inventory during a short trip to the monument in June 1989. In all, 100 person-days were spent completing the fieldwork (including travel and orientation).

A second result of this project is that the entire area of the monument has been intensively surveyed and the prehistoric data base increased as a result. Information from sites located outside the monument, but in the immediate Gila forks region, is incorporated into this study. The combination of these two data sets provides baseline information for the immediate area of the Gila forks region, allowing for comparisons to the surrounding area and other subareas of the general Mogollon region, particularly the Mimbres and Cibola subregions.

All artifacts collected during this project are curated at the Western Archeological and Conservation Center (WACC) in Tucson, Arizona under GICL Accession Number 308 and SWRO Accession Number 196. The previous collection made by Don Morris in 1968 is currently curated at WACC under GICL Accession Number 299 (WACC Accession Number 482).

ENVIRONMENT

For purposes of this report, the discussion on the environment will include the Gila Wilderness Area in general, and the Gila forks vicinity in particular. The Gila Wilderness is part of the larger Mogollon highlands or plateau situated north of Silver City and east of the Arizona/New Mexico state line (Figure 4). This area is part of the Datil-Mogollon section, a volcanic region transitional between the Colorado Plateau to the north and the Basin Range Province to the south. The wilderness includes the mountainous areas surrounding the headwaters of the Gila River, dominated on the south by the Mogollon Mountains and on the northwest by Mogollon Baldy and Whitewater Baldy peaks. Elevations in this region range from a low of 1448 m (4750 ft) near the confluence of Mogollon Creek and the Gila River to 3328 m (10,892 ft) at the crest of Whitewater Baldy near the headwaters of the West Fork of the Gila River. The Continental Divide skirts the eastern boundary of the Wilderness Area.

GEOLOGY

The geology of southwestern New Mexico is extremely complex, particularly within the mountainous region of the Mogollon Plateau that characterizes this section of the state. Although rocks of the Paleozoic and early Mesozoic Eras exist in scattered parts of the region, few occur within the Gila forks area because later geologic activities obscured or replaced them. The earliest, still extant, evidence of geological effects on the area are the mountainous geologic structures that "date mainly from the Laramide orogeny of Late Cretaceous and early Tertiary age, during which widespread faulting and folding, and igneous intrusion and volcanism took place throughout the Cordilleran region of the western United States. These events were followed by renewed volcanism and subsequent tensional faulting during the development of the Basin and Range structural province starting in middle Tertiary time" (Ratté et al. 1979:16). During this period, southwestern New Mexico experienced earthquakes, uplifting and massive volcanic activity, followed by a geologically short period of erosion (Clemons et al. 1980:19).

Geologic activity during the subsequent Cenezoic Era formed the basis of the southwest New Mexico landscape as we know it today. Between 38 and 26 million years ago, southwest New Mexico exploded with a renewed period of volcanic activity. On the elevated base of late Mesozoic rock, "andesitic volcanoes erupted immense quantities of lava along with dust-size to huge-boulder-size fragments" (Clemons et al. 1980:19-20). Following this, was another short period of erosion, followed by an even more violent surge of volcanic eruptions depositing massive layers of rhyolitic ash-flow tuffs across hundreds of square miles of land, creating the massive Datil-Mogollon volcanic area.

A later series of eruptions deposited large amounts of andesite and basalt in the area just south and east of what is now the Gila forks area. Along with this volcanic episode, another series of earthquakes began altering the regional landscape. Faulting created massive movements of land blocks, resulting in the north to northwesterly-trending mountain ranges. Concomitant with the uplift and faulting, the new mountain blocks eroded with resultant deposits of clays, sands and gravels concentrating in lower areas, thus providing materials for what would become the Gila Conglomerate (Clemons et al. 1980:20).

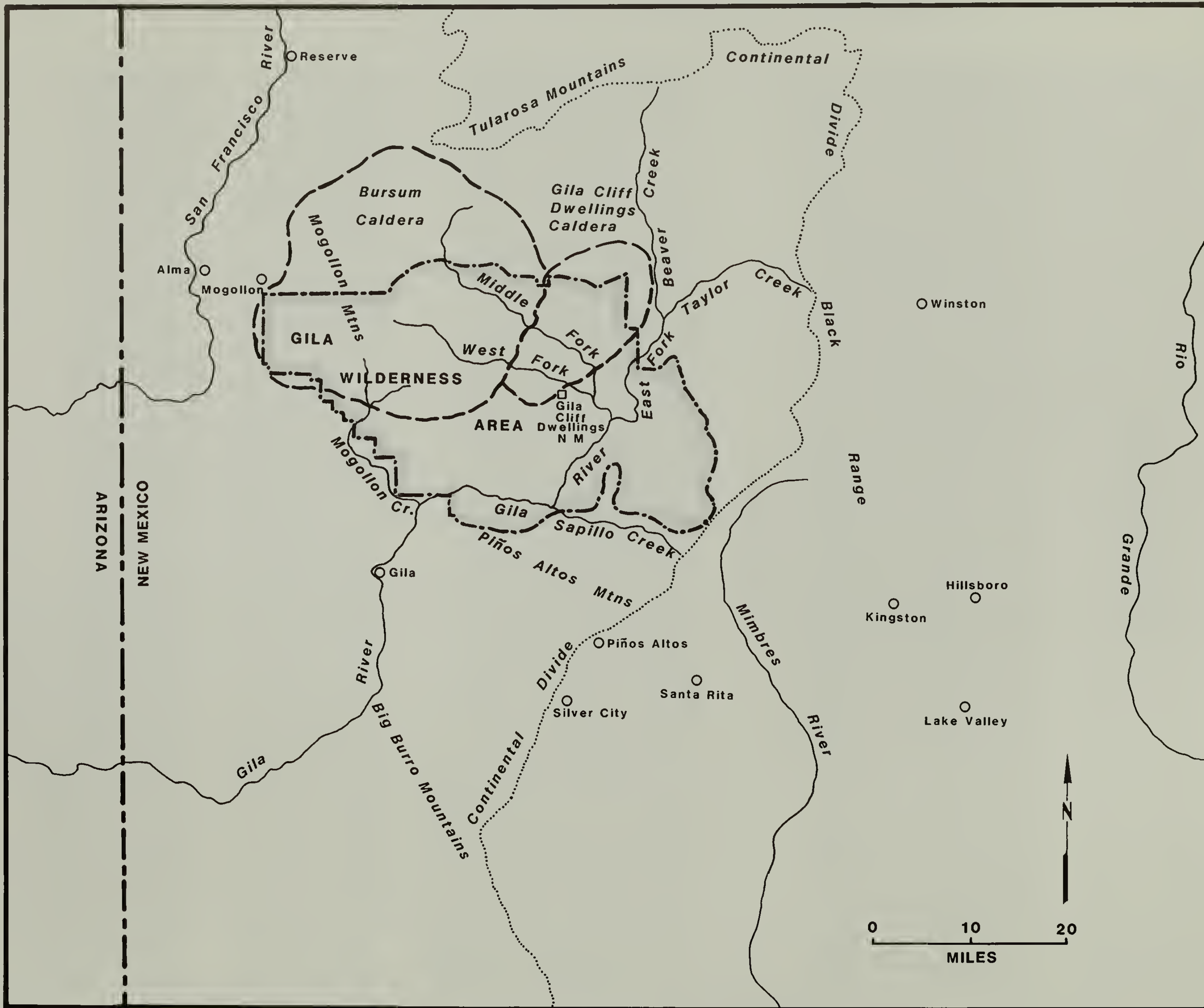


FIGURE 4: Geographical Map of the Gila Wilderness Area.

The final geological episodes occurred between 2 million and 10,000 years ago during the Pleistocene Epoch. Continental ice sheets advanced and retreated across North America, with smaller glaciers occurring as far south as Sierra Blanca near present-day Ruidoso. The resultant river and drainages created from melting ice formed the ancestral Rio Grande, which became entrenched in its present valley about 400,000 years ago. The Gila and Mimbres Rivers have similar histories (Clemons et al. 1980:22). The Gila River, after cutting through the volcanic rocks of the Mogollon Plateau, drained westward into what is now southeastern Arizona, collecting in the "Gila Low", a series of interconnected closed basins and ranges of varying depths (Peirce 1974:48, 1984:215). Here, because the terminus was undrained for thousands of years, thick accumulations of alluvial deposits built up before the ancestral Gila River broke through the western edge, forming its course toward the southwest and the Colorado River. For the Mimbres River, the drainage is small, and, unlike the Gila River of today, the river trends southward to drain into the closed basin of southeastern Luna County.

LOCAL GEOLOGY AND TOPOGRAPHY

The geology described above forms the basis of the local geology in the Gila Wilderness Area. Volcanic activity, primarily from 26 to 20 million years ago, created a mosaic of extrusive rock types intertwined with some sedimentary types. Many of the local volcanic rocks originated from the Gila Cliff Dwelling caldera, a 16-kilometer (10 mi) wide collapsed caldera centered in the upper reaches of the West Fork immediately north of the Gila Cliff Dwellings (Figure 4). This caldera, along with the much larger Bursum caldera to the northwest, extruded a series of volcanic rocks, including massive deposits of rhyolitic ash-flow tuffs and andesitic lava flows. In particular, the Bloodgood Canyon Rhyolite Tuff characterizes the upper reaches of the Gila forks area. "This densely welded tuff is exposed in spectacular columnar-jointed cliffs in the canyons of the West and Middle Forks of the Gila River" (Ratté et al. 1979:25).

Sedimentary rock in the Gila forks area is primarily Gila Conglomerate, a "fine to coarse bouldery conglomerate that can be correlated with a local source [and] is several hundred feet thick along the East and West Forks of the Gila River" (Ratté et al. 1979:30). The Gila Conglomerate formed when volcanic ash and rock debris washed off the surrounding mountains, collecting in the lower drainages. The combination of mud, sand and gravel then cemented together, primarily with calcium carbonate (Corder 1988).

In the immediate vicinity of the Gila Cliff Dwellings, there are three major rock formations: 1) the white basal unit of the Last Chance Andesite, exposed in the very bottom of the West Fork drainage; 2) the Bloodgood Canyon Rhyolite Tuff immediately overlying the Last Chance Andesite, and; 3) overlying the tuff, the Gila Conglomerate in which the cliff dwellings are built. Near TJ Ruin, because of faulting, the primary rock type is Gila Conglomerate with surrounding exposures of Bloodgood Canyon Rhyolite Tuff. "Pediment gravels and minor other recent alluvial deposits" (Ratté et al. 1979:30) also lay exposed in the stream bottoms and in the immediate vicinity of TJ Ruin.

Following the deposition of the above rock types, the major influence on the local topography has been faulting both within and across the Gila Hot Springs Graben (Ratté et al. 1979:41, Plate 1). Here, the West Fork of the Gila River follows the general northwest-southeast direction of the faults within the graben, and many smaller fault lines crosscut the canyon sides in the vicinity of Gila Hot Springs. Particularly good evidence of the graben is visible between the county line and TJ Ruin where Gila conglomerate ridges on the west side of the canyon have been truncated and down-thrown. The active faulting in the area facilitated the formation of the major drainages forming the headwaters of the Gila River, the West, Middle and East Forks and their attendant side drainages.

Ratté et al. (1979:9) describe the terrain in this region as rising "to broad flat divides at 7,500-8,500 feet along the West and Middle Forks of the Gila, and less than 7,000 feet along the East Fork and southward to Sapillo Creek" and "a plateaulike area of relatively subdued topography". However, the Gila River headwaters have cut spectacular canyons into the raised landmass and the micro-topography within the immediate vicinity of the Gila forks is rough, rugged terrain with narrow canyon floors, steep canyon walls and sheer cliffs climbing to moderately flat ridge tops. Canyon bottoms often are only several feet wide but broaden to an unusually wide valley of 0.8 km (0.5 mi) in the immediate area of the West and Middle forks confluence. Faulting and down-cutting from the river resulted in very steep canyon walls and sheer cliffs on both sides of the major drainages. Within the main unit of the monument, total relief exceeds 1,585 m (520 ft), with cliffs of up to 609 m (200 ft) not uncommon.

Due to the nature of the Gila Conglomerate, the primary rock unit within the main monument parcel, many cavities, rock overhangs and caves formed, inviting use by prehistoric peoples. The talus slopes generally are too steep and the canyon bottoms too narrow to afford much use by man. The ridge tops, however, often provide crests or flat necks wide enough to locate small pueblos and pithouse villages where the terrain slopes gently toward the more extreme drop-offs of the upper canyon walls. In the vicinity of the TJ Ruin, just downstream from the confluence of the West and Middle forks, topography is less extreme on the east side of the river. Sharp slopes are not uncommon but sheer cliff faces do not occur in the immediate vicinity of the site; they do occur, however, within 0.8 km (0.5 mi) both upstream and downstream from this locale.

The combination of the all of the above rock types resulted in many lithic resources for prehistoric inhabitant use. Most of the exposed rock consists of rhyolite, rhyolitic welded tuff, and andesite and andesitic welded tuff, all of which are quite workable materials well-suited for manufacturing cutting and piercing tools. Small obsidian nodules are locally available, having been found on ridge tops and in the riverbed gravels (Cosgrove 1947:20,62-63; Hammack 1966:2-3; this survey). The Mule Creek obsidian source area, about 67 km (42 mi) west of the cliff dwellings, has been the traditionally held source for this region (Findlow and Bologuese 1982:299-300).

Additionally, similar material types were available within a reasonable distance of the Gila forks area. Such common workable lithic materials as chalcedony, chert, agate and quartzite were obviously available within the general region, as chipping debris from these types of stone was found on most archeological sites during this survey. The west slope of the Black Range, about 48 km (30 mi) east, has exposures of the Magdalena and Lake Valley limestones, both of which contain lenses and nodules of white, gray and black chert as well as small exposures of siltstones and shales (Kuellmer 1954:20-24, Figure 4). Small amounts of chalcedony also occur on the west slopes of the Black Range, in the Taylor Creek area at the headwaters of the Middle Fork of the Gila River, as reported by Harley (1934:70). Weber (1985:95-96) describes similar sources of silica materials in the gravels along Duck Creek, Mogollon Creek and the Gila River within 80 km (50 mi) to the southwest. Cobbles collected from the gravels as well as undressed stone from the Gila conglomerate and andesite formations provide a ready source of building material for standing structures as well as adequate supplies of stone for crushing and grinding tools used in processing foodstuffs. Although not directly tied into the local prehistoric ceramic manufacturing industry, kaolin clays occur on the west slopes of the Black Range (Harley 1934:70) and one of the few sources of sepiolite (meerschaum) known in the western hemisphere comes from south of Gila Hot Springs on Sapillo Creek (Clemons et al. 1980:94)

HYDROLOGY

Because of its elevated topography and position in regional climatic patterns, the Mogollon Plateau is the primary water source for the extreme western boundary of the state. In the immediate vicinity of the wilderness area, "drainage off the crest of the Mogollon Mountains shows a radial pattern centered on Whitewater Baldy and is related to the geologic structure of the Bursum caldera" (Ratté et al. 1979:9). The smaller Gila Cliff Dwellings caldera creates a similar pattern in the immediate area of Gila forks with drainage moving primarily from north to east to southwest with the Gila River being the primary conduit. The three forks of the Gila River, with a few of its major tributaries downstream, are the only perennial streams in the area. The Gila River is, however, "an erratic, silt-laden stream whose flows fluctuate widely both seasonally and annually. High volume flows from snowmelt and intensive summer rains produce flood damage and deposit silt" along the course of the river (NMSPO 1967:246).

The Gila conglomerate is the primary aquifer of the region. However, the aquifer is highly variable across the area, and is "above the water table along most of the Middle Fork" (Ratté et al. 1979:98). Where it occurs as an aquifer, it generally yields 1 to 500 gallons of fresh water per minute depending on the rock consolidation. Rhyolites and basalts are locally interbedded with the Gila Conglomerate along with minor occurrences of andesite flows and breccias. These strata bear local water and can yield between one half and 10 gallons per minute of fairly fresh water, although they may contain high concentrations of fluoride (NMSPO 1967:Table 48). Stream valley alluvium in the major drainage bottoms generally is poorly sorted locally derived clay, silt, sand and gravel, not well cemented (NMSPO 1967:215). All major streams and tributaries of the area are subject to flooding and the alluvial reservoirs of the Gila are stream connected; that is, recharge is directly dependent on precipitation that falls within the drainage area. In the immediate vicinity, aside from exposure in the perennial streams, depth to groundwater is over 152 m (500 ft). However, a few perennial streams, springs and seeps occur within the Gila forks locale.

Almost all rock formations in the area yield some water. During wet weather, the contact joints between the rhyolites and andesites, where exposed, produce numerous seeps of varying amounts of water. Seeps also occur throughout various faults and cracks within the Gila conglomerate during such periods.

Due to the extensive faulting of the Gila forks area, and the relative proximity of underground geothermal sources, several thermal springs occur: one is about 0.8 km (0.5 mi) upstream on the Middle Fork; six are at Gila Hot Springs, two are just south of the confluence of the West and East forks, and three are along the upper Middle Fork (Ratté et al. 1979:98: Plate 1). These waters range in temperature from 32-65° C (90-150° F) and have drawn man into the upper Gila region throughout history and, undoubtedly, prehistory.

SOILS

No one has intensively studied or mapped soils of the Gila forks region. Maker et al. (1974:127-128) classify the soils of this region in the Haplustolls-Argiustolls-Rock Land soil association. This association is the largest in the mountainous region of Catron and Grant counties and consists of gravelly or stony shallow soils developing from mixed igneous and conglomerate rocks. Haplustolls are typically grayish brown to brown, neutral to slightly acid, and exhibit cobbly or stony surface layers. Subsurface layers consist of loams or light clay loams, containing moderate to high contents of gravel, cobble and stones. These soils are usually underlain by bedrock within 51 cm (20 in) of the surface. Argiustolls are very similar to Haplustolls except they tend toward clayey subsoils. They have a thin brown noncalcareous cobbly loam surface layer over a brown to dark reddish brown clay or gravelly clay subsoil. Igneous bedrock or conglomerate typically occurs within 51 cm (20 in) of the surface. Rock Land, characterized by numerous outcrops of bedrock that usually occur on steep to very steep slopes, consists of a complex of rock outcrops and shallow soils with variable characteristics. The shallow soils are generally gravelly or stony and moderately coarse to medium textured, with stones and boulders on much of the soil surface. Small areas of moderately deep soils also occur (Maker et al. 1974:128).

Where deeper soils develop, they tend to be "leached, well developed, and acidic because precipitation is relatively high, temperatures are low, and the dominant vegetation is coniferous trees, which are best suited to the climatic and soil conditions" (Maker and Dougherty 1986:65). However, topography greatly affects soil depths in these mountainous regions and erosion is a constant threat. When located on steep mountain slopes, thin eroded soil is commonplace. Redeposition of these soils into the drainage bottoms then occurs, resulting, in many locations, in small to moderate-size terraces of gravelly soils along the watered canyon bottoms. In these locations prehistoric agriculture would have been most feasible as well as on the wider ridge tops where soils could form and be retained.

CLIMATE

Precipitation in the region is primarily determined by the seasonal weather patterns of the Southwest and locally by terrain. Polar maritime air masses in the winter months push storms out of the Pacific Northwest and into the rest of the United States. In southwestern New Mexico, these storms bring precipitation in the form of snow in the higher elevations and rain in the lower regions. Summer storms generally originate in the Gulf of Mexico, push inland, and circulate storm clouds across the state, usually entering to the southwest. In both cases, local topography and elevation play a part in the distribution of precipitation. As a result, the Mogollon Plateau is one of two areas in the state classified as having moderate annual precipitation; that is, between 30 and 43 cm (12 and 17 in) annually (Tuan et al. 1973:19).

The extreme elevations of the Wilderness Area qualify as "humid". Humid areas are "those of higher elevation which retain the snows of winter and rains of summer for slower release through the year. [Unlike the surrounding areas of slightly lower elevation...] These areas have more precipitation than can be evaporated or used by forests" (Tuan et al. 1973:194); in this area this results in an annual precipitation of 50 to 76 cm (20 to 30 in) in the highest elevations.

Compared to the rest of New Mexico, the southwest sector exhibits a more pronounced precipitation peak in August rather than in July, and May is the driest month compared to June for the rest of the state. Through the winter (December-February) the average precipitation is 10 cm (4 in); average spring (March-May) precipitation falls to 6 cm (2.5 in); summer precipitation, with the highest amount, reaches 17 cm (7 in) between June and August; and fall matches winter with 10 cm (4 in) between September and November (Taun et al. 1973:Figures 9-12).

Because many local factors influence temperatures across any given area, this category must be discussed in general terms. Elevation and latitude generally affect temperatures across the Mogollon Plateau, but on microlevels slope orientation, soil types, wetness/dryness of ground, color of ground and cold air drainage also influence temperatures (Bennett 1986:37-39).

In general, temperature patterns in the Gila forks area are consistent with the rest of the state; that is, the warmest month is July and the coldest month is usually January. Average regional temperatures can range from a high of 26° C (80° F) in summer to an average low of -9° C (15° F) in winter (Bennett 1986:34-35), although local factors can cause regional variations. Average annual temperature is around 10° C (51° F).

An important factor to consider for this mountain valley environment is air movement. "A narrow canyon, by channeling air movement, creates its own temperature regime" (Taun et al. 1973:69). In the mountains, a shift in wind direction may cause a sharp rise in nighttime temperatures, thus providing more favorable growing conditions. Such a phenomenon may have been a positive factor in the Gila forks area (McKenna and Bradford 1989:5). The number of frost free days for the region is between 120 and 140 days, with frost occurring as late as May and as early as September in the higher regions (Taun et al. 1973:86 and Figures 38-40).

BIOLOGICAL RESOURCES

FLORAL COMMUNITIES

As is true of biotic communities everywhere, the local vegetative patterns of the region are primarily influenced by the regional geology, topography and climate. According to Martin (1986:67-69), the Gila forks area contains three major vegetative communities, coniferous woodland, mixed conifer and riparian.

The coniferous woodland community is primarily on the east side of the Gila River, mostly at elevations of 1,676 to 2,134 m (5,500 to 7,000 ft) (Figure 5). However, it does blend with the mixed conifer community at higher elevations. "The general aspect of the coniferous woodland is that of an open stand of the dominant conifers interspersed with species of grasses and a few forbs in the open areas. Herbaceous plants may be numerous, depending on edaphic factors and elevation [and] oak may be dispersed throughout the association" (Martin 1986:67). Vegetation noted for the coniferous woodland primarily includes piñon pine, alligator juniper, one-seed juniper, rocky mountain juniper and some intermixing of ponderosa pine trees. Woody shrubs and plants include Apache plume, cliff rose, mountain mahogany, rabbit brush, narrowleaf and broadleaf yucca and an occasional century plant. Scattered across the terrain are various species of prickly pear, hedgehog cactus and cane cholla. Numerous smaller plants found include rocky mountain beeweed, aster, globe mallow, lupine, dwarf mistletoe and snakeweed. Grasses include blue grama, hairy grama, little bluestem, bush muhly, mesa dropseed and three-awn.

Ponderosa pine with some mixing of piñon and juniper dominate the mixed conifer community (Martin 1986:68-69). Characteristic associations include ponderosa pine and junipers with understories dominated by Gambel oak, gray oak and mountain mahogany (Figure 6). This association occurs primarily west of the Gila River between 1,981 and 2,438 m (6,500 and 8,000 ft) elevation. Many of the same plants occur in this association as in the coniferous woodland. The major difference between the two is in the ratio of tree types. Here, ponderosa pine dominates instead of piñon pine.

The riparian zone "is confined to a relatively narrow band adjacent to water courses and is most apparent along major streams" (Martin 1986:67). This zone is best represented in the vicinity of the confluence of West Fork and Cliff Dweller Canyon where a wide variety of plants occur in a

FIGURE 5: View Northeast From the Mouth of Cliff Dweller Canyon Showing the General Topography of the Gila Forks Region and the Mixed Conifer Community.

FIGURE 6: View Southwest Across the West Fork Drainage Bottom Showing the Combination of Mixed Conifer and Riparian Communities.

relatively small area (Figure 7). The riparian community has several species of trees including velvet ash, boxelder, chokecherry, Fremont cottonwood, narrowleaf cottonwood, Douglas fir, alligator juniper, one-seed juniper, rocky mountain juniper, Gambel oak, gray oak, piñon pine, ponderosa pine, Arizona sycamore, Arizona walnut, chokecherry, and willow. Shrubs and vines include Apache plume, birch-leaf buckthorn, buffalo gourd, golden currant, canyon grape, ragwort groundsel, mountain mahogany, poison ivy, rabbit brush, squaw bush, Virginia creeper, New Mexico wild olive, wild rose, New Mexico locust, orange gooseberry, broad and narrowleaf yucca and honeysuckle. Cacti include several species of prickly pear, cane cholla and hedgehog. Flowering plants and grasses are numerous and include aster, rocky mountain beeweed, cattail, yellow columbine, cutleaf coneflower, datura, dayflower, evening primrose, four o'clock, geranium, globe mallow, goldensmoke, groundsel, horsemint, milk vetch, lupine, meadow rue, mistletoe, yellow monkeyflower, mullein (Indian tobacco), Indian paintbrush, penstemon, peppergrass, prickly poppy, goatsbeard, snakeweed, stinging nettle, verbena, violet, water hemlock, western wallflower, white sweetclover, fleabane and yarrow.

The variety of the riparian plant community is obvious from even the incomplete list above and reflects the diversity of floral resources available in the immediate area (see Appendix 1). This, along with the surrounding coniferous woodland and mixed conifer communities, would have provided a plethora of usable materials for food, medicinal purposes, decorative paints and dyes, tools, weapons, implements, building materials, firewood, ceremonial objects, etc. All of the plants listed above are known to have been used prehistorically or ethnographically by Southwest Native Americans.

When possible, every part of a plant was used for food, including the bark, fruits, flowers, leaves, roots, seeds, stems, tubers or the entire plant. Medicinal use of plants probably was as important as their use for sustenance. Numerous plants known to occur in the region are usable for both internal and external applications, and undoubtedly saw similar use during ceremonial practices as the occasion required. Ceremonial use of plants would include their use as adornment (such as necklaces, collars, bracelets, belts and wristbands), tools/paraphernalia (wands, arrows, bows), decoration, baths, dance implements, dolls/figurines/images, structures, containers/holders, incense, prayersticks, string/cordage, musical instruments (whistles and rattles), pollen, dyes/paints and costume articles. The painted wooden artifacts found in caves throughout the region (e.g., Cosgrove 1947, Martin et al. 1952) are but a small testimony of the importance of such natural resources to the prehistoric peoples' spiritual lives.

Wild plants occurring in the area yield black, brown, blue, green, red, orange and yellow dyes. Tools and weapons would have been made from plant parts, including such items as bows, arrows, snares, clubs, throwing sticks, gaming pieces, digging sticks, fire drills, hoes, awls/needles, spoons, prayer sticks, weaving tools, basketry and matting. In an architectural context, the heavier woody plants would provide materials for vigas, latillas, lintels, braces, roofing, pegs, walls and wall/pit linings.

Not listed above are some of the more important plants used as they are domesticates and it is very difficult for them to exist without human care. The local environment, however, was conducive to their propagation. As evidenced in the recovered materials from Gila Cliff Dwellings (Adams and Huckell 1986:277-322), these include several varieties of corn (*Zea mays*), three varieties of beans (*Phaseolus vulgaris, P. acutifolius* and *P. metcalfei*), at least four varieties of squash (*Cucurbita sp., C. mixta, C. moschata and C. pepo*), bottle gourd (*Lagenaria siceraria*) and cotton (*Gossypium hirsutum*).

The above discussion provides an idea of how many plant resources occur within the immediate vicinity of the monument and how local inhabitants could have used them. Additionally, each major environmental zone and their econiches also would have an associated faunal community.

FIGURE 7: View Down Cliff Dweller Canyon Showing the Heavily Wooded Confines Typical of the Narrow Canyons in the Region.

FAUNAL COMMUNITIES

With the evolution of the more xeric environment after the Pleistocene Epoch, the trend toward today's floral communities was established and with it the associated faunal communities of the region. As plants are dependent on climate, soil and elevation to effect their associations and communities, the local faunal communities are directly or indirectly dependent on the established floral communities for their patterns of establishment. For approximately the last 10,000 years, the floral and faunal associations of the Mogollon Plateau have remained essentially the same.

Although some animals are quite specific to certain locations, many faunal species of the area tend to occur over all local environmental zones. Many mammals and avifauna, in particular, occur over widespread areas of the wilderness as a result of adaptations to this mountainous region. Amphibians and certain mammals and reptiles that are more water dependent occur only in the more restricted riparian environments.

McFarland (1967:55-56) lists many of the animals known to occupy the general Gila forks region, including several species of avifauna, amphibians, reptiles and mammals. The archeological record adds other animals to this list as evidence of former occurrence and use in the vicinity. In her study of recovered faunal remains from Gila Cliff Dwellings, McKusick (1986:245-272) identified a wide variety of animal species used, or possibly used, by the prehistoric inhabitants of the cliff dwellings. Represented mammals in this sample are solely known by skeletal remains and are reproduced here in Table 1.

Of the animals listed in Table 1, mule deer and bison were the primary meat-yielding animals. Mule deer remains are much more numerous in the sample and probably yielded as much as 46 percent of the total meat produced, while bison, although not numerous in individual numbers, would have a high meat yield of almost 39 percent of the total at this site. Elk, white-tailed deer and pronghorn antelope would have constituted another 10 percent of the meat produced, resulting in these five mammal species providing 96 percent of the meat during the occupation of the cliff dwellings (McKusick 1986:Table 15.6).

Mule deer minimum faunal counts were exceeded only by those of rabbits which, although requiring more animals for the return, would have been important food sources and supplemented the prehistoric diet year-round. Based on the above counts, and because jackrabbits survive better in overgrazed environments and cottontails do not, the implication is that during the occupation of the cliff dwellings, the local vegetation was sufficient to support the area grazing populations (McKusick 1986:254).

McFarland (1967:55-56) recorded at least 95 species of birds and fowl in the area, including three species of duck, one of dove, and one of turkey; all edible species. In addition, McKusick (1986:246) identifies other species of importance including Mearns' quail, thick-billed parrot and scarlet macaw. Of the latter two species, the scarlet macaw was imported prehistorically from the tropical Mexican lowlands while the thick-billed parrot previously existed in what is now extreme southern New Mexico and Arizona (McKusick 1986:251). Most of the remaining species are songbirds, scavengers or raptors; important sources of feathers for decorative, hunting and ceremonial uses. In fact, most of the evidence for avian fauna at the cliff dwellings was from feathers rather than skeletal remains. Certain species of birds or fowl would have been available seasonally, such as the mallards and mergansers in the winter months and the teal and quail in the spring/summer. Many species would have been available year-round but many probably were hunted at particular times of the year to maximize the amount of meat and fat.

TABLE 1: List of Mammal Remains from Gila Cliff Dwellings (from McKusick 1986).

COMMON NAME	MNI*	COMMENTS
Antelope, Pronghorn	8	known in general area
Bison	26	probably moved into valleys in winter
Bear, Black	1	somewhat common in area
Bear, Grizzly	1	now extinct in area
Beaver	7	formally numerous, now localized
Chipmunk, Cliff	1	common in area
Coyote/Dog	5	numerous throughout history
Deer, Mule	142	most numerous remains found
Deer, White-tailed	22	less numerous than mule deer
Elk	5	once extinct, reintroduced in 1954
Fox, Grey	13	common in area
Gopher, Valley Pockett	29	common in area
Jackrabbit, Black-tailed	37	predominant in overgrazed environments
Marmot, Yellow-bellied	4	occurs in lush vegetation zones
Mountain Lion	1	somewhat rare in area
Muskrat	6	semi-dependent on beaver ponds
Prairie Dog, Black-tailed	1	now extinct in area
Rabbit, Desert Cottontail	146	common in nonovergrazed environments
Raccoon	4	occur near water
Ringtail	1	occur near water
Squirrel, Abert's	1	common in area
Squirrel, Rock	18	do well near human habitation
Woodrat, White-throated	22	common in rockshelters

*MNI = minimum number of individuals counted in sample

Compared to evidence of mammals and birds, fish, reptiles and amphibians apparently did not play a large part in the diet and daily lives of the prehistoric inhabitants. This apparent difference, however, probably is more a factor of such remains not being as well preserved in archeological sites or, more likely, not generally being recognized and recovered from sites archeologically. A possible toad bone and fragments of a turtle carapace were recovered from the Gila Cliff Dwellings (McKusick 1986:245) and fish bones were recovered from Mimbres sites to the south (Anyon and LeBlanc 1984:22; Nelson and LeBlanc 1986:Table 13.1). Stronger evidence for their being an integral part of the Mimbres world comes from depictions of such species on Mimbres Classic bowls. Brody (1977:179) provides evidence for fish appearing on 11 percent, and amphibians and reptiles appearing on 8 percent of the Mimbres bowls in his study. Additionally, Jett and Moyle (1986:688-720) offer a convincing argument for the importance of fish in Mimbres daily life, as described in their study of Mimbres Classic bowls.

The above discussion provides information on the natural resources of the Gila forks region that were available to the prehistoric occupants. The geologic resources are complex and afford several rock types quite usable as stone tools, building materials, processing tools and shelter. The combination of the geologic base, elevation and climate resulted in the evolution of a diversified floral community, providing numerous edible and usable plant species within the riparian and highland zones. All of the above factors combined to influence the faunal species inhabiting the region and on which the prehistoric peoples depended for sustenance and spiritual and secular needs. With such resources available, and an adequate level of technology to exploit those resources, prehistoric man was able to move into the Gila Wilderness region and establish a record of occupation of perhaps two thousand years.

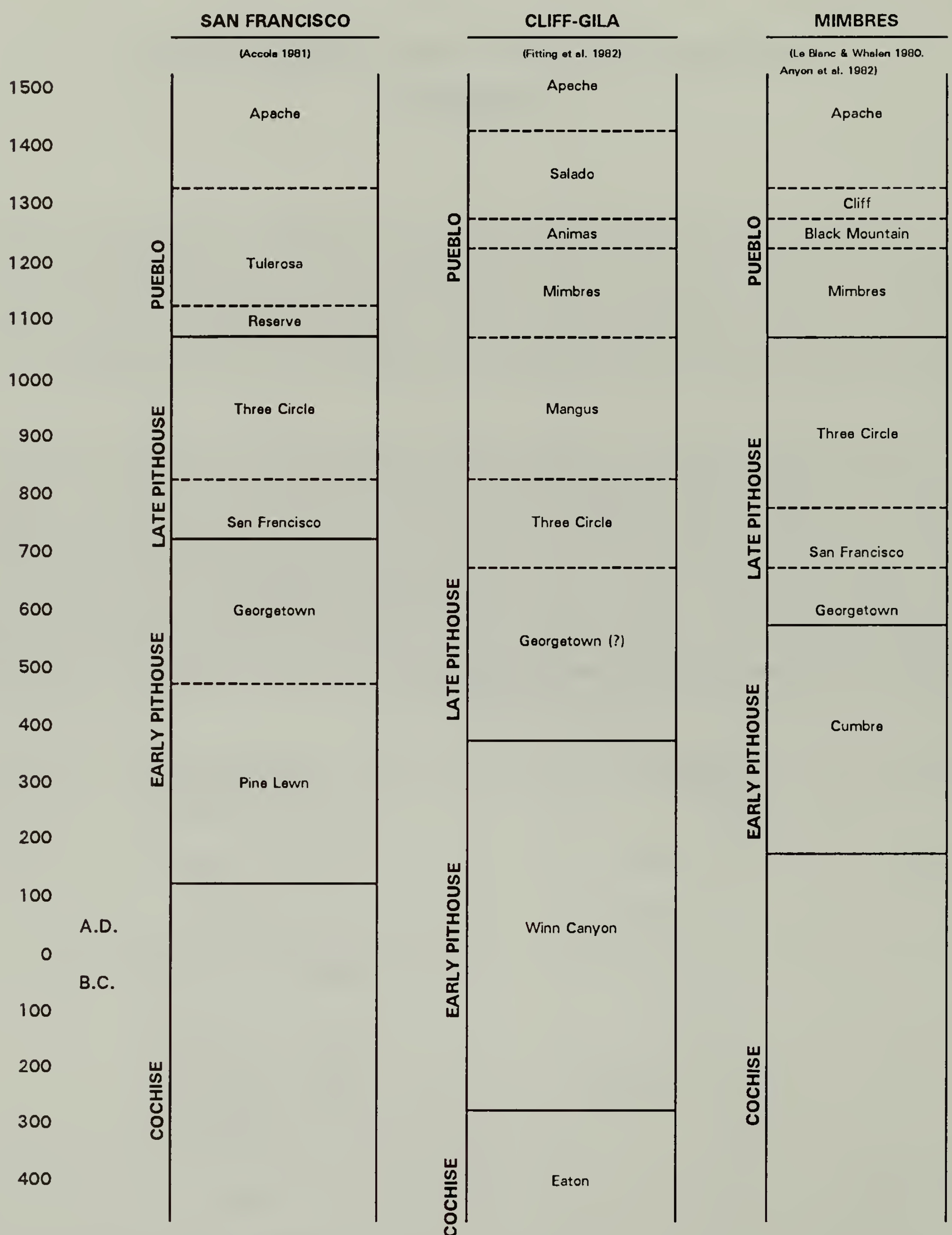
PREHISTORY OF THE UPPER GILA REGION

The prehistory of the upper Gila region is of great significance in the mosaic of Southwest traditions. The prehistoric Mogollon culture that occupied the region for several centuries climaxed in one of the most unique ceramic traditions known in North America. The predecessors of that tradition, and those who followed them, represent a long line of prehistoric development in the multifaceted evolution of Southwest prehistoric peoples. This chapter will review the highlights of these occupational periods and form a framework within which to place the information gathered during this survey.

Lekson (1989:E-2) divides the prehistoric era of southwestern New Mexico into three major culture/time divisions or stages: Paleoindian, Archaic and Ceramic. As depicted in Figure 8, researchers often discuss the Paleoindian stage using the Clovis, Folsom and Plano subperiods. Likewise, the Archaic, or Cochise Culture, is broken down into three subperiods as is the Ceramic stage, which consists of the Early Pithouse Period, the Late Pithouse Period and the Pueblo Period (Lekson 1989:E-3). These, in turn, have smaller divisions termed phases that define more discreet time periods within larger periods. Several phase sequences have been developed for various areas or subregions within the larger Mogollon culture area. For the upper Gila River vicinity, three phase sequences are pertinent (Figure 9). Specific discussion of the cultural sequence in the Gila forks vicinity is found in McKenna and Bradford (1989:6-12).

STAGE	PERIOD	TIME RANGE
	Pueblo	A.D. 1000 - 1400
Ceramic	Late Pithouse	A.D. 550 - 1000
	Early Pithouse	A.D. 200 - 550
	San Pedro	1500 B.C. - A.D. 200
Cochise	Chirichua	3500 - 1500 B.C.
	Sulphur Springs	7000 - 3500 B.C.
	Plano	? - 7000 B.C.
Paleoindian	Folsom	? - ? B.C
	Clovis	10,000 - ? B.C.

FIGURE 8: Prehistoric Cultural Sequence for Southwestern New Mexico.



Solid line seperating phases = major transition. Dotted line = less certain dates of transitions.

FIGURE 9: Cultural Sequences of the San Francisco, Cliff-Gila and Mimbres Subregions.

PALEOINDIAN STAGE (10,000-7000 B.C.)

Aside from a very few sites or isolated finds, primarily in the desert regions, evidence of Paleoindian occupation in the southwest quadrant of New Mexico is almost nonexistent and evidence of Paleoindian use of the mountainous region, including the Gila forks vicinity, is even rarer. One explanation is that evidence of Paleoindian use does not exist in the mountainous regions because of erosion (Fitting et al. 1982:41-42) but, "Given the reported Paleo-Indian sites from high elevations in other parts of New Mexico, we are not so pessimistic" (Lekson 1989:E-5); such evidence may yet be found. However, for now, no good evidence has been found for Paleoindian occupation in the mountains of southwestern New Mexico during the earlier stages of man's occurrence in the New World.

ARCHAIC/COCHISE STAGE (7000 B.C.-A.D. 200)

Only slightly better known than the preceding period, the Archaic stage appears to reflect a time of shifting environmental conditions and local adaptation to those changes. These environmental shifts, which began in the latter stages of the Paleoindian period, and probably were a contributing factor to the extinction of the megafauna that was a critical part of the Paleoindian diet, changed the general climatological conditions from the earlier wetter regimes to overall drier conditions, much like those of today. The trend that probably occurred is a change from wide-ranging hunting/gathering rounds of the Paleoindian period to a more restricted, deliberate seasonal round during the Archaic period.

Little is known about the Archaic in southwestern New Mexico, particularly the first several thousand years. The earliest period of the Archaic, known in this portion of the Southwest as the Cochise Culture, is the Sulphur Springs period. It dates between 7,000 and 3,500 B.C. (Whalen 1971:67). Some consider this period to be associated with the Paleoindian stage (Chapman et al. 1985:32). The middle period, termed Chiricahua, dates between 3,500 and 1,500 B.C. (Whalen 1971:67). In the Upper Gila area, Chiricahua phase occupations have been found at the Wet Leggett Site (Martin et al. 1949) and Tularosa and Cordova Caves (Martin et al. 1952) near Reserve on the Upper San Francisco drainage. Dick (1965:100) excavated Chiricahua and San Pedro phase levels in Bat Cave some 64 km (40 mi) north of the Gila forks region. The San Pedro phase dates between 1,500 and 200 B.C. (Whalen 1971:67). One aceramic site in the Upper Gila region, the Eaton Site, radiocarbon dates to the latter part of this period (Fitting et al. 1982:28; Hemphill 1983) and another aceramic site, LA29397 excavated by Laumbach (1980:40), dates to the period immediately following the San Pedro phase. The evidence at these sites as well as others excavated by Hammack et al. (1966:14) in the form of shallow pithouses, are suggestive of the beginnings of a more settled or seasonal village life in the Upper Gila region, and evidence of maize is indicative that agriculture was becoming an important part of local subsistence during the latter part of the Archaic stage.

CERAMIC STAGE (A.D. 200-1400)

Various phase sequences have been proposed for areas immediately surrounding the Gila forks region (Figure 9). The early work of Haury (1936a) established the basic Mogollon sequence for southwestern New Mexico and, with the later addition of the Pine Lawn phase to the sequence by Martin (1943:120-122), served as a framework for all subsequent studies. With additional work in the various subareas of the Mogollon region, finer delineations of culture area and time periods were possible. Typical of archeological studies, the various investigators reached many different conclusions about the sequence of events and to when they date. Fitting et al. (1982:29-51) provide a good discussion of these differences and propose their own sequence for the Upper Gila area. The following discussion is based on their work.

EARLY PITHOUSE

The Early Pithouse period is characterized by small shallow ovoid pitstructures and a ceramic assemblage dominated by Alma Plainware with a small percentage of San Francisco Redware. These pithouse villages are numerous in the mountainous region, with site location generally, but not always, on high steep ridges or mesas some distance from water sources. In the Reserve area, about 64 km (40 mi) northwest of the Gila forks region, the basic Mogollon sequence for this period holds up with the addition of a beginning date for the Pine Lawn phase. Based on his work in the middle San Francisco River drainage, Accola (1981:158-161) proposes the Pine Lawn phase begins at A.D. 100 and blends into the subsequent Georgetown phase around A.D. 500, which ends around A.D. 700.

Fitting et al. (1982:36-41) propose the Winn Canyon phase for this same period for the area 48 km (30 mi) southwest of the Gila forks region, in the Cliff-Gila vicinity. Because this phase probably evolved directly out of the Cochise Culture, Fitting et al. (1982:40) propose an earlier beginning date of 300 B.C. with an ending date of A.D. 400. Although no firm evidence for Georgetown phase occupation has been found in the Cliff-Gila district, Fitting et al. (1982:40) believe it exists here and have tentatively placed it in the succeeding Late Pithouse period. For the Mimbres River Valley, about 56 km (35 mi) southeast of the Gila forks, LeBlanc (1980:119-120) suggests the Cumbre phase as the sole cultural entity in the Early Pithouse period. Anyon et al. (1981:214) explain that the Cumbre phase has a geographical connotation rather than a temporal one. Here, the evolution out of the Cochise Culture probably occurred about A.D. 200. In the Mimbres Valley, as in the Cliff-Gila district, the subsequent Georgetown phase probably occurred in the Late Pithouse period beginning about A.D. 550.

LATE PITHOUSE

The hallmarks of the Late Pithouse period include a change to larger more formalized pitstructures, larger sites generally located on the first terrace above major drainages, and the appearance of slipped and/or decorated pottery. Because of more cultural trait changes, especially in ceramics, researchers divided the period into two or three phases, depending on the subarea under discussion.

In the Reserve area, the Early Pithouse Georgetown phase gives way to the San Francisco phase around A.D. 700 and continues into the following Three Circle phase that marks the end of the Late Pithouse period about A.D. 1000 (Accola 1981:159). In the Mimbres Valley, the Georgetown, San Francisco and Three Circle phases are all included in the Late Pithouse period (Anyon 1980:149) and remain definitionally the same as first described by Haury (1936a) for the Mogollon area.

For this period, the Cliff-Gila area causes the most disagreement for archeologists. Fitting et al. (1982:39-40) do not recognize a San Francisco phase or a Georgetown phase in the Upper Gila region, although they do not discount the latter's eventual occurrence. The authors do, however, offer a beginning date for the Late Pithouse period from 150 to 300 years earlier than in the surrounding subregions of the Mogollon. In addition, they see the Late Pithouse phases as progressing from a possible Georgetown phase directly into a short-lived Three Circle phase (A.D. 700-800) and then into the Mangus phase (A.D. 800-1000). Archeologists continue to debate the existence of the Mangus phase, which was first proposed by Gladwin (Gladwin and Gladwin 1934:25). The controversy centers around the evidence used in the basic definition of the phase and the fact that, because the original definition was vague, subsequent archeologists provide various explanations of their own to define the phase. Graybill (1975:81-84) felt that the Mangus phase was not valid in his work in the upper Mimbres River drainage, and Anyon et al. (1981:217-218) outright deny the phase exists "in the Mimbres area". Fitting et al. (1982), Bussey (1972) and Lekson (1978a, 1978b, 1990) all find the Mangus phase useful in the Cliff-Gila area and, by extension, along the Gila River, and imply that the phase may not exist within the San Francisco or Mimbres river valleys. The debate continues.

PUEBLO

Archeologists of the Mogollon area universally agree that changes in the cultural patterns of the region occurred around A.D. 1000, resulting in the designation of new phase sequences during the latter part of the prehistoric period. In general, the prehistoric Mogollones switched from pitstructures to surface pueblos for habitation, and the pottery tradition, continuing out of the earlier styles, became dominated by black-on-white types with a later introduction of polychromes.

RESERVE AREA. In the San Francisco drainage, the Reserve and Tularosa phases, dating from A.D. 1000-1100 and A.D. 1100-1300, mark this period. During the Reserve phase, ceramics and architecture of the area appear heavily influenced by the Anasazi culture to the north, although Mimbres trade wares (especially Mimbres Black-on-White) also occur (Neely 1978; Accola 1981:160). Site density during this phase shows a marked increase over any preceding or succeeding periods (Bluhm 1957; Berman 1979:47; Accola 1981:163). The Tularosa phase in this region reflects the addition of new ceramic types, primarily from the north, and fewer but larger better-built sites sometimes with hundreds of rooms (Berman 1979:55,62). The Tularosa phase continued until sometime between A.D. 1300 and 1350, when occupants abandoned the upper San Francisco drainage, with no further habitation until Apachean groups moved into the area sometime after A.D. 1400.

To the south and east, in both the Mimbres and Cliff-Gila areas, the equivalent of the Reserve phase is represented by the Mimbres phase, a period of unique cultural traits in these more southern subareas. This "Classic Mimbres" period is the most studied period of prehistory in this region. The number of sites of this phase proliferate and cover not only the Mimbres and Gila River valleys, but most of southwestern New Mexico as well (Lekson 1989:E-19). Surface pueblos were built over earlier pithouses on what would become the larger sites of this period. Small pueblos eventually grew into large sites of several roomblocks adding up to as many as 200 or more rooms (LeBlanc 1983:105; Anyon and LeBlanc 1984:97-114; Shafer and Taylor 1986:43-68).

Although the large sites are all located along the major drainages, expansion/use into secondary drainages and upland parks also took place (Laumbach 1982:103-109). Lekson (1989:E-21) describes the distribution of large Mimbres sites within the region as occurring "on the Rio Grande, Animas

Creek, Cameron Creek, the Rio Arenas, the Three Forks area of the uppermost Gila and several other creeks in the mountain-transition zone". Even larger Mimbres sites are found on the Gila (Lekson 1984:68-74). The Mimbres people exploited the major drainages by constructing irrigation canals (Bandelier 1892:357; Kessell 1971:16-19; Herrington 1979:99-146, 1982:75-90) as well as establishing similar systems in the smaller drainages (Creel and Adams 1986). In the higher elevations, dry farming was necessary, augmented with check dam systems and terraces (LeBlanc 1977:16-19; Sandor et al. 1986:166-180; Sandor and Gersper 1988:846-850). Such adaptations allowed the widespread use and occupation of highland and foothill locations.

MIMBRES VALLEY. By this time in the Mimbres Valley the transition from pitstructures to surface pueblos was complete, with some of the larger villages exceeding 100 rooms (Gilman 1980:236) and large communal structures appearing at the larger sites. Mimbres Black-on-White, Mimbres Polychrome and Mimbres Corrugated dominate the ceramic assemblage. Mimbres peoples concentrated in large pueblos along the main river channel as well as in smaller pueblos along the tributary streams. The appearance of the now famous "Classic Mimbres" bowls is the hallmark of this period.

The Mimbres phase ended quite abruptly in the Mimbres drainage about A.D. 1150, followed by a short occupational hiatus. This effectively ended the long continuum of Mogollon occupation in the region. What became of this Mimbreño culture is unknown, but the period following the nonoccupation is what LeBlanc (1980:271-316) terms the Black Mountain phase, a localized version of the larger Animas phase. Plain brownware and Playas Red pottery and sites that are typically small U-shaped single-storied pueblos of puddled adobe characterize the Black Mountain phase (LeBlanc 1980:282-283, Fitting et al. 1982:45). Black Mountain phase sites generally do not occur in the mountainous country of the region but, instead, primarily in the desert environs. LeBlanc (1980:284) interprets this phase as a reoccupation of the Mimbres River Valley by peoples of the newly emergent Casas Grandes cultural system of northern Chihuahua.

The last puebloan occupation of the Mimbres Valley is the Cliff phase which dates between A.D. 1375 and 1425. This phase assignment relates to the apparent fluid movement of Saladoans in and out of the valley without establishing a long-term occupation (Nelson and LeBlanc 1986:113). Not much is known of this phase except that population appears very low; they built multi-storied enclosed adobe pueblos of less than 100 rooms; used primarily plain and polished red slipped ceramics; and emphasized hunting and gathering subsistence over agriculture. By the end of this period, the Mimbres River Valley was completely abandoned.

CLIFF-GILA VALLEY. Just as in the Mimbres Valley, the period between A.D. 1000 and 1150 in the Cliff-Gila area also is termed the Mimbres phase. As mentioned above, this phase was preceded by the Mangus phase, a phase probably lasting as late as A.D. 1150, thus pushing the ending date for the Mimbres phase to ca. A.D. 1200 (Fitting et al. 1982:48-49). According to Fitting et al. (1982:47-49), the sites of this period may reflect an overlap between the Mangus and Mimbres phase peoples. Most of the Mangus phase sites also contain a Mimbres phase component. Few purely Mimbres phase sites occur in the Cliff-Gila region and those that do tend to occur in the Gila River Valley south of Cliff and not toward the upper reaches of the Gila River. Mimbres phase sites investigated in this region apparently show only a short time period of occupation.

The Animas phase follows the Mimbres phase in the Cliff-Gila region, described above as an occupation of the area by peoples from Casas Grandes. This phase was originally defined from work done at the Pendleton Ruin by Kidder, Cosgrove and Cosgrove (1949) as a test to determine if such sites were directly related to Casas Grandes. Work by subsequent archeologists (McCluney nd, 1962; Fitting 1973; Findlow and DeAtley 1976, 1978; Findlow 1979) indicate this phase relates to the Casas Grandes culture and that trade between the two areas, although fluctuating, was active. Trade with the Hohokam to the west and the Jornada Mogollon to the east took place as well. A suggested date range for this phase in the Cliff-Gila valley is from A.D. 1250-1300. As with Mimbres phase sites in the Cliff-Gila area, a similar pattern is true for Animas phase sites. In contrast to the Mimbres and Animas valleys, where Animas phase sites are high in density, such sites in the Gila Valley are quite sparse (Fitting et al. 1982:49) and Animas phase sites tend to occur south of the Cliff-Gila area in the southern deserts.

The Salado occupation follows the Animas phase in the Cliff-Gila region. Good dates for this occupation are unavailable, but most archeologists generally accept that it began about A.D. 1300 and continued until A.D. 1450 or perhaps later. Salado occupation in this subarea was more intensive than in the Mimbres Valley and consisted of "large multi-storied pueblos" (Fitting et al. 1982:50) surrounded by smaller farmsteads (Baker 1971). Not much is known about the Salado culture and it remains one of the more controversial topics in Southwest archeology. Archeologists do know that the Saladoan occupation of the Cliff-Gila area was high in density, expanded to some degree to the south of there, and also occupied the higher elevational environs of the Mogollon highlands that had been previously abandoned. Additionally, the Salado "represent a period of well-developed adaptation to intensive agriculture with well-developed regional interaction" (LeBlanc 1980:316).

A review of the general trends through the prehistoric periods of southwestern New Mexico and southeastern Arizona shows a general continuum of cultural progression from early hunting and gathering groups, an early introduction of agriculture and a full evolution toward agricultural based societies with concomitant changes toward sedentism and surface structure architecture. No firm evidence of Paleoindian occupation exists for the area. However, Archaic subsistence strategies of the early Cochise Culture apparently evolved out of the earlier Paleoindian pattern, but became more localized seasonal rounds of hunting and gathering. In the latter stages of the Cochise Culture, maize appears to have been introduced as a food supplement and the beginnings of agriculture in the Southwest occur during the last two millennium B.C. Pottery also was first introduced into the area during the later part of the San Pedro phase.

The Early Pithouse period follows naturally with a continuation of ceramics dominated by brownwares, with some red slipping. Housing tends toward small shallow oval pitstructues with ramp entryways, and site locations mostly occur on higher ridges and knolls, although many may eventually be found along the major drainages of the region. Changes distinguishing the Late Pithouse period are the trend toward larger more formalized pitstructures, larger sites located primarily along the first terrace of drainages, and a change to more slipped and/or decorated pottery, although the brownwares continue to dominate the ceramic assemblages.

The transition from the Late Pithouse into the Pueblo period is controversial. The general movement appears to be away from pitstructures and toward surface pueblos, with the pottery traditions becoming dominated by black-on-white decorated types. Subareas appear to have different characteristics occurring at different times or occurring in one area but not in others, and, in the later phases, populations abandon some areas, which become reoccupied only to be completely abandoned by the mid-to-late A.D. 1400s.

HISTORY OF THE UPPER GILA REGION

As true of the prehistoric periods, the historic period of the Mogollon Plateau is one of population dynamics, compressed into a 400-year period with perhaps more profound effects on both the physical environment and the resident human populations. Beginning with the gradual movement of Apachean groups into the area abandoned by protohistoric aboriginal peoples, continuing through the introduction of Europeans into the greater Southwest and the establishment of Mexico, and quickening with the pace of American westward movement, the area and the inhabitants were but a small part of the larger drama of major cultures encountering each other and changing forever what would have been the aboriginal sequence of human occupation in the region.

APACHE PERIOD (1600-1900)

Just when and from what direction the Apachean groups entered the Southwest is a matter of debate. Investigators argue two avenues of movement from the northern states: an intermontane route by way of Montana, Wyoming, Utah, Colorado and into New Mexico; and a corridor along the eastern slope of the Rocky Mountains and the western edge of the Great Plains. Scholars argue for each point of view (see Wilcox 1981:213-256) but the weight of evidence appears to favor the latter. The arrival date of these groups is open to speculation. Brugge, among others, subscribes to the intermontane route of arrival and feels that the Apache were entering the San Juan Basin by A.D. 1400 and may have replaced the recently departed Anasazi populations in that region as early as A.D. 1300 (Brugge 1984:172). Several researchers believe the Apacheans arrived on the plains of northeastern New Mexico by about 1525 with quick movement south and west during the next half century (Gunnerson 1956, 1974; Gunnerson and Gunnerson 1971; Schroeder 1974; Hester 1962:62; Dittert et al. 1961:247-248; Carlson 1965). Others, including Nowak and Jones (1985) and Winter (1986, 1988), believe Apachean occupation occurred in the same area as early as A.D. 1000.

Whichever is true, certainly the Apachean groups were residing within the general Rio Grande vicinity by the mid-to-late 1500s, and newly arrived Spanish explorers made distinctions between certain groups of these Athapaskan speakers. In 1583, Antonio de Espejo and Diego Perez de Luxán cited the occupation of Querecho Indians near the Pueblo of Acoma (Hammond and Rey 1966:182, 224-225). The Querecho Indians variously have been identified as Apaches (Schroeder 1963:6), Navajo Apaches (Bandelier 1892:294; Forbes 1960:57), and Navajo Apaches from which the Gila Apache split (Brugge 1984:171). In 1620, Fray Alonso Benavides mentioned the Apache de Xila (Gila) in the vicinity of Senecú (present-day Socorro) on the Rio Grande and indicated they lived 14 leagues (36 mi) west of the river. Other Apaches (Navajo) lived north of them as well as to the east (Apaches de Perrillo and Vaquero) of the Rio Grande (Hodge, Hammond and Rey 1945:82,84-85, 164; Schroeder 1962:3).

The names used for various bands of Apache in the region through time is confusing and contradictory in the literature. Add to this that some contemporary groups prefer not to be identified as descendants of groups appearing in the literature, e.g., the Warm Springs Apache prefer not to be called Chiricahua (S. Lekson, personal communication). However, for this discussion, the terminology will follow that outlined by Opler (1937) and Goodwin (1969) and will include only those groups most pertinent to southwestern New Mexico. In this regard, those groups classified under the heading Chiricahua in Figure 10 are the most germane to this discussion, with some mention of the Western Apache and Mescalero as needed. The primary group in southwestern New Mexico was the Chiricahua Apache, composed of three subgroups: 1) the Central Chiricahua, inhabiting extreme southeastern Arizona but often crossing into New Mexico; 2) the Southern Chiricahua, who occupied the Sierra Madre region of northern Mexico; and 3) the Eastern Chiricahua, also referred to as the Gila Apache, who occupied the Mogollon Plateau and surrounding areas of southwestern New Mexico. The latter group is the most important to this discussion and was composed of two major bands, the Mogollon Apache and the Mimbres Apache. The Mimbres Apache included both the Coppermine and Warm Springs Apache within its structure. The various bands often were named for the core area that particular group claimed or, later, by their major leader or chief. That is, the Mogollon Apache were named for the Mogollon Mountains, which was their core area, the Mimbres Apache occupied the Mimbres Valley, the Coppermine Apache centered near the Santa Rita del Cobre mines east of Silver City, and the Warm Springs Apache occupied the Ojo Caliente area within Cañada Alamosa on the eastern slopes of the Black Range.

Schroeder (1963:6-7) states that by the 1600s the Apache and Navajo had become distinct groups and were separated by a strip of territory north of the Río San José in the Acoma-Laguna-Zuni area (Figure 11). They remained separated until the close of the 1600s when the Navajo began emerging from their "homeland", expanding and raiding south and east into the northern fringe of the Apache territory until 1713 when problems in the northern territory of the Navajo caused by a Ute-Comanche alliance halted their southern movement.

By 1750, the Ute-Comanche threat forced the Navajo to relocate southward toward Jemez, Acoma and Zuni. Two decades later the Navajo had stabilized their territory with Canyon Largo on the north (rather than in the center) and Laguna-Acoma on the south. This brought the Navajo in direct contact with the Gila Apache and, by 1772, a full scale alliance between the two groups was in effect. The combined raiding of the two groups resulted in heavy losses in life and property for the Spanish settlements of the region and, by 1774, the Spanish abandoned the Río Puerco (Schroeder 1963:10-11).

For the next ten years the Spanish attempted to break the alliance between the Navajo and Apache, finally succeeding in 1785. The Spanish designated the Río San José as the boundary between the two Athapaskan groups and eventually convinced the Navajo to war against the Apache to the south. This Navajo-Spanish alliance resulted in a period of animosity and confused relations between the two native groups. The Spanish used Navajos in expeditions against the Apache and, in 1788, did so in a punitive action against the Gila Apaches at the headwaters of the Gila River (Schroeder 1963:11; Feather 1959:285-304).

The Navajo-Spanish alliance ended by 1796 when Apache-Navajo relations improved enough for an Apache-Navajo alliance that lasted until 1807. Although small raids by the Gila Apaches occurred through the last decade of the eighteenth century and into the early part of the 1800s, and a few campaigns by the Spanish as well, apparently there was a relative period of peace between the two cultures. The situation led to a formal peace between the Gila Apache and Spanish, and the area between the Santa Rita del Cobre and the Black Range, including the Mogollon and Mimbres Mountains, was set aside by the Spanish for the Gila Apache, who were not to leave the designated

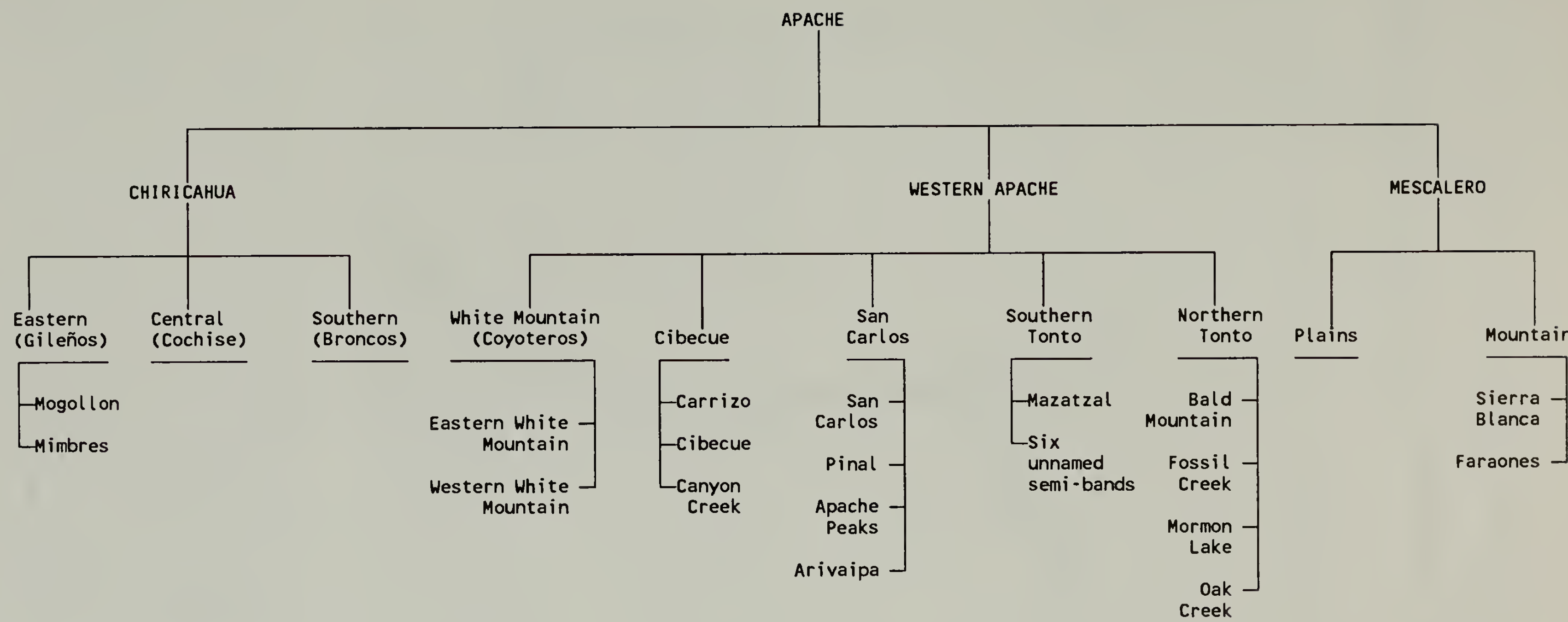


FIGURE 10: Chart of Apache Bands in Southwestern New Mexico, Southeastern Arizona and Northern Mexico (after Goodwin 1969).

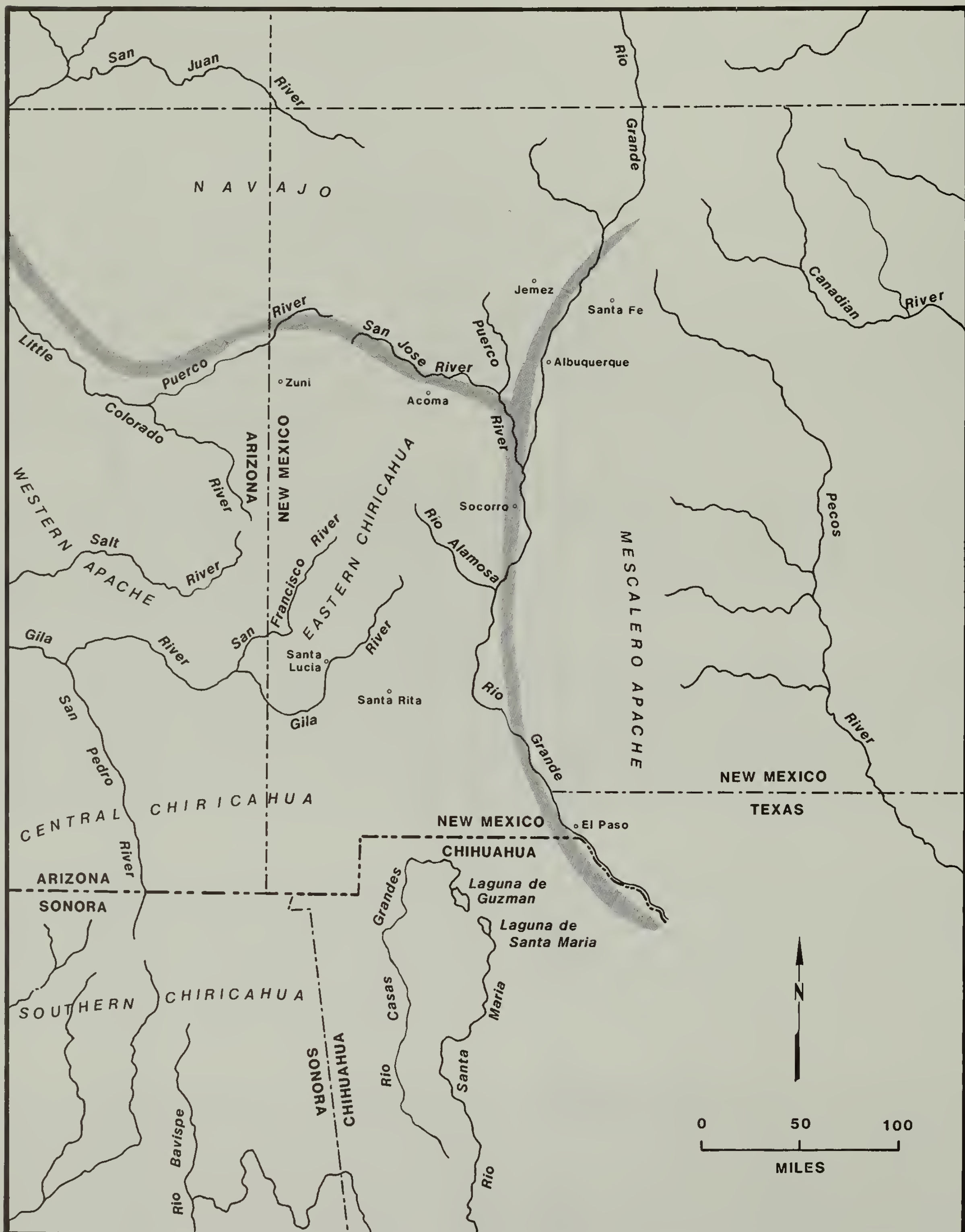


FIGURE 11: Map of Southwestern New Mexico Depicting the Location of the Major Apachean Groups.

area without Spanish permission. This formalized agreement failed, however, and by 1814 raiding increased, continuing through the following decade.

The mixed Apache-Navajo relations continued to the time of Mexican independence when yet another change took place, that of concerted military campaigns by the Mexican government against the Navajo. This resulted in fewer Navajo forays into Apache country to the south throughout the 1820s and 1830s and, eventually, yet another alliance between the two groups. This alliance undoubtedly encouraged the Mexican government to put a bounty on Apache scalps; a practice that continued throughout the Mexican period and greatly enhanced hostilities between the two cultures (see Smith 1962:20-42). In 1838, a Mexican campaign in northwestern New Mexico drove many Navajo out of the area and into Gila Apache country. The Gileños joined forces with the Navajo to fight off the pursuers, and a period of favorable Navajo-Apache relations followed (Schroeder 1963:11-12). Although several campaigns by the Mexicans took place, their situation worsened. When presidio garrisons were reduced, the Apaches quickly took advantage by increasing their raiding. Oddly enough, in spite of the increased raiding, Gila Apache chief Juan José Compa agreed to development of a mine in the vicinity of Santa Rita del Cobre. This led to a split among the Gila Apache in which the splinter group, headed by Cuchillo Negro, moved east of the Black Range to Warm Springs (Wellman 1947:248-249), forming the Warm Springs Apache.

Bancroft (1962:401) succinctly summarized the above period of history in the following passage:

> *The prosperity that began in 1790 may be regarded as having continued to about 1820, but as having disappeared entirely with the end of Spanish rule in 1822. During these three decades the Apaches were for the most part at peace under treaties which by gifts and rations it was made their interest to observe...Then during the last years of the war for* [Mexican] *independence...the Apaches resumed their depredations, the garrisons became demoralized, and all other establishments were practically abandoned. The causes of this radical change...were simply in the neglect of the presidios by the government...From 1811 money and food began to be inadequately and irregularly supplied...the Apaches, hostile as ever at heart, as soon as their rations ceased to be furnished liberally and regularly went on the warpath as the second best way of making a living...*

During the Mexican period, after obtaining a permit from the Mexican authorities, several parties of American trappers entered the Mogollon Plateau region, trapping for beaver on the Gila River and its tributaries. Apache relations with these trappers during this time were "extremely kind and friendly to the Americans [but, by 1837] there was a deadly hostility existing between...the Apaches and Mexicans" (Wilson 1934:77-78). This hostility resulted from a scalp hunting incident that closed the area to Mexican and American use. Several Coppermine Apaches, including chief Juan José Compa, were killed in a treacherous scheme by scalphunter James Johnson (Smith 1962:33-34). The survivors were quickly organized by Mangas Coloradas (Red Sleeves) and revenge was taken on both Mexican and American citizens. In no time, Mangas Coloradas "laid waste the whole of Northern Sonora and Chihuahua, and a large portion of Arizona" (Cremony 1868:201-202). The upper Gila River area, including the Santa Rita del Cobre mines, was completely abandoned by all Mexican and

American citizens. Only a few settlements along the Rio Grande and Tucson and Tubac in Arizona remained occupied. This continued until the war with Mexico in the mid-1840s when the various Apache groups tended to welcome the Americans as allies against a common enemy, the Mexicans.

When the Mexican-American War ended and the Americans replaced the Mexicans as adversaries, US military expeditions in the New Mexico-Arizona territory again affected Athapaskan relations. With limited US military presence during this decade, the Navajo began a migration to reclaim their homeland in northwestern New Mexico; a movement most likely encouraged by both the Mogollon and Western Apaches whose territories had been reduced by 15 or 20 years of Navajo occupation. The Apache, then, began a new era of raiding American settlements in Socorro and Valencia Counties (Schroeder 1962:12). The renewed raiding, and the killing of Navajo Indian Agent Henry Dodge by Mogollon and Western Apaches, resulted in a cavalry expedition by Colonel B. L. E. Bonneville into the upper Gila region. The more competent officers involved in the action considered the operation a farce, and the Apache of the region left the immediate area to raid the surrounding regions of southwestern New Mexico and northern Chihuahua. However, Navajo chief Sandoval, from the Mt. Taylor area, took the same opportunity to ride south with the cavalry, inflicting some measure of retaliation on the Apache by taking several women and children as prisoners. This was perhaps the only major encounter between Apaches and Navajos during the 1850s (Schroeder 1963:13).

The period from the late 1850s through the mid-1860s was again one of shifting territories for the Athapaskans of western New Mexico. The combination of US cavalry campaigns and/or Ute raiding in the Navajo territory resulted in constant movement for the Navajo, who eventually looked toward the south in the territory of the Mogollon and Western Apache for safety. Although most of the Navajo were interned at Fort Sumner during this period, several hundred escaped to the region between Flagstaff and Acoma. Although the initial contacts between the Western Apaches and Navajo were unfriendly, by 1864, the two groups often combined to raid white settlements (Schroeder 1963:13-14).

The double pressure of military campaigns and Navajo movement into the area south of Acoma caused the Mogollon Apache to abandon their homeland and move southeastward from the Mogollon Mountains to the Mimbres River and the Rio Palomas where they joined the Mimbres and Warm Springs Apache. This left the area south of Zuni-Acoma for the combined Navajo and Western Apache. This occupation continued until 1868 when the Navajo moved to their newly established reservation north of the Río San José (Schroeder 1963:15).

As early as 1855, the US military considered reservations for the various bands of Eastern and Western Apaches, when a treaty struck with the Mimbres Apache created a "reserve" for them that included the Santa Rita mines (Thrapp 1974:62). In 1859, Indian Agent Dr. Michael Steck stated that the Gila Apache "had selected, as a preferred site a reservation [including] bottomlands along the Santa Lucia [Mangas Creek]" (Thrapp 1974:63). And, again in 1860, Steck urged the authorities in Washington to create a reservation of some 24 km (15 mi) on a side located on the upper Gila River that would "include Santa Lucia Creek and springs" for settlement of the Mescalero, Mimbres, Mogollon and Chiricahua (Thrapp 1974:65-66). Neither of these reservations was officially dedicated and settlement by the various bands continued to concentrate in the Mimbres Valley, the area of Santa Lucia, and especially along the Cañada Alamosa in the Warm Springs area.

Not until 1870, with a push by Secretary of the New Mexico Territory William Arny, was serious action taken on a reservation for the Gila Apache. As a result, in 1871, the first formal reservation for the Eastern Apache was established, including a 1,554 sq km (600 sq mi) tract of land in the Tularosa Valley between present-day Aragon and Reserve (Thrapp 1974:130-131; Kayser 1973:16-23). The reservation was a failure; limited Apache occupation of the reserve lasted less than three years when they were returned to Ojo Caliente (Cañada Alamosa).

The 1870s proved to be a period of escalating problems between the American government and the groups comprising the Eastern Apache. In 1873, the Chiricahua Reservation was established in extreme southeastern Arizona between the Chiricahua and Dragoon Mountains. This action created two problems: 1) initially, all Eastern and Central Apaches were supposed to be settled on the Cañada Alamosa reserve, and the splitting out of the Chiricahua Apache resulted not only in separate reservations but separate control between the Departments of Arizona and New Mexico; and 2) it established a base and safe retreat for the Chiricahua and other Apaches who continued to raid into Sonora.

By 1876, the problems were acute enough that the Chiricahua Reservation was abandoned and the Apaches were moved north to the San Carlos Reservation along the Gila River where they were combined with the Western Apache. In 1877, pressure to also move the Mimbres Apache from Cañada Alamosa to San Carlos occurred and, by November of that year, the move was made. This was intolerable for the Mimbres Apache, as they were now concentrated on one reserve with bands of Western Apaches, many of whom the Mimbres considered enemies. Tensions, bad blood and purported killings occurred until late summer of that year when the Mimbres jumped the reservation and fled back to New Mexico where they eventually surrendered and were returned to Cañada Alamosa until the various government agencies could decide what to do with them. Late in 1878, after exploring several options, orders were given to return the Mimbres to San Carlos, the one place they absolutely refused to go. This decision was in the process of being reversed by the government after the Mimbres gave approval for formal settlement with the Mescaleros near Fort Stanton when word was received that civilian authorities were looking to arrest and try for murder Victorio, the head chief of the Mimbres Apache. This set into motion a series of events that led to the escape of numerous Mimbres Apache who spent the next few years depredating throughout southwestern New Mexico and northern Chihuahua (Thrapp 1974).

Although war between the military and various groups of Apaches that jumped the reservations continued, ending with the capture of Geronimo in Mexico in 1886, southwestern New Mexico experienced general peace and an influx of American settlers, miners, ranchers and others that would make up the next occupation phase of the region.

The days of Apache homelands in the Gila River/Mimbres Valley area were gone, as were such historical figures as Juan José, Mangas Coloradas, Mangus, Nana, Victorio, Cochise and others who had tried to keep the area for their people. Increasing pressure for mining and ranching, along with the government policy of combining various groups of Indians onto a few reservations, essentially ended Apache existence in the area. Why the Apache were difficult to manage and difficult to keep accurate records on, was because of their loose-knit social structure and because they were primarily a nonsedentary society. In short, the Eastern Apache "were composed of several groups whose territories adjoined one another within a geographic area, whose people intermarried, occasionally hunted and gathered together, and rallied to one another's aid in time of war. No political ties or central leadership existed except when efforts of two bands were combined, such as in warfare. However, the various groups of 'Gila Apaches' had not been forced together within a limited region" (Schroeder 1962:101) until they were finally subdued in the mid-1800s and relocated at Fort Sill, Oklahoma and on the Mescalero Reservation.

SPANISH PERIOD (1550-1821)

Due to distance of the northern frontier from the center of Spanish rule in Mexico City, the centuries of Spanish rule in the Southwest were at first tenuous, sometimes nonexistent, and always difficult. The people and supplies reaching the northern colonies quite often were threatened by natural disasters or marauding Indians. Geography, too, had a major influence on the patterns of Spanish settlement. The narrow corridor of the Río Grande, with its life-giving water and natural passage through the territory, served as the main artery for colonization and later expansion. Also, the smaller drainages of northern Sonora and southern Arizona (e.g., the Río Sonora, Río Yaqui, Río Bavispe) facilitated colonization of that region as far north as Tubac and Tucson. Due to its geography and Apache inhabitants, southwestern New Mexico served only as a crossroads between the major Spanish establishments; no attempt at settlement or development was made until late in the Spanish period.

The eighteenth century was a period of expansion by various Apachean bands that harassed Spanish activities between northern Sonora and Chihuahua to El Paso and up the Río Grande to Santa Fe. As a result, several military campaigns by the Spanish were directed at punishing and controlling the Gila Apache. Most were forays into areas south of Gila Cliff Dwellings (including the Mimbres and Animas valleys, and the Mimbres, Burro and Florida mountains), but Spanish military action did take place within the confines of the Gila River headwaters as early as 1747. Kessell (1971:133-160) provides a good account of this earliest known campaign into the heart of the Mogollon Plateau and also a very informative translation of the Jesuit priest Bartolome Sainz's description of the 1756 campaign through the same region. Kessell's work is the basis for the following discussion.

The earliest campaign was the first massive, coordinated effort aimed at punishing the Eastern or Gila Apache. Captain Alonso Victores Rubi de Celis and Franciscan friar Juan Miguel Menchero left El Paso in November 1747 for the Jornada del Muerto where they turned west and rode, with some 700 men, to the Río Mimbres, continuing west through what is now the Silver City area, until they reached and named the San Francisco River in eastern Arizona. It was on this trek that Bernardo Miera y Pacheco, charged with mapping the expedition route, may have made the first reference to the San Francisco River as a short passable route to Sonora. Following the course of this river north, they entered the heart of the Mogollon Mountains, eventually reaching the pueblos of Acoma and Zuni. Encountering bad weather, they then turned east, proceeding to Albuquerque and returning to El Paso. The expedition took three months, reduced the defenses of frontier Spanish settlements, and resulted in the taking of only a few prisoners. Although the expedition was deemed a failure, it provided the first European exploration of the Mogollon Plateau.

The campaign of 1756 covered much of the same territory as the earlier campaign but was more successful. The purpose of the second campaign was the same: invade the Gila Apache heartland to inflict casualties, take slaves, destroy property, and show the Gileños that the Spanish could, indeed, take the offensive in this continuing frontier war. Two columns of soldiers and auxiliary Indians would leave from separate presidios, track any Apaches encountered, and join forces at a predetermined place well within the Apache territory. In overall command from the presidio at Guajoquilla in southern Chihuahua was Captain Bartolome Antonio de Bustemante y Tagle, who was supposed to have participated in the 1747 campaign. Second in command was Captain Gabriel Antonio de Vildosola, from the presidio in Fronteras in northern Sonora, who would earn a reputation as an Indian fighter on the Spanish frontier and who may have brought with him on this expedition a young protégé by the name of Juan Bautista de Anza.

Some 23 years later, Governor Bautista de Anza would lead a column of soldiers and traders from Santa Fe toward Sonora with the intent of establishing the San Francisco River route as the primary connection between the two provinces. The route was too rugged for a road but, in an interesting side note, according to Feather (1959:287), Bautista de Anza found "sedentary Indians who cultivated maize in the vicinity of the present day towns of Alma and Pleasanton". After Bautista de Anza it would be almost another decade before the next recorded Spanish incursions into the rough country of the upper Gila River.

During the late summer of 1788 Bautista de Anza's successor as governor, Don Fernando de la Concha, led a party of several hundred soldiers and Indian auxiliaries on a expedition to seek out and engage as many bands of Gila Apache as possible (Feather 1959:285-304). From the pueblo of Acoma he headed south, crossing the Datil Mountains and the Plains of San Augustin. On September 10, he entered "a valley of considerable width in which was a river which...could well have been the San Francisco" (Feather 1959:295). The river, in fact, was the East Fork of the Gila in which de la Concha encountered his first Apache ranchería. He engaged the Indians, killing 18 and taking four prisoners. Continuing southwest he crossed several steep canyons and ridges eventually emerging from the Pinos Altos range near what would become the town of Pinos Altos. From here he turned east toward the Mimbres Valley, intersecting it "opposite the shoulder of the one called the Sierra del Cobre" (Feather 1959:296). This implies that the vicinity of Santa Rita already was known, and perhaps being mined a decade before its purported "discovery" c. 1804 (Feather 1959:296, footnote 3). Heading north along the eastern slopes of the Black Range, de la Concha crossed the heartland of the Warm Springs Apache, cut east to the Camino Real and returned to Santa Fe by early October.

About 1798, an Apache informed Colonel Manuel Carrasco of Chihuahua City about copper deposits in the area of the Mogollon Plateau. Realizing the value of the deposits, but unable to develop them himself because of other concerns, Carrasco interested local banker Don Francisco Manuel Elguea in the venture and eventually obtained mining rights along with the Santa Rita del Cobre Grant. This partnership continued until 1804, when Elguea bought out Carrasco and continued over the next several years to successfully mine the copper, which had a high value in Mexico during this period.

Although prosperous, the operation of the Santa Rita del Cobre mine was difficult, with Apache raids a constant threat and the transportation of the copper 2,092 km (1,300 mi) overland to Mexico City using frontier technology. A defensive structure was built to both protect and confine the slave labor imported to work the mines. Elguea died in 1809, and a series of events followed that lead to the decline of Spanish operation of the mine. The Mexican independence movement began in 1810, copper value fell, and Apache depredations increased. Sporadic attempts were made to work the mine throughout the remainder of the Spanish period, and during the subsequent Mexican period, but the glory days of copper mining in the area were gone, and not rekindled until after the 1880s, when new conditions allowed further exploitation of the region (Christiansen 1974:19-20).

Although there are many Spanish place names throughout this section of New Mexico, that is essentially all that remains of Spain's rule of this region. With their fight for independence won in 1821, the newly formed country of Mexico inherited the land and its people. The problems would be the same, but the money and people to do the job would be even more limited. Thus began the next period of history in southwestern New Mexico.

MEXICAN PERIOD (1821-1848)

During this 27 year period, the new government of Mexico had many concerns to deal with within the interior regions of the country. Therefore the northern frontiers were less of a priority for much of the time and thus often underfunded and understaffed, not providing adequate protection for Mexican citizens. This was quite true in southwestern New Mexico as the string of presidios were south of the area in what is now northern Mexico. Despite this situation, some activity did occur in southwestern New Mexico, again related both to mining and attempts to control the Apache.

The mining activities centered at the Santa Rita del Cobre mines which were still owned by the Elguea family who did not take a direct role but, instead, leased the mines to a series of people throughout the Mexican period. The operation was run by Juan Onis until 1825 when he leased the mine to Sylvester and James Pattie, Americans who spent two years working the mine. The Elguea family then leased the mine to a Frenchman from Chihuahua, Estevan Courcier, who made a successful venture out of the mine between 1828 and 1835, when he was forced to abandon it due to increased Apache hostilities. This was the period when the Gila Apache, in retaliation for the scalp hunter incident at the mines, ran all nonIndians out of the region. Before this, however, Courcier promoted a colony of one hundred families at the mine and supported a satellite colony 14 km (9 mi) east along the Mimbres River to provide corn and wheat to the mining community (Christiansen 1974:27).

After Courcier, the Elguea family leased the mine to Robert McKnight who apparently made of go of it until 1837. After this, the mine was leased by a series of people through the next decade and into the following American period until about 1860 when another boom occurred, following the entry of US troops into the area after the Civil War. During 1837, one other mining locale was established, Pinos Altos some 16 km (10 mi) northwest of Santa Rita. In this year, General Pedro Almendaris, commander of Santa Rita, discovered gold along "Santa Domingo" creek and built a small fort to house and protect the few miners working the deposits. The miners were, at some point, killed and the location of the mines forgotten until 1860, when rediscovered by three US troopers out of Tucson (Watson 1987:3-5). Other such mining locales may have been discovered and worked during this period but nothing is known of them. Undoubtedly, many men braved the Apache threat to prospect the mountains around Santa Rita in search of gold and other minerals, as were the trappers that entered the area. However, the uncertainties of Apache actions kept such incursions and any development to a minimum during this period.

AMERICAN PERIOD (1848-Present)

The first Americans known to enter the area of the Upper Gila River were the Patties, a father and son team who led a party of American trappers from Nebraska to San Diego in 1824-1826. In their first trip through southwestern New Mexico, they wound up leasing and working the copper mines at Santa Rita, but the primary purpose of the trip was trapping. In his sometimes questionable account of their adventures, the son, James Ohio Pattie, gives the first known account of an American in the Gila forks vicinity. In mid-December 1824, with a single friend, he camped at the confluence of what is now the East and West Forks. The following morning he and his friend separated in order to explore both branches for beaver. The separation lasted only a day when they reunited at Gila Hot Springs and continued up the West and Middle Forks for two days, returning to the hot springs via the East Fork (Pattie 1984:47-49), apparently not penetrating any further up the West Fork than the present-day visitor center.

Numerous other Americans were in the area during the 1820s and 1830s, mostly for trapping and, as mentioned above, some also were into prospecting for ore and Apache scalps. American involvement in the area after 1837 was limited, increasing only after US military victory in the War with Mexico and from pressure to provide protection to American immigrants during the California gold rush and to settlers in the westward movement. In southwestern New Mexico, during the pre-Civil War era, this primarily involved the establishment of a series of military forts to provide protection along the immigrant trail between Texas and California. This trail, after leaving El Paso, generally followed the Kearny and Cooke routes across the Mimbres Valley, through what is now Silver City, and on into Arizona territory.

In the Gila-Mimbres area, several military posts were established, the earliest being Cantonment Dawson at Santa Rita del Cobre in January of 1851 by John Bartlett during the boundary survey following the Treaty of Guadalupe Hidalgo (Thomlinson 1945:39). Due to Apache depredations on the military post at Dona Ana (along the Rio Grande) in 1850, recommendations were made to establish a fort further west to control the Coppermine Apache. Almost immediately after Bartlett left Santa Rita, Major Steen reoccupied the same fort, establishing Fort Webster at the mines. This fort was short-lived, however, and abandoned in September of the same year for a better more arable locale 14 km (9 mi) east along the Mimbres River. Two years later, in the spring of 1853, the military attempted to settle Apaches on farms near Fort Webster, but this failed due to lack of funding from Washington. By the end of this same year, Fort Webster was moved eastward again, near present-day Hatch and renamed Fort Thorn (Myers 1968:6-8).

In 1857, the government established a third military post in the region: Gila Depot, which was located on the east bank of the Gila River in the general vicinity of what is now the town of Gila. This small encampment also was short-lived, being established in May and abandoned by late summer of the same year. Other established camps in the area include: Burro Mountain Camp on the southeastern side of the Burro Mountains in 1859; and, in 1860, Fort McLane about 8 km (5 mi) south of Hurley. California Volunteers were stationed at an unofficial post at Pinos Altos from January to March of 1863 and, in the same year, a survey was made for a proper location of a military fort in the upper Gila River region. This resulted in the establishment of Fort West on the southern side of the Gila River about 1.6 km (1 mi) southwest of the town of Gila very near the location of the earlier Gila Depot. With the military presence established, settlers soon followed. However, Apache harassment of both the settlers and the military patrols caused the eventual abandonment of the post in January of 1864, with transfer of its personnel to Camp Mimbres (Myers 1968:8-25).

Camp Mimbres, established in August of 1863, apparently was located at Old Town on the eastern side of the Mimbres River, serving as a crossing on the immigrant trail. This camp, always a temporary establishment, was abandoned in September of 1864 and its property and personnel moved to Fort Cummings 30 km (19 mi) to the east. Fort Cummings, founded in the fall of 1863, also provided a patrol for the immigrant trail and was selected for a Mimbres Apache reservation in August of 1870, only to be abandoned as such in July of 1873 (Myers 1968:25-29).

The years following the Civil War were particularly busy in southwestern New Mexico. The Pinos Altos mines boomed and additional military presence was needed, including posts at Ojo San Vincente (later Silver City) and at Fort Bayard (established in August of 1866). The military established smaller camps around the area as needed, including outposts at Pinos Altos, north of Lake Roberts, on Sapillo Creek, and on North Star Road which ran north from the upper Mimbres Valley past Beaverhead, and at Cow Springs west of Camp Mimbres (Myers 1968:38-39). A similar camp was reported for Gila Hot Springs (Clark 1948:29) in the 1870s.

Besides the military history of the region during the 1860s and 1870s, the mining history of the area continued from the 1870s to at least the turn of the century. A gold strike occurred in 1859 at Pinos Altos when Forty-niners returning from California found gold at the old mine. For almost two years the boom continued with as many as 700 men working the area along Bear Creek. The boom ended in 1861 when Apaches attacked the mining camp in an effort by Cochise and Mangas Coloradas to rid the area once and for all of the white invaders. The Apaches experienced limited success in doing just that for the next five years, but the lure of gold was stronger than the threat of the Apaches and miners began to return to Pinos Altos in 1866 (Christiansen 1974:38). At Santa Rita, although never abandoned during the 1860s, only limited mining activity occurred due to the constant threat of Apache raids, lack of investment capital and reduced quality of copper ores. Additionally, the excitement of gold and silver strikes elsewhere took many miners away from the area in search of quicker fortunes (Christiansen 1974:35).

The 1870s and 1880s were a time of increased population movement into the New Mexico territory. People moved west after the Civil War, and New Mexico offered opportunities in both mining and ranching. With the population increase came a larger labor pool, more capital for investment, and a greater demand for federal protection of settlers from the Apache. During this time, settlement increased, mining exploration and ranching increased and the government established more military posts across the territory. Although the threat from Apaches in the 1870s in southwest New Mexico continued, mining exploration and development resulted in more inroads into the homeland of the Apache. Settlers established Georgetown and Silver City in the 1870s and the Cooney mine at Mogollon also was discovered; the beginning of one of the most famous mining camps in the territory, with a history of gold mining that would last until World War II. Other mining strikes in the general area included turquoise in the Burro Mountains, gold and silver at Lake Valley and Hillsboro, and, closer to the Gila forks, miners discovered the meerschaum deposits on Sapillo Creek in 1875, which continued, as many mines in the area would, through the 1890s. The silver boom would have the greatest effect on the region during this period with Silver City eventually replacing Santa Rita as the mining center of southwestern New Mexico (Christiansen 1974:48-56). But the drop in silver prices in 1893 would bring the boom times to an end with only a handful of miners continuing the trade in the area until the next big boom in the first half of the twentieth century.

During the 1880s, while the miners pushed further into the Mogollon Plateau and the military chased small bands of Apaches that had escaped the reservations, the beginnings of ranching in the region took place. By 1885, the Gila forks area was less a part of the Apache heartland and more a territory of the encroaching Americans. The area was undoubtedly explored by miners in earlier years and many of the soldiers and cowboys entering the area during the 1870s and 1880s kept a sharp eye out for not only the remnant Apache bands but also for valuable mineral deposits. Several encounters with Apaches by local cowboys or miners occurred in the Gila forks area. John Bullard, a highly respected businessman from Silver City, was killed during an attack upon an Apache camp on the West Fork of the Gila a few miles up from Gila Hot Springs (McKenna 1979:178). In a single raid by Geronimo in 1885, Thomas Prior and John Lilley were killed in Lilley's cabin on the West Fork, Ethel Harris was killed driving cattle from the West Fork to the Middle Fork, and Presley Popenoe was killed between the West and Middle Forks while returning from burying Prior and Lilley (Whitehill in McFarland 1974:22-23). Jason Baxter was killed near the McKenzie cabin at the confluence of White Creek and the West Fork during the same raid (McKenna 1979:64-69). In addition, the McKenzie brothers were killed at their cabin near the confluence of White Creek and the West Fork and William Benton was killed later at the same cabin (Woodrow in McFarland 1974:53).

During the decades before the turn of the century, people recorded several accounts of activities in the Gila Hot Springs vicinity. Aside from the brief mention of the hot springs in James

Pattie's account in the 1820s, these are the earliest known activities by Americans in the Gila forks locale, which begin with the hot springs.

Around 1883, James and Spencer Hill purchased a tract of land at Gila Hot Springs from John Perry on which they tilled 25 acres and grazed a small herd of cattle. They constructed a strong adobe house which they kept well stocked and, due to the popularity of the hot springs for treatment of numerous maladies of the miners, they also built small structures over some of the hot springs (McKenna 1979:13). Reports on the hot springs also are suggestive that the Apache used them for similar purposes. Colonel G.H. Sands reported in 1885 "a series of hot sulphur springs. Over some of these the decaying remains of 'wickey-ups' indicated that the Indians had used the vapor baths for healing purposes" (Sands 1957:342).

The Hill brothers' homestead at Gila Hot Springs became a central place in the Gila forks area through the 1880s and 1890s. Apache bands, loose from the confines of the San Carlos reservation, used the Mogollon Plateau as a retreat from the pursuing cavalry. Incidents of Apache/Anglo battles continued in the area until 1885. Forest Ranger Henry Woodrow reported the last remaining family of Apache at the headwaters of Mogollon Creek due west of Gila Cliff Dwellings as late as 1900 (McFarland 1974:56), apparently successfully avoiding detection in this rough country for at least 15 years.

However, with the removal of the Apache complete, and the impermanency of miners in the area, the last decade of the nineteenth century brought a new breed of person into the upper Gila region; people who homesteaded in the mountain valleys and began the smaller ranching enterprises. These were men who had fought adversity all their lives and who tended to settle matters quickly without benefit of the law. The Gila forks area was the scene of several instances of frontier justice during this period. Tom and Bill Grudging, suspected cattle rustlers, killed the son and hired hand of Tom Woods about a mile north of the Grudgings' cabin. Tom Wood, in turn, killed Bill Grudging downhill from the Grudging cabin and eventually followed Tom Grudging to Louisiana, killing him. James Huffman, a locally renowned bully who owned a small ranch near the mouth of the Middle Fork, was shot and killed by Jordan Rodgers and Buck Powell near the mouth of EE Canyon just upstream from the Grudging cabin (McFarland 1974:54-55). Both Bill Grudging and James Huffman are buried just a few feet outside the northern boundary of the national monument.

The changing times brought not only new people to the area but new problems for the landscape. Miners clearcut large tracts of land within the forests and ranching practices resulted in overgrazing of even more land. As a result, severe flooding of the Gila and its tributaries occurred as early as the 1890s. Additionally, the plentiful game for which the area was known waned, with greatly reduced numbers of bear, wolf, elk and bighorn sheep. The problem became serious enough that action was taken in 1899 when President McKinley signed into law the Gila River Forest Reserve as a protective measure. This withdrew several hundred thousand acres from settlement and development. A new era of history began on the Mogollon Plateau. The Apache threat was long gone and many of the local old west legends were gone or would pass away in the first few decades of the twentieth century: legends like Nat Straw, Ben Lilly, James McKenna, "Bear" Moore and Joe McKinney. Some of the mining centers still showed activity, particularly those that produced gold, zinc or lead, and some old timers still prospected the various claims looking for a resurgence of the glory years of the 1880s and 1890s. But with the new century the old west passed and a ranching economy emerged along with government management in the form of the United States Forest Service (USFS).

In 1903, the US Geological Survey conducted a scientific study of the Gila River Forest Reserve and recommended against further destruction caused by ranching activities. Damage from overgrazing was emphasized the following year when the worst floods on record took place along the Gila River. In 1907, the government placed the Gila River Forest Reserve under the administration of the newly created USFS and over the next several years USFS management and development took place (Murray 1988:44). The USFS created districts within the forest and hired a ranger. One of the first rangers of the area was Henry Woodrow, who hired on in 1909 and continued until his retirement in 1942. Despite local opposition to perceived government interference, Woodrow was, over the course of his career, able to fight fires, build trails, erect fire lookouts, survey various homestead claims on the Middle Fork, and oversee grazing activities on forest lands (Woodrow 1989:187-201).

In November of 1907, in partial response to widespread threats of destruction to prehistoric ruins in the Southwest, presidential proclamation established Gila Cliff Dwellings National Monument. Because the monument was within the 750,000 acres of forest reserve, administration of the monument fell to the USFS. USFS management continued until 1933 when the National Park Service (NPS) took over management responsibilities.

By the 1920s, overgrazing of forest lands was still a problem, existing practices needed changing. In an attempt for better control in the preservation of the forest lands, the Gila Forest was designated a Wilderness Area in 1924: the first such designation in the world. The following year extinction of the grizzly bear, gray wolf, bighorn sheep and Merriam's elk was officially recognized. Authorities introduced Northern elk species into the area in an attempt to offset some of this loss.

Continued, but limited progress marked the 1930s. The first year of this decade saw the arrival of Dawson "Doc" Campbell, a figure who would become intimately associated with the Gila Hot Springs/Gila Cliff Dwellings area. Although the transfer of management of the cliff dwellings took place in 1933, the monument was so remote and isolated that the NPS paid very little attention to it. Campbell took it upon himself to oversee the property and its ruins and acted as self-appointed guardian until 1942 when the NPS appointed him custodian of the monument at a whopping salary of one dollar a month. Doc served in this capacity until 1955 when he was hired as a seasonal ranger. This slightly higher employment status with the park service continued for eight seasons until Doc's retirement in January 1964. Perhaps in anticipation of Doc's retirement, the NPS hired James Sleznick as "Ranger in charge" in the spring of 1963. In February 1966, almost 60 years after the establishment of the monument, the NPS appointed Sleznick as the first superintendent.

The 1940s were quiet years in the Gila forks area, with the war on no developments or major events occurred in the area and the years following the war were nearly as quiet. In 1957, the boundaries of the Wilderness Area were revised to allow a corridor of access from Sapillo Creek, through Copperas Creek, up the Gila River to Gila Hot Springs, ending at Gila Cliff Dwellings. For the next ten years Doc Campbell and other citizens of the Silver City area pressured the NPS to upgrade the road. This action would encourage tourism in the area. Finally, between 1961 and 1967, the state paved the road from Sapillo Creek to Gila Cliff Dwellings.

In this same year the USFS determined that flooding in the Wilderness Area was getting worse, possibly due to the fire control practices and continued overgrazing. A major flood occurred within the upper Gila River area in 1984-1985, underscoring the problem. Damage was so extensive that it was declared a federal disaster area.

From the mid-1960s, the NPS took an active role in the management and interpretation of the monument. Federal funding provided a new visitor center and staff housing as well as other improvements. In 1975, due to its unique location/association with the USFS's Wilderness District Office, the NPS and USFS entered into a cooperative agreement for the USFS to administer the national monument with the NPS providing funding for preservation and interpretation of the ruins. This arrangement continues today. For a more detailed history of the monument, see the *Administrative History of Gila Cliff Dwellings National Monument* prepared by Peter Russell (1992).

ARCHEOLOGICAL HISTORY OF THE GILA FORKS REGION

As described in Chapter Three, a significant amount of archeology has been conducted in southwestern New Mexico over the past three-quarters of a century. The work accomplished has helped to organize the sequences of prehistory in the region; answered many questions as to who the people were, how they lived, and when they occupied the lands; and, typically, raised more questions than it has answered.

For the Gila forks region, however, archeological work has been much more limited than in surrounding areas such as the Mimbres River, Upper Gila River and San Francisco River drainages. In their report on the results of the Gila Cliff Dwellings excavations and artifact analyses, Anderson et al. (1986:21-35) provide a good description and interpretation of previous archeological work at Gila Cliff Dwellings and McFarland (1967:45-52) gives a listing and short description of the major work conducted in the Gila forks area up to 1966. Once the area became known, most of the visits to the prehistoric ruins in the Gila forks area were to the Gila Cliff Dwellings; themselves the most spectacular ruins, the largest cliff dwellings in the region, and the best for preservation and content. However, apparently there are some discrepancies in the early descriptions of the ruins concerning both the condition of the cliff dwellings and their physical appearance.

The following listing reviews, in brief form, the archeological history of the Gila forks region and incorporates nonarcheological information sources, as some of the early investigations were conducted before the establishment of professional archeology in the Southwest and such information can shed light on the condition and location of archeological sites in the region.

1877 Aside from a few trappers or mountain men who probably did not leave a record of their discoveries, cavalry soldiers of the US Army were among the first Americans to view and/or comment on the archeological sites of the Gila forks area. The earliest noted record mentioning prehistoric ruins in the immediate vicinity was by Henry Henshaw while accompanying the US Army geographical survey of the area in 1877. Henshaw apparently was unaware of the Gila Cliff Dwellings but did note a small cliff ruin (Three-Mile Ruin?) "perhaps eight miles" upstream from the mouth of Diamond Creek which is now known as the West Fork (Henshaw 1879:370-371).

1878 The first recorded visit to the Gila Cliff Dwellings was made by local mining entrepreneur Henry Ailman, accompanied by four other men looking to avoid jury duty. They left Georgetown on a "prospecting" trip and headed north toward the headwaters of the Gila River. Ailman gives a brief but accurate description of Gila Cliff Dwellings and states the only relics they could find were small corncobs, a good selection of which he took from the ruins. The following year another party from town made a second trip to the same ruins and took the mummified remains of an infant burial from one of the rooms. These remains were, according to Ailman, eventually sent to the Smithsonian Institution (Ailman 1983:57-58).

1884 Adolph Bandelier, one of the first anthropologists in the American Southwest, visited the Gila forks area during the first week of January 1884. In his trek from Sapillo Creek to Gila Hot Springs, Bandelier noted the natural features and archeology of the region. From the hot springs he journeyed upstream to Gila Cliff Dwellings, writing excellent descriptions of the immediate vicinity and of the large cliff dwellings (Bandelier 1892:359-362). Additionally, he investigated smaller open sites on several treeless terraces, noting "old pottery with some traces of foundation, but so disturbed that it was totally useless to attempt any measurement" (Lange and Riley 1970:194). Whether this disturbance was from natural causes or pothunting activities, Bandelier does not say. For the Gila Cliff Dwellings, he states the ruins have "A good deal of rubbish [but] very little pottery, visitors having picked it up. A great many [sandals] have been carried off, also stone axes" (Lange and Riley 1970:196). Another site of note visited by Bandelier was the large open site across the river from Jordan Rogers' ranch, now called TJ Ruin. Here, Bandelier's observations were so good that there is no doubt he was writing about TJ Ruin. He also visited two other sites in the immediate vicinity as well as sites just west of the Gila Hot Springs, and mentions (but did not see) a pictograph site in a side canyon near TJ Ruin (Lange and Riley 1970:198-199). As for much of the Southwest, Bandelier's work was the basis for later archeological investigations in the region. His eye for detail and comparisons on a regional scale are fundamental to archeology today and his notations on the condition of the Gila Cliff Dwellings in this early period are noteworthy.

Jason Baxter took James McKenna to the Gila Cliff Dwellings in the summer of this year. Baxter had been there before, as had the Hill brothers from Gila Hot Springs. McKenna (1979:47-50) noted the masonry walls and numerous axes with handles and "picked up turquoise beads of oblong shape [and] strung on animal sinews". He also took note of "many ollas made of red and gray clay, not found in this section [and] decorated with pictures of bear, elk, and deer" and "many pumpkin seeds and some corn on the cob [and] many pink beans and a few striped ones". Baxter and McKenna also found "a perfect mummy with cottonwood fiber woven around it" and under the floors, bones and skulls. McKenna's assessment of the ruin was that "many relics had been taken away even before Baxter and I went through...and little remained to carry off. The last time [he was there] the bats seemed to have staked their claims there".

1885 Lt. G. H. Sands accompanied a scouting and hunting party of soldiers from Fort Bayard into the Gila forks area and describes his discovery of the Gila Cliff Dwellings. He and another soldier turned up "pieces of pottery and a few arrow-heads" and found, in a store room, "a large quantity of maize cobs in a good state of preservation". The following morning, the other troopers returned to the cliff dwellings with Sands and "A few specimen pieces of pottery, arrow-heads, and the like, with one bowl in a perfect state of preservation, were gathered". Sands makes two observations of interest: 1) "Near the granary was a gloomy area, used as a shelter for domestic animals...an egress, used as a shelter for domestic sheep or goats"; and 2) "At a point forty feet below the crest, and about one hundred feet above the top of the cave, was another small house set like a nest in the face of the wall. This overlooked the opposite crest and must have been intended and used as a lookout station, the sentinels being lowered by rope-vines from the summit" (Sands 1957:340-346).

1888-1891 Professor Clement L. Webster conducted investigations in the general Mimbres area during this period and published a series of articles on his work (1891:768-770; 1893:435-438; 1912a:69-79; 1912b:101-115; 1913a:14-20; 1913b:43-48; 1914a:19-26; 1914b:44-46). During these investigations he discovered the mummified remains of a child in Gila Cliff Dwellings which he removed along with "Such a mass of evidence...in connection with the discovery of the mummy, as to leave no doubt as to the genuineness of this relic", including long human hair braids; corn cobs, husks and kernels; squash rinds, seeds and stems; gourds; sandals, wearing apparel, basket and other woven work; pottery; stone mills; weapons; and utensils (1893:438).

1900 Jack Stockbridge, a local prospector and cowhand, visited the cliff dwellings with Spencer Hill about this time and describes digging up two mummies and "quite a few relics of different kinds: a stone axe or two, a small olla, some arrowheads, and little eight-rowed blue and yellow Indian corn" that they took to the hot springs, later giving all materials to a man who professed to work for the Academy of Science in San Francisco. In contrast to McKenna's statement above regarding the condition of the ruins, Stockbridge stated that "Before Spence Hill and I was there three years ago, just a few soldiers and prospectors had been up there. It didn't look as if anything had been disturbed very much" (McFarland 1974:9).

1903 Jack Stockbridge again stopped at the cliff dwellings in this year while leading a detachment of cavalry from Fort Huachuca, whose purpose was to map areas of the Mogollon Mountains, back to Gila Hot Springs from the town of Mogollon. During this visit he took Lt. Stanley Koch up to the cliff dwellings so the young lieutenant could get a photograph of the ruins. At this time Stockbridge made a most interesting statement concerning what should be Lt. Sands lookout: "So we got on top of the ridge and then we saw the sun was shining directly in a hole across the canyon, on the right above the cliff dwellings--up about fifty or sixty feet and about a hundred feet below the top of the bluff. The hole was big around as a room--about eight or ten feet in diameter. Lieutenant Koch had a pair of high-powered glasses...and we looked in that hole and sized things up quite a bit. You could just see pretty near everything. You could even see an old gun a-standing next to the wall towards the opening. It looked like one of those flintlock guns...and it looked as though a bunch of packsaddles and equipment and one thing or another had been piled back in the cave a little ways. About ten or fifteen feet from the mouth of the hole you could see where there had been a trail come off from it, but next to it the bluff had broken off and there were big rocks lying below in the canyon. Even if you had ropes and come down to it from the top of the bluff, you'd be swinging way out in space because of the way the overhang juts out. So that was the first time they ever knew there's anything up in that hole--you couldn't hardly see the hole from the bottom of the canyon. Boy, was that something to look right in with the sun shining in like that!" (McFarland 1974:10). Don Morris rappelled into this cave in 1968 during his survey work and reported nothing was found in the cave (D. Morris, personal communication).

1907 Walter Hough, of the United States National Museum, published his report on prehistoric sites of the upper Salt and Gila rivers (Hough 1907). Hough concentrated primarily on the Arizona portion of his study area (along the Gila River in Graham County, the Blue River and Fort Apache region), with the New Mexico portion mainly in the Reserve area along the upper reaches of the San Francisco River. In the immediate vicinity of the Gila forks, he mentions only three sites: 1) Gila Cliff Dwellings, which he did not visit personally but reproduced from Bandelier's earlier comments; 2) a cliff house and cave located on Diamond river, which Hough described in almost the exact words of Henry Henshaw (Hough 1907:30), suggesting he did not visit that ruin either but simply used Henshaw's description as he did Bandelier's; and 3) a single sentence on cliff dwellings located "on the headwaters of the Gila river, near Hot springs" (Hough 1907:32). In this same year the government created Gila Cliff Dwellings National Monument.

1912 In this year, Hough, while working at the National Museum in Washington D.C., catalogued and described an infant mummy reportedly donated to the museum by the acting Gila National Forest supervisor A.J. Connell. This specimen, apparently taken from Gila Cliff Dwellings, was of a child only a few months old at death, wrapped in the skin of a wildcat and buried in the debris of the cave (see McFarland 1967:46).

1927 Editha L. Watson conducted a reconnaissance of over one hundred sites in the Silver City/Pinos Altos/Cliff/Gila Cliff Dwellings area in an attempt to better define the Mimbres culture area (Watson 1927:174-234). She provides brief descriptions of 30 ruins along all three forks of the Gila River, including Gila Cliff Dwellings and TJ Ruin (Watson 1927:188-220; 1929:299-306).

1928 Between the years 1926 and 1930, C.B. Cosgrove conducted fieldwork in southwestern New Mexico that included work in the upper Gila area in 1928 and 1929 (Cosgrove 1947). This work represents the most thorough reconnaissance conducted in the upper Gila region to this time. As reported, Cosgrove covered the area from Cliff, New Mexico, through the Sapillo Creek area, and into the headwaters of the Gila forks. Cosgrove recorded seventeen cave sites and cliff ruins between Mogollon Creek, Sycamore Canyon and Sapillo Creek; three were in the immediate vicinity of Gila Hot Springs, eleven along the Middle Fork of the Gila River and seven more along the West Fork. The focus of this work was to acquire information on the perishable materials of prehistoric cultures found only in cave deposits. In addition, the study was to determine any connections between the Basketmaker culture of the Four Corners area and the Basketmakers of west Texas/southern New Mexico. A statement of note from Cosgrove is that the 89 caves containing prehistoric deposits "in every instance" were previously disturbed (Cosgrove 1947:3). In fact, the work was done in part from the fear that looting would soon destroy all such deposits, rendering them useless for future studies.

1935 Assistant Engineer G.H. Gordon made a trip to Gila Cliff Dwellings in March 1935, the purpose was to acquire specific information on the ruins and make recommendations for protection of the dwellings. Gordon made a sketch map and profile of the cliff dwellings (used repeatedly by later archeologists) and noted specific information about the architecture within the caves. He states that all "seven caves contained dwellings, but...only four of them have the remains of buildings [still] in them" (Gordon 1935:1-2). He also noted that, while there was some evidence of digging within the ruin in the past, total looting was not apparent. He does mention within a month of his visit "the site has been visited by five amateur diggers from a nearby CCC camp" and that three years previous a party had done "more or less digging [and] pushed over a wall" (Gordon 1935:2). Gordon goes on to make several recommendations regarding the monument, including better access to the monument from Sapillo Creek, mapping of the cliff dwellings and a plan for their stabilization, fencing of the mouth of Cliff Dweller Canyon to control access, a topographic survey of the monument, and appointment of a custodian to oversee the protection of the monument (Gordon 1935:2-3).

1937 Charles Gould, then NPS Regional Geologist, was part of a team studying the feasibility of making the Gila Primitive Area into a National Park (Thompson et al. 1937). As a part of the report on this study, Gould compiled a separate report on the geological setting of the Gila Cliff Dwellings and gave specific measurements for each of the six caves. He also included general comments on the ruins of Gila Cliff Dwellings (Gould 1937).

Erik Reed also was a team member of the above group and provided an overview of the history and prehistory of the area as known at the time (see Thompson et al. 1937).

1938 Frank C. Hibben conducted an investigation of dry caves in the "Middle Gila region of New Mexico" during this time and implied that additional work was to proceed the following field season (Hibben 1938:36-38). In a brief article, he describes a cache of broken bows and compound arrows accidentally found in a small cave "just to the south of the Gila Cliff Dwellings National Monument". All 94 bow specimens were intentionally broken when placed in the cave with subsequent breakage caused by bears. Hibben also found large sherds on the surface of the cave floor that may date the materials to the Classic Mimbres (Hibben 1938:38).

1942 Charlie Steen conducted the first stabilization of Gila Cliff Dwellings at this time. During a five-day period in July of this year, he and one helper did minor stabilization of the ruins in caves 2 and 3, made a tape and compass map of the ruins within caves 2 through 5, removed all modern trash from the ruins, and did minor trail work below the caves. In addition, Steen dug test trenches in two rooms within or adjacent to Cave 3 to provide some information on the archeology of the cliff dwellings for then custodian Dawson Campbell (Steen 1942a). Steen's map depicted what he called Group 2 and included all rooms within caves 3 through 5. His room numbering does not coincide with that used today but are reconciled by Anderson et al. (1986:25). In an interesting note on the cliff dwellings, Steen states "The entire ruin has been churned by pothunters. I do not believe that a single room exists in the cliff dwelling in which there is undisturbed fill" (Steen 1942a:2). At this time, Steen also provided an overview of the regional archeology based on work conducted in the area since Reed's overview a dozen years earlier (Steen 1942b).

c. 1948 Edward Danson, during his extensive areal survey of west central New Mexico and east-central Arizona, makes note of a small six-room pueblo with an associated kiva overlooking the East Fork tributary of Diamond Creek. Danson (1957:27) assigned a Pueblo II date to the site, describing the ceramics as "primarily brown, both plain and corrugated, and the painted ware resembled that of the Tularosa River country rather than that of the Mimbres".

c. 1955 Custodian Dawson Campbell conducted his own survey of the immediate Gila forks area and produced a map and notes on those archeological sites (Campbell nd). Subsequent park service experts used this information to justify expansion of the monument boundaries, a local movement culminating in 1962 with the addition of the detached TJ Unit to the monument.

1955 Archeologist Roland Richert performed additional stabilization at the cliff dwellings during July and August of this year. The repair was to correct structural weaknesses caused by both natural deterioration and vandalism within the main units of the ruins. He also did some trail repair and built a stile stepway between caves 3 and 4 (Richert 1956). Undoubtedly influenced by Doc Campbell, Richert spent his free time conducting a reconnaissance of the West Fork area, "within a mile or two of the Monument" (Richert 1955a:1). Richert took sherd collections from the surface of eight sites, including Gila Cliff Dwellings, TJ Ruin and LA10049. He made what may be the first reference to TJ Ruin as possibly having been two stories high and to the importance of finding Apache sherds on sites in this area. He sent his collection of ceramics to Dr. Emil Haury of the Arizona State Museum for identification (see Richert 1955b).

Archeologist Gordon Vivian, while on vacation with his family, spent five days in August at the Gila Hot Springs. While there, he inspected Richert's stabilization work and looked at several sites outside the monument with Doc Campbell. He mentions the concern of Doc and other locals about the possibility of the NPS dropping Gila Cliff Dwellings from the park system. Vivian took another surface sherd collection from TJ Ruin and recommended that the NPS not abandon the area without first doing "a thorough study of its potentialities" (Vivian 1955).

Dale S. King, park service naturalist, visited the area in September to obtain enough information about the area to make recommendations on expanding the existing monument and/or establishing an even larger Gila Wilderness National Park. In the company of Doc

Campbell, King traveled 18 km (11 miles) of the West Fork looking at it from a naturalist's viewpoint, looked at most of the archeological sites previously visited by Richert and Vivian, took surface artifact collections, and met with several people in the Silver City area concerning the matter of enlarging the park. King was quite impressed with the area after this visit and strongly recommended expansion of the unit (King 1955).

1956 As a result of increasing pressure from local people and the result of previous trips by Vivian and his staff, Gordon Vivian visited the monument in April, along with NPS managers and Regional Archeologist Charlie Steen, to determine if additional sites in the immediate vicinity should be added to the monument. Together they visited Gila Cliff Dwellings, TJ Ruin, LA10060, LA10045 and other sites in the area. Vivian made further recommendations about the need to study the area and consider expansion of the monument. He also made some very insightful comments on the archeology of the area (Vivian 1956).

1958 In the summer of this year a group of amateur archeologists excavated 10 rooms of a Classic Mimbres site about 8 km (5 miles) up Diamond Creek from its confluence with the East Fork (Cress nd).

1962 James Sciscenti of the Museum of New Mexico surveyed the proposed right-of-way for improvement of State Route 15, recording six sites between Gila Hot Springs and the Heart Bar Ranch (Honea 1963:1).

1963 Kenneth Honea and Jack Smith, also of the Museum of New Mexico, conducted excavations at a lithic scatter recorded by Sciscenti northwest of Doc Campbell's store. The site, based on recovered projectile points, dates to the San Pedro Stage of the Cochise Culture (Honea 1963:29-32).

Doc Campbell conducted limited stabilization of loose rock near Room 31 in Gila Cliff Dwellings, including digging a short trench for a footing (Campbell 1963).

Gordon Vivian, assisted by Dee Dodgen, conducted the most extensive professional excavation within Gila Cliff Dwellings. They excavated 33 rooms within caves 2 through 5 and sampled Cave 6 (Vivian 1963a and 1963b; Vivian and Dodgen nd), but the unfortunate death of Vivian precluded the analysis and report preparation by those conducting the fieldwork. Anderson et al. (1986), who eventually reported the findings, did a commendable job considering the loss of provenience information during the intervening years. At this point, considering the long history of vandalism within Gila Cliff Dwellings and the extensive removal of fill during these excavations, many felt that very little, if any, deposits remained within the cliff dwellings.

1966 Laurens Hammack directed highway salvage operations in the Gila Hot Springs/Gila Cliff Dwellings area. Hammack (1966) provides a brief description of the three sites excavated and offers some preliminary conclusions for each. The largest site, Diablo Village, consists of a Georgetown phase component of 10 pitstructures and associated extramural pits and surface architecture related to a later Mimbres phase occupation, i.e., two masonry surface rooms and a square kiva dating to c. A.D. 1050-1100. The second site consists of a late Mangus phase component with a small roomblock of six rooms in two contiguous rows. The third site is the remains of an adobe house and associated features probably dating to the latter half of the nineteenth or early twentieth century. A small cemetery outside the excavation area gives this site the name Graveyard Point Ruin (Hammack 1966).

As part of the above highway salvage project, Ronald Ice excavated West Fork Ruin at the mouth of Adobe Canyon nearer the Gila Cliff Dwellings (Ice 1968). This site, which Dr. Harry Schafer of Texas A&M is currently analyzing, consists of a complex stratified site containing pithouse architecture of the Three Circle phase (A.D. 900-1000) and both pithouse and surface pueblo structures of the Mangus phase (A.D. 1000-1100). In addition, excavations exposed remains of a historic occupation on the site. This later homestead probably was the first headquarters for TJ Ranch, which was later relocated downstream to the Heart-Bar Ranch complex.

1967 Don Morris conducted a stabilization inspection of the Gila Cliff Dwellings. His recommendations were combined with Richert's below.

Roland Richert conducted another stabilization inspection of the Gila Cliff Dwellings in November of this year and combined his and Morris' earlier observations into a small report for the Chief of the Southwest Archeological Center (Richert 1967). Richert included a number of annotated photographs as a guide for the proposed stabilization work.

1968 Don Morris performed stabilization work in rooms 36 through 39 and excavated Cave 1 at Gila Cliff Dwellings. He also constructed the return trail from the cliff dwellings around the north side of ridge to the river (Morris 1968a:1-3), and conducted an intensive reconnaissance of the area around the main unit of the monument and the visitor center near TJ Ruin. In all, he added 98 previously unrecorded sites to the local inventory, bringing the total for the area, at that time, to 106 archeological sites (Morris 1968b; 1986:14).

1970 Ronald and Pam Everhart, staff personnel from the visitor center, excavated an adult burial just upstream from Cave 1, discovered and reported by a visitor to Gila Cliff Dwellings. No artifacts were associated with the burial (Everhart and Everhart 1970).

George Chambers conducted limited ruins stabilization within Gila Cliff Dwellings, in the area of rooms 25 and 27 (see Nordby 1979:4).

The USFS recorded a series of four sites along the East Fork at the base of North Mesa. Three sites are prehistoric with pithouse remains and one small masonry pueblo, while the fourth site consists of cabin remains and a cemetery dating to the late nineteenth or early twentieth century (MNM 1991).

1974 Gila National Forest Archeologist Joseph Janes conducted excavations at the Lagoon Site (Janes and Reeves 1974).

Joe Janes tested an extensive artifact scatter above TJ Ruin before construction of the heliport (Janes and Smith 1975).

1975 Crew members from Eastern New Mexico University, under the direction of James M. Warnica, conducted two field seasons of work at 16 sites in the upper reaches of the East Fork of the Gila River between Diamond Creek and the DD Ranch. The purpose was to recover, through surface collection and test trenches, a sample of Mimbres pottery to compare with suspected Mimbres sherds found along the east slope of the Guadalupe Mountains near Carlsbad. Warnica (1975) briefly reported the preliminary results of the fieldwork, but the final results of the study apparently are unreported.

Beginning in the early 1980s, and continuing through that decade, interest in the Gila forks region increased considerably, measured by the number of visits to the area by cultural resource professionals. The activity included a series of small surveys by the USFS or by members of the WS Ranch Archeological Project under a special use permit with the USFS. These surveys covered small acreages and were executed ahead of proposed construction projects (e.g., forest trails and telephone line installation). Also during this time, NPS personnel made a number of stabilization inspections at Gila Cliff Dwellings as well as other sites in the area of concern to the USFS.

1979 In July, Larry Nordby and James Bradford visited the monument with a two-fold purpose. First, a stabilization inspection at Gila Cliff Dwellings and, at the request of the USFS, to the pictograph panel, Scorpion Corral and LA10039, all along the interpreted "Trail to the Past". In addition, Nordby and Bradford conducted a stabilization inspection at Three-mile Ruin, a small cliff dwelling about 5 km (3 mi) upstream from Cliff Dweller Canyon (Nordby 1979). Second, Bradford collected information for revision of the monument Resource Management Plan.

1981 Joe Janes conducted a survey of two acres at LA10006 for construction of an explosives magazine. However, Janes misplotted the survey by about 1,200 feet to the north-northwest (Janes 1981).

1983 Michael Mallouf (1983a) surveyed a short section of land for installation of an overhead telephone line between State Route 15 and the old Military Road just northeast of Copperas Peak. Mallouf recorded one lithic scatter and two isolated artifacts.

Mallouf (1983b) conducted another survey along State Route 15 from the visitor contact station at Gila Cliff Dwellings to the Catron/Grant county line, a distance of about 8 km (5 mi) totalling 20 acres. Mallouf recorded four archeological sites in the vicinity of Hammack's Diablo Village, including two small pueblos (one with historic graves), and two lithic scatters, one with a possible pitstructure.

Stephen Adams (NPS) conducted a stabilization inspection of Gila Cliff Dwellings and the small cliff dwelling on the "Trail to the Past" in August of this year. He made several observations on how to better protect the two ruins (Adams 1983).

1984 Again for telephone cable work, Mallouf (1984a) surveyed along Forest Road 528 for a distance of about 3 km (2 miles) up the East Fork canyon. He located five archeological sites within this area: three artifact scatters; one small pueblo; and one rockshelter with an enclosing masonry wall.

Continuing from near the county line where he ended in 1983, Mallouf (1984b) surveyed a 3 km (2 mile) length of State Route 15 down to the East Fork confluence. He recorded two small lithic scatters along the road right-of-way.

1985 Nordby returned to Gila Cliff Dwellings in March of this year to conduct a stabilization inspection. The focus was primarily aimed at a problem of rock deterioration underlying Cave 2 and assessing visitor impact to the cliff dwellings. Nordby made specific recommendations to alleviate these problems (Nordby 1985).

Mallouf (1985) surveyed a half mile transect for an overhead telephone line from just south of Gila Hot Springs on the West Fork eastward to the XSX Ranch on the East Fork. He found one previously recorded site and one unrecorded site; the newly found site is another prehistoric lithic scatter with possible cobble wall alignments near its southern boundary. Mallouf also recorded three isolated artifacts.

The USFS surveyed 5 acres (including the 2 acres surveyed by Janes in 1981) at LA10006 for construction of an air quality monitoring station (Scoggins 1985).

The USFS performed a clearance survey along the return interpretive trail at Gila Cliff Dwellings for proposed trail rehabilitation actions (Bornong 1985). Clearance was recommended.

The USFS conducted a survey as a result of proposed rip-rapping of the highway bridge near the visitor center (Newton 1985). Newton recorded two small sites: the one just north of the bridge is a small artifact scatter with two areas of possible cobble wall alignments; and the other, a previously recorded site about 2 km (1.3 mile) southeast of the bridge near Hammack's Diablo Village, near the source area for the rip-rap material.

The USFS surveyed, for purposes of trail rehabilitation, approximately 43 km (27 mi) of backcountry trail (totaling 216 acres of surface area) from Gila Cliff Dwellings up the West Fork, over Turkey Feather Pass to Iron Creek (Stieger 1985a). They recorded no cultural resources within the proposed trail areas.

The USFS conducted similar trail survey up the Middle Fork from north of the visitor's center to the mouth of Iron Creek, a distance of about 56 km (35 miles), with a total surface area of about 278 acres (Stieger 1985b:2). Nine archeological sites were recorded, including a pictograph site, two pithouse sites, a small pueblo site, a rockshelter, an artifact scatter with a historic component and three historic sites.

As a result of previous concerns about bedrock deterioration in Cave 2 at Gila Cliff Dwellings, the NPS contracted with geologist Bruce Wachter to conduct a rock deterioration/hazard study at Gila Cliff Dwellings. He made several recommendations about geological concerns in the visited caves (Wachter 1985).

1986 Nightengale (1986a) performed a clearance survey before improvements at the Forks Campground (East and West forks confluence) and an associated borrow area in nearby SA Canyon in February of this year. Nightengale encountered no cultural resources.

Nightengale (1986b) conducted an archeological survey of a portion of the Gila River Trail from near the Forks Campground, downriver 51 km (32 miles) to the confluence of the Gila River and Turkey Creek; and a two-mile segment along the Sapillo Creek Trail between State Route 15 and the Sapillo Creek/Gila River confluence. Along the first trail, Nightengale recorded twelve archeological sites and four isolated artifacts. The record includes five pueblo sites, four pithouse sites, two lithic scatters and one historic site. The Sapillo Creek segment included one historic feature (wall) and two isolated artifacts.

Gila Cliff Dwellings National Monument was nominated to the National Register of Historic Places. Traylor (1986) completed a nomination form in April of this year, accepted by the Keeper of the National Register in 1988.

James Bradford and Peter McKenna spent a week in July making a plane table and alidade map of TJ Ruin, the first map ever of this important site. While there, McKenna conducted an in-field surface artifact analysis to gain additional site information (Bradford 1986; McKenna and Bradford 1989).

Based on Wachter's report, and those by Adams and Nordby, John Morgart of the NPS inspected the Gila Cliff Dwellings caves in October to address specific recommendations for protection from visitors. His conclusions included a strong recommendation to fund stabilization action and erect barriers to prevent visitors from entering certain areas of the ruins, both for visitor safety and protection of the fragile ruins (Morgart 1986). Secondarily, Morgart visited the Grudging cabin with USFS personnel to inspect and document the structure for conservation needs.

1987 With funding provided, Morgart returned to the monument to conduct the recommended stabilization work at Gila Cliff Dwellings. Besides a variety of minor stabilization actions, the work focused on loose rock dangers within the interpreted areas of the cliff dwellings and erecting rail barriers to prevent visitor entrance into certain parts of the ruins (Morgart 1987a, 1987b).

At the request of USFS staff, Regional Archeologist Ronald Ice and ruins conservation expert Jim Trott traveled to the monument to discuss cultural resource management issues and to inspect five sites of particular concern to the staff, including two sites outside the monument boundaries. Visited sites within the monument included Gila Cliff Dwellings, LA10058 and TJ Ruin (Ice 1987).

1988 USFS personnel conducted an archeological clearance survey for construction of a rappelling tower on the southwest edge of site LA4902 near the visitor center (Kramer 1988).

In August, USFS personnel conducted a survey of an unspecified number of acres abutting the north side of the detached TJ Unit. They recorded several sites (Robert Shiowitz, personal communication).

James Bradford and crew conducted the first phase of the resurvey of Gila Cliff Dwellings National Monument during the month of September (Bradford 1988).

1989 Bradford completed the fieldwork for this project in the early spring of this year (Bradford 1989a).

Bradford assisted USFS personnel in conducting an archeological survey of the USFS Administrative Area surrounding the Gila visitor center (Bradford 1989b). Bradford revisited several archeological sites and updated site information on them. A report on the results of that survey is forthcoming from the USFS (Shiowitz, personal communication).

1991 John Morgart, of the NPS, again conducted ruins conservation work during May of this year. In a cooperative agreement with the USFS, Morgart and his crew worked on a small cliff dwelling (LA10033) on the "Trail to the Past" interpretive trail behind Scorpion Campground just downstream from Cliff Dweller Canyon. Here, the crew repaired damaged wall tops and abutments on the north wall and the interior partition wall as well as replaced a lintel above the structure doorway. Drainage into the rockshelter was altered somewhat to redirect water flow outside the upstream end of the shelter (John T. Morgart, personal communication).

Also during May, Bradford returned to the monument to assess damage to archeological sites within the monument as a result of the forest fire that started at the mouth of EE Canyon and spread downstream into the northwestern corner of the main monument unit, completely destroying the last remains of the Grudging cabin. Within the monument, the fire burned four archeological sites and firefighting resulted in direct damage to four sites: affecting seven sites in all (Bradford 1991).

As becomes apparent in the above review, the type and level of investigations of archeological remains in the Gila forks region ranged from the slightly curious, to generalized regional reconnaissances, to intensive investigations of particular sites or acres. The history of investigations in the region is divisible into four periods of roughly thirty years each, summarized as follows:

1877-1905. This was the time of initial discovery and description of the archeological resources of the area. The eight investigations listed during this time fall into a) three investigations resulting from military action (cavalry patrols and geographical survey), b) three from private parties (prospecting and ranching activities), and c) two from anthropological inquiry (large area reconnaissances). Information gathered by the first two sources (soldiers and private citizens) varied in thoroughness and accuracy because the descriptions were incidental to the primary purpose of the groups, the results being more a reflection on the particular interest of the individual rather than the quality of the information. With the latter group, the level of investigation falls within the period when southwestern archeology as a science was in its early years and developing the basis on which the discipline was built. As a result, the nature of the investigations was geared toward the basics of establishing the cultural identity of the prehistoric peoples, their relationship to prehistoric cultures elsewhere in the Southwest, and any possible relationship to surviving Indian cultures. Collection of artifactual materials for both private and public collections also was a priority at this time.

1906-1934. The early years of the twentieth century heralded an era of lessened military presence in the region, a trend toward concentration of mining in a few locales, establishment of federal preserves, and ranching becoming the stable economy of the region. Archeological investigations in the Gila forks area fell more to the developing science of archeology. From the time of the establishment of Gila Cliff Dwellings National Monument in 1906 to the mid-1930s, only three studies occurred in the area. Beginning in the 1920s, with the earlier groundwork laid, archeologists began refining their questions to further delineate culture areas, time frames within which the cultures operated, and interaction between established culture areas. This was the primary purpose of the three archeological surveys conducted in the Gila forks region during this period.

1935-1963. This period reflects a doubling of investigations as well as a shift toward government sponsored archeology dealing mainly with the Gila Cliff Dwellings proper. Two works in the 1930s documented the architecture of the cliff dwellings and created a base map of the ruin. This work eventually led to three projects designed to stabilized walls within the ruins damaged by vandals and posing structural problems. By the mid-1950s and 1960s issues involving the future of the national monument resulted in three localized surveys to address boundary changes to the monument and inclusion of other nearby sites. The work of this period culminated in the first and most complete scientific excavation of most of the rooms within Gila Cliff Dwellings.

1964-1991. With the passage of federal laws designed to protect the cultural resources of this country, archeological studies increased during this period, not only throughout the country but also within the Gila forks region. Thirty-nine of the forty projects listed for the area during this period are the result of legislative mandates. Highway salvage archeology took place in the late 1960s when State Route 15 was improved up to the cliff dwellings and excavation of sites again took place in the 1970s when USFS undertakings required investigations at the Heliport and Lagoon sites. Most of the remaining work during this period consisted of survey ahead of planned construction or to meet federal mandates under Executive Order 11593, while efforts to inspect and conserve sites with standing architecture, particularly Gila Cliff Dwellings, increased dramatically in the last decade.

Thus, the history of archeological investigations in the Gila forks region is traceable from the initial period of discovery and description, through establishment of the national monument to protect Gila Cliff Dwellings and certain surrounding archeological sites, to more intensive studies that determined the number and types of sites in the area and how they relate to surrounding culture areas through time. A pattern of multiple (cultural and natural) resource documentation in the very early period to singular archeological sources during the succeeding three periods occurred, with increasing numbers of archeological projects over the last 84 years.

Despite the number of disparate investigations in the Gila forks region, and the even more numerous and more extensive investigations within the immediately surrounding areas (Mimbres, Cliff-Gila, Reserve and Apache Creek areas), the Gila forks region is still somewhat an archeological *terra incognita*.

PROJECT METHODOLOGY

Described below are the methods used during the fieldwork; methods used for the artifact analyses are in Chapter Eight.

FIELD SURVEY METHODS

The project crew surveyed the entire 533 acres of Gila Cliff Dwellings National Monument for cultural resources, including the main unit containing the cliff dwellings and the detached unit containing TJ Ruin. This was accomplished by a combination of walking parallel east-west transects across the northeastern third of the main unit and the TJ Unit and then walking contour transects along the steeper slopes of the main unit. Crews consisted of either one 3-person crew or two 2-person crews spaced no more than 10 m apart. Except for one technician-level crew member, all personnel involved in the fieldwork have from 12 to 25 years experience in archeology.

When crew members located an archeological site, each member performed predetermined tasks ranging from plotting site location to conducting in-field artifact analyses. Documentation of each site consisted of the following:

- Establishment of a site datum for permanent identification. This consists of a 1/4 x 1 x 24-inch steel stake with the State of New Mexico site number stamped in 1/4-inch letters/numbers and sprayed with a clear affixative as a rust inhibitor,

- Completion of a 12-page site form describing the location, environment, physical description and management recommendations for each site,

- A measured map depicting all cultural and natural features of the site and referenced to the site datum,

- In-field analysis sheets on both lithic and ceramic surface artifacts,

- Location of each site on 7.5 minute USGS topographic maps, and

- Location of site boundaries on 1:2400-scale aerial photographs.

Isolated Occurrences (IOs) also were recorded as to location on USGS maps, aerial photographs and on an IO form. Isolated occurrences are single artifacts or very thin scatters of less than 10 artifacts. Examples of all forms used are in Appendixes 2 and 3.

LABORATORY METHODS

To discuss the monument archeology in a larger context, analysists performed a reanalysis of the ceramic and lithic artifacts collected by Don Morris in 1968. Thus, information from sites outside the monument was incorporated into the overall analysis and was conducted on the same level as in the field. This information is in Chapter Eight, showing primarily artifact type, material identification, and temporal and cultural assignment of diagnostic artifacts.

THE SITES

This chapter splits the discussion of archeological sites within the Gila forks region into two sections. This approach is taken for the following reasons. Because NPS management only focuses on sites that fall within the boundaries of the two monument units, the first discussion deals only with those sites that concern NPS management and interpretation. However, it is not possible to discuss sites within the monument without reference to sites outside the monument, i.e., the cultural landscape. Therefore, the second discussion includes information on known sites within the immediate area of the monument and expands the focus of prehistory in the Gila forks area beyond bureaucratic boundaries. The latter discussion incorporates information acquired by Morris in his original survey.

Because of some inconsistencies in the original data, this author elected to modify some categories and counts presented by Morris (1986c:13-19). Here, the author calls Morris' "Chipping Areas" Artifact Scatters as both ceramic and lithic materials occur on many of them. "Pithouse Villages" are termed Pithouse Sites to include those sites that have only a single example of pithouse architecture. "Cliff Shelters" are termed Rockshelters and do not include overhangs containing standing masonry. "Masonry Units" are termed Pueblo Sites and consist of all sites showing evidence of masonry architecture; except for a single granary site. This includes rockshelters containing standing masonry walls. Combined into a single category of Specialized Sites as defined below, are Morris' categories of Checkdams, Pictograph Areas, Rock Wall and Ceremonial Units.

Based on the results of the survey and given the changes described above, prehistoric sites within the monument fall into six site type categories: Pithouse Sites; Pithouse/Pueblo Sites; Pueblo Sites; Rockshelters; Artifact Scatters; and Specialized Sites. Typically, there is some overlap in this scheme as, for example, Pueblo (masonry) sites occur within rockshelters and almost all sites have associated artifact scatters. The overriding character or signature of each site determines its category. For example, rockshelters exhibit many different primary uses through the sample and thus served different as well as multiple uses. Thus, although cliff dwellings, by popular definition, occur in rockshelters, such sites fall under Pueblo Sites as the primary feature of the site tends to be the masonry pueblo constructed within the rockshelter.

ARCHEOLOGICAL RESOURCES WITHIN THE MONUMENT

Crew members recorded 45 prehistoric archeological sites within the confines of the monument, ten more than previously recorded within the NPS boundaries. Of the newly recorded sites, eight are small light artifact scatters, primarily lithic debris, one is a small stone circle atop a high cliff, and one is a small two or three room pueblo. Additionally, 27 isolated occurrences were recorded, providing information on the more ephemeral use of the monument area. Although a light scatter of modern artifacts spill into the monument near the northwest corner, associated with past camping (?) activities near Grudging cabin, these were not analyzed as part of this survey. While limited amounts of modern artifacts or features occur at several prehistoric sites (particularly campfire rings), no exclusively historical sites occur within the monument boundaries.

SITE DESCRIPTIONS

LA4913

Site Type: Rockshelter
Other Designation: M-34
Site Size: 17.2 m^2 (0.004 ac)
Elevation: 1761 m (5780 ft)
Estimated Number of Surface Rooms: 1
Date Range: Unknown
Estimated Number of Subsurface Structures: None
Observations: Undisturbed except for natural erosion and spall deposition. Some damage occurred at this site during the May 1991 forest fire. Fire crews working the ridge tops to either side created a foot trail through the site. Damage is minor.

Comments: A very small alcove situated in an isolated outcrop of andesite on a steep canyon slope (Figures 12 and 13). A smaller overhang, about 0.5 m high, occurs immediately to the southwest, which apparently was never occupied. The bottom course of a masonry wall is still evident across the larger shelter. Ceiling spalls are numerous within the shelter and obscure the floor. Although Morris noted "smoked roofs" in both overhangs, this was not obvious during this recording. However, crew members noted a number of pieces of charcoal within the alcove. The faint remains of a possible pictograph occur on the southwest wall within the shelter. The site contained only one unidentified sherd and a single stone flake.

LA10006

Site Type: Pithouse
Elevation: 1765 m (5790 ft)
Site Size: 60000 m^2 (14.8 ac)
Date Range: A.D. 550-1150
Estimated Number of Surface Rooms: 1(?)
Estimated Number of Subsurface Structures: 16
Observations: Most of the site is just outside the western boundary of the TJ Unit on USFS land. The portion just inside the TJ Unit is undisturbed but probably has no subsurface structures. The portion outside the TJ Unit has been disturbed by construction of the "bone yard", a garbage pit, powder and blasting cap magazines and an air quality monitoring station.

Comments: There is an extensive pithouse village occupying the slopes of a southwest facing ridge west of TJ Ruin (Figures 14 and 15). The site location is above the Gila River just below the confluence of the West and Middle forks. Surfaceartifacts are lightly scattered over the site and most pithouse locations are not obvious. One large pithouse depression occurs near the top of the ridge, just west of the parking area for the "bone yard". Surface artifact scatter continues from this pitstructure westward into the TJ Unit.

LA10041

Site Type: Pueblo
Elevation: 1757 m (5765 ft)
Site Size: 6650 m^2 (1.6 ac)
Date Range: A.D. 550-1250
Estimated Number of Surface Rooms: 5
Estimated Number of Subsurface Structures: None
Observations: Undisturbed except for minor natural erosion.

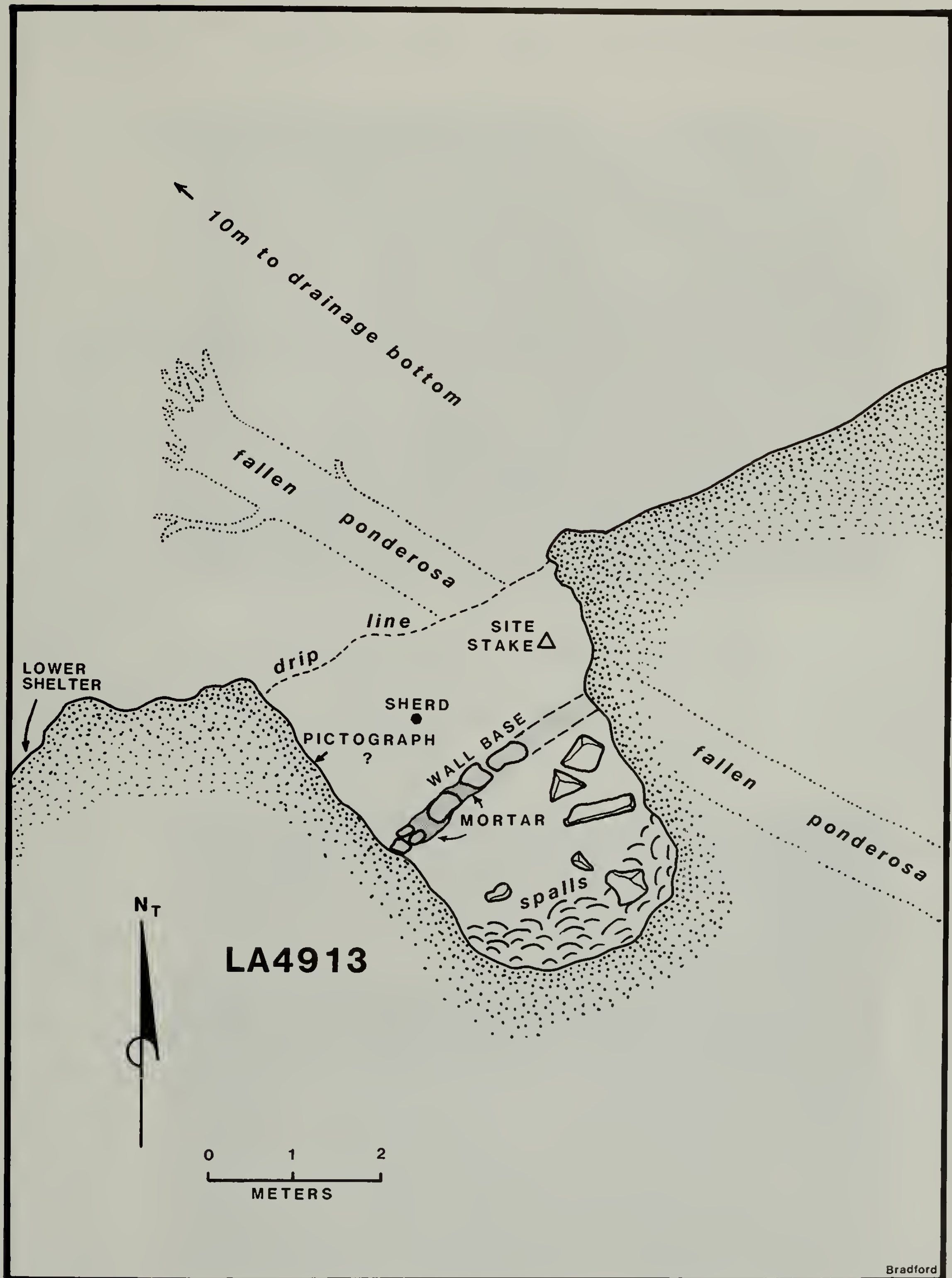


FIGURE 12: Site Map of LA4913.

FIGURE 13: LA4913, A Small Alcove Site.

FIGURE 14: LA10006 in the Foreground, TJ Ruin and the Gila River in the Background.

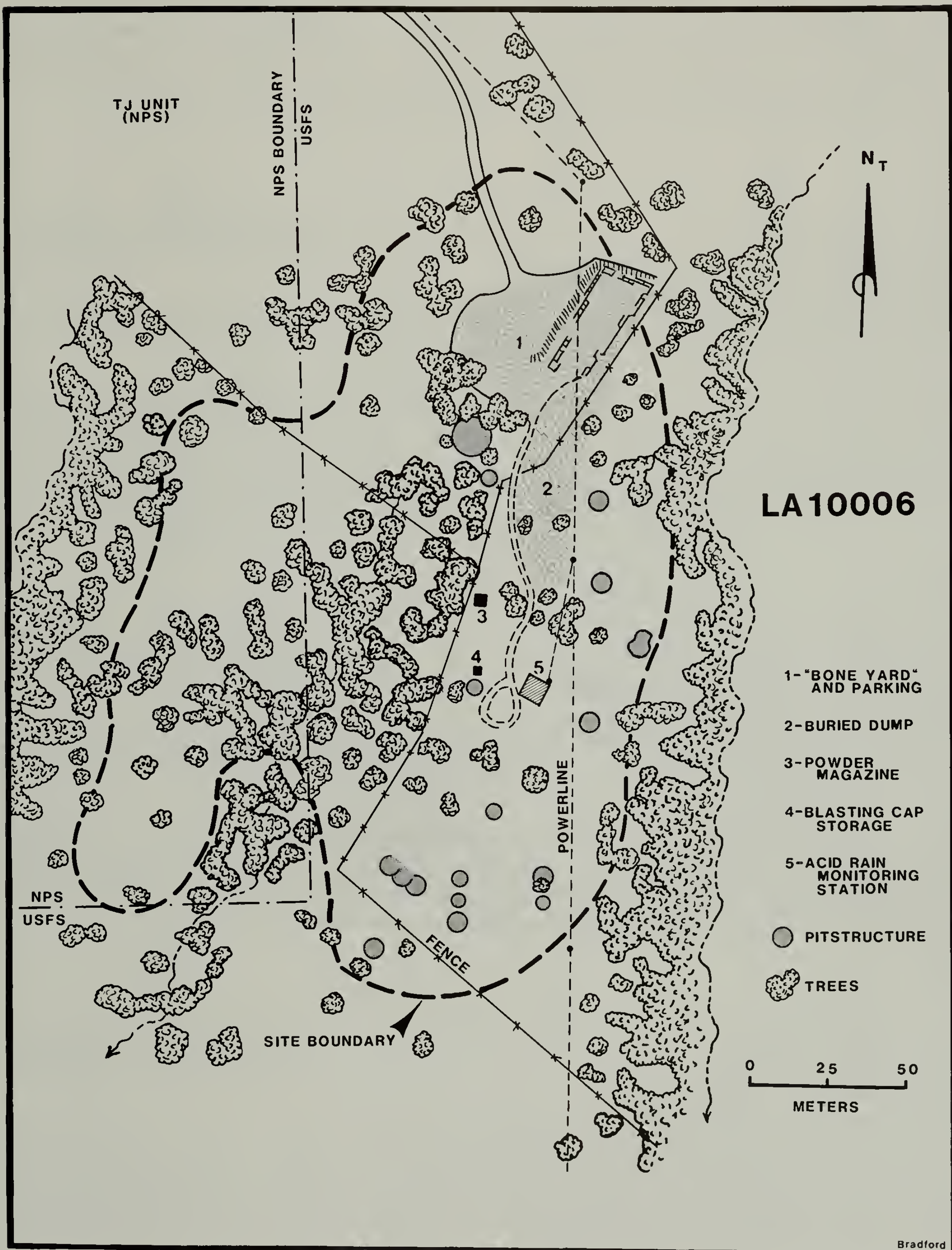


FIGURE 15: Site Map of LA10006.

Comments: A small linear roomblock situated on a low ridge within the canyon bottom of the West Fork well back from the flood plain (Figure 16). An additional row of rooms may be attached to the northeastern half of the roomblock. A light scatter of surface artifacts delineates the oval trash area about 10 m southeast of the pueblo, and what may be a disturbed detached room or an activity area occurs about 25 m to the south.

LA10042

Site Type: Pithouse
Elevation: 1792 m (5880 ft)
Site Size: 19292 m^2 (4.8 ac)
Date Range: A.D. 550-1150
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: 2-4
Observations: Mostly undisturbed except for erosion cutting into the eastern edge of the site, and some evidence of on-site camping and livestock grazing.

Comments: The entire ridge top on which the site sits has an extensive surface artifact scatter, continuing southeast to the promontory that forms the end of the ridge overlooking the West Fork of the Gila River (Figure 17). The saddle connecting the ridge with the higher ridge to the north is the site center as evidenced by two pithouse depressions (with more expected) and a small trash area southeast of the depressions being exposed by arroyo cutting.

LA10044

Site Type: Pithouse
Elevation: 1781 m (5845 ft)
Site Size: 9860 m^2 (2.4 ac)
Date Range: A.D. 550-1200
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Rooms: 1
Observations: Undisturbed in 1989. The May 1991 forest fire ignited three small areas on the southern periphery of the site and fire suppression activities slightly damaged this area of the site.

Comments: A large site situated on a bench immediately overlooking the West Fork of the Gila River (Figure 18). Surface artifacts are lightly scattered over the site area. One large, circular pithouse depression (about 12 m diameter) is near the center of the site and, while no other depressions are obvious, two or three other pitstructures may occur on-site.

LA10045

Site Type: Pueblo/Pithouse
Elevation: 1771 m (5810 ft)
Site Size: 10500 m^2 (2.6 ac)
Date Range: A.D. 550-1150
Estimated Number of Surface Rooms: 14
Estimated Number of Subsurface Structures: 2-3
Observations: Undisturbed except for erosion along the northern edge in 1989. The May 1991 forest fire burned over this site. Actual fire damage was minimal. Fire suppression activities resulted in a fire line through the pitstructure depression and northeastward along the west side of the roomblock. Damage was minimal as depth was kept to a couple of centimeters along the fire line.

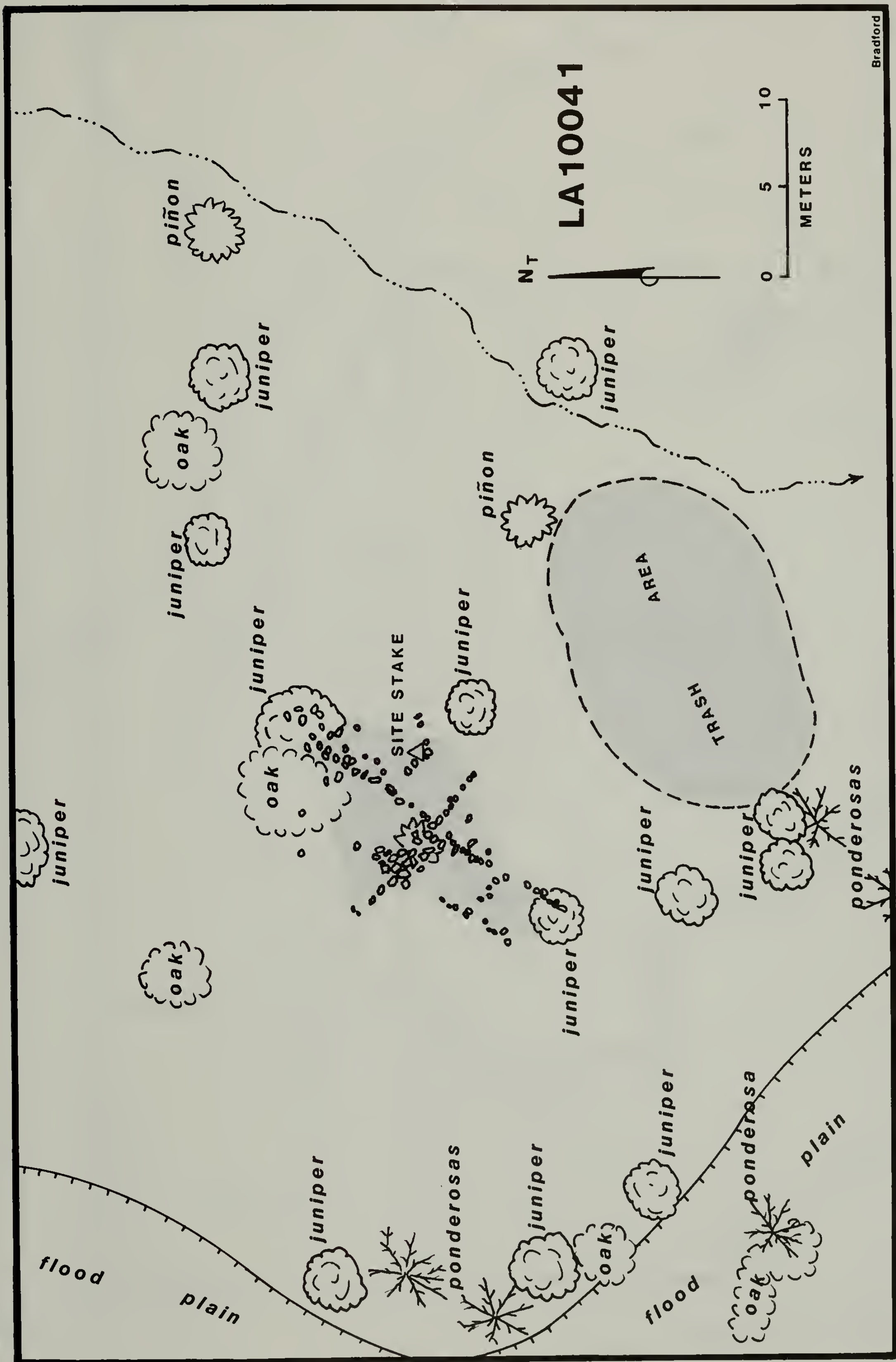


FIGURE 16: Site Map of LA 10041.

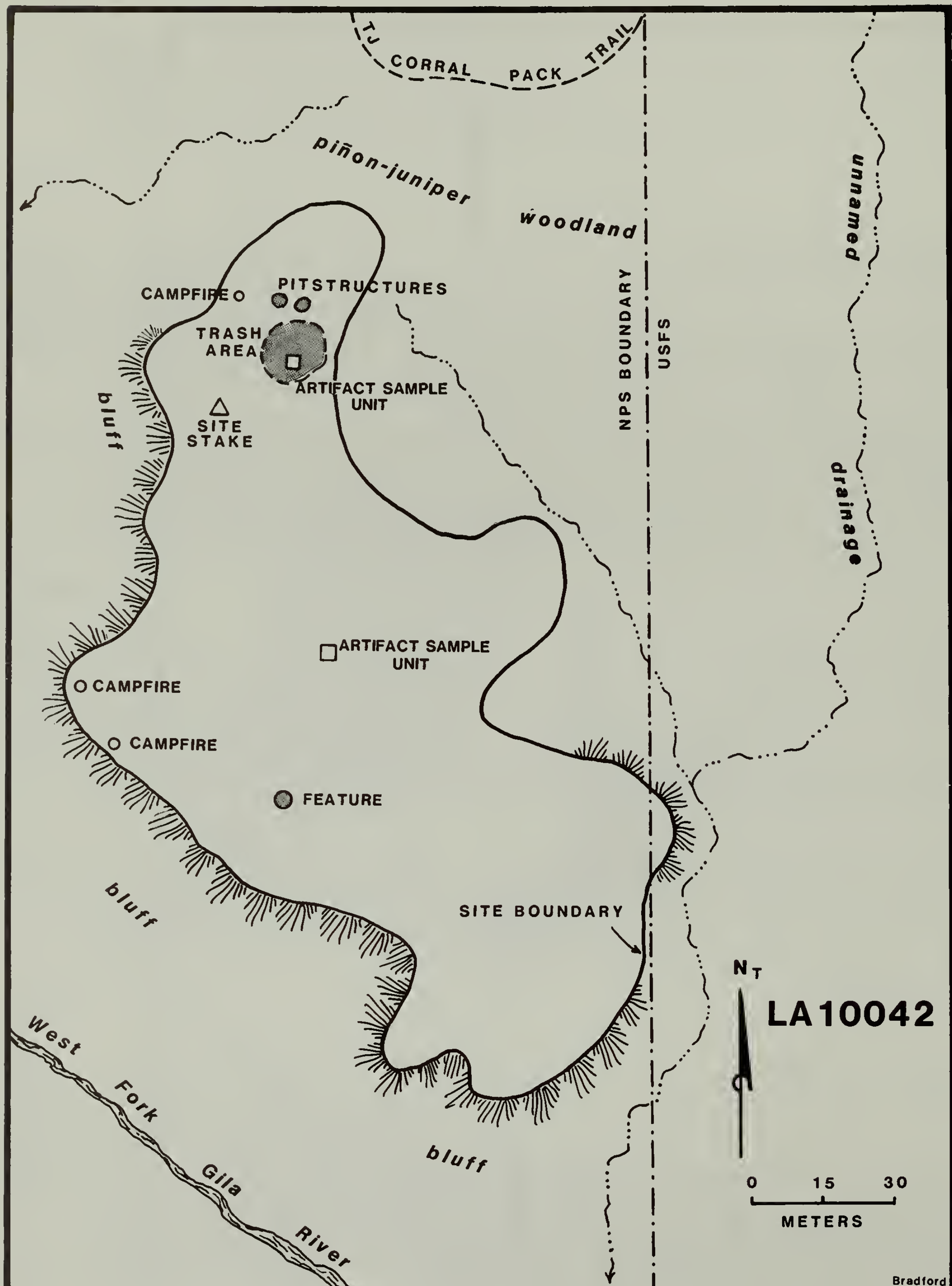


FIGURE 17: Site Map of LA10042.

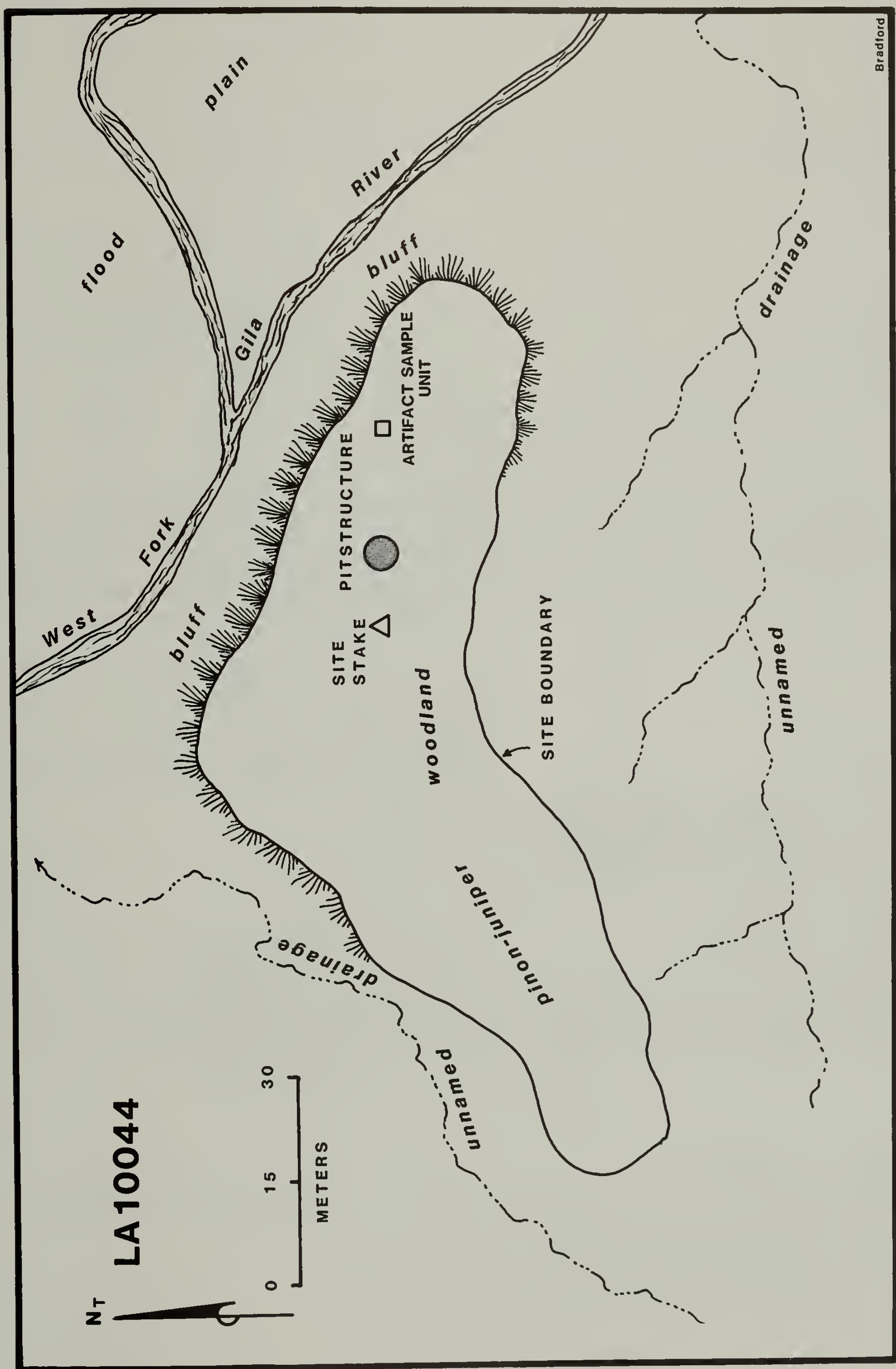


FIGURE 18: Site Map of LA 10044.

Comments: A rectangular roomblock containing at least 14 rooms and perhaps a small enclosed plaza (Figures 19 and 20). Obvious trash areas occur immediately in front (northeast) and immediately northwest of the roomblock. Surface artifacts are lightly scattered over the remainder of the site. A very large (18 m diameter) depression occurs 20 m to the west of the roomblock and two other smaller depressions (about 10 m diameter each) may exist the same distance to the south and southwest of the roomblock. At least two detached wall segments occur south of the roomblock. The site is on a bench overlooking the West Fork immediately to the north.

LA10046

Site Type: Rockshelter
Site Size: 48 m^2 (0.01 ac)
Elevation: 1804 m (5920 ft)
Date Range: Unknown
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: A small alcove situated at the base of a vertical cliff and below the end point of a ridge. Very little soil occurs on the ledge that forms the floor of the shelter.

Comments: A shallow overhang at the end of a ridge approximately 15 m below the canyon rim directly across from Gila Cliff Dwellings (Figures 21 and 22). No artifacts were found in association with the alcove. Originally recorded by Morris as a "smoke blackened rock shelter...[with]...no artifacts and no architecture", this alcove does not provide much shelter from the elements and apparently Morris decided to record it as a site on the basis of the blackened ceiling.

LA10047

Site Type: Granary
Site Size: 28 m^2 (0.007 ac)
Elevation: 1816 m (5960 ft)
Date Range: Unknown
Estimated Number of Surface Rooms: One storage unit
Estimated Number of Subsurface Structures: None
Observations: Due to the extreme slope of the overhang in which this feature was built, most of the structure has fallen out and eroded away.

Comments: There is a wall remnant containing six undressed stones set in adobe mortar on a sloping ledge within a small overhang (Figures 23-25). Only this portion of the south wall remains; all others have since fallen from place. Originally, the storage unit may have enclosed about 3 m^3 of space. Remaining mortar is gravelly and contains many beetle galleries. Dark staining occurs on the back and roof of the overhang. No associated artifacts were found.

LA10048

Site Type: Specialized site (burial ?)
Site Size: 36 m^2 (0.009 ac)
Elevation: 1795 m (5890 ft)
Date Range: 1600-1900 (est.)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Rooms: None
Observations: A small shallow low ledge overhang with a very shallow deposit of gravelly soil across the bedrock floor.

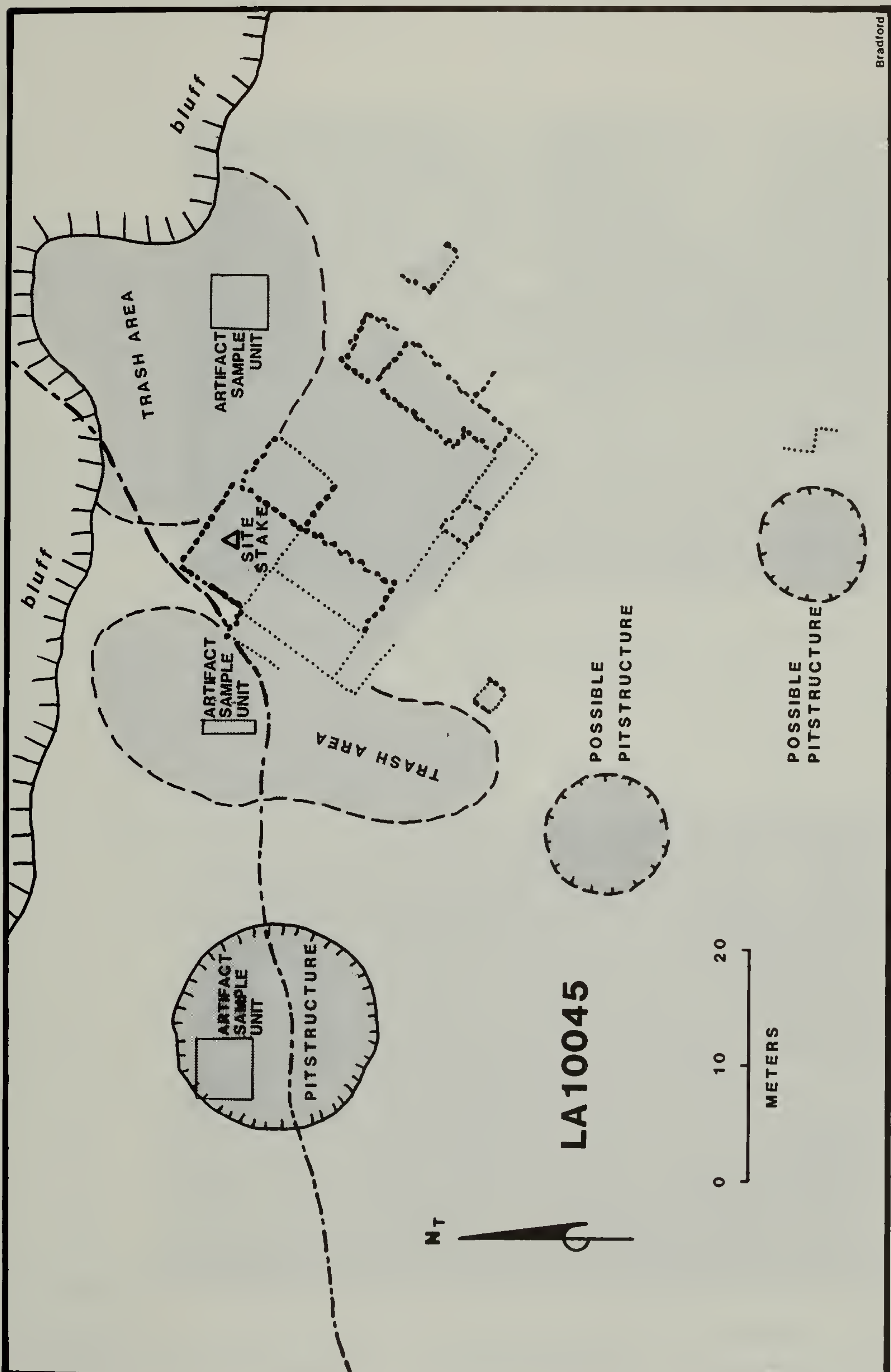


FIGURE 19: Site Map of LA 10045.

FIGURE 20: LA10045, Water Marks the Center of the Large Depression on This Site.

FIGURE 21: LA10046, Note Blackened Ceiling of This Small Rockshelter.

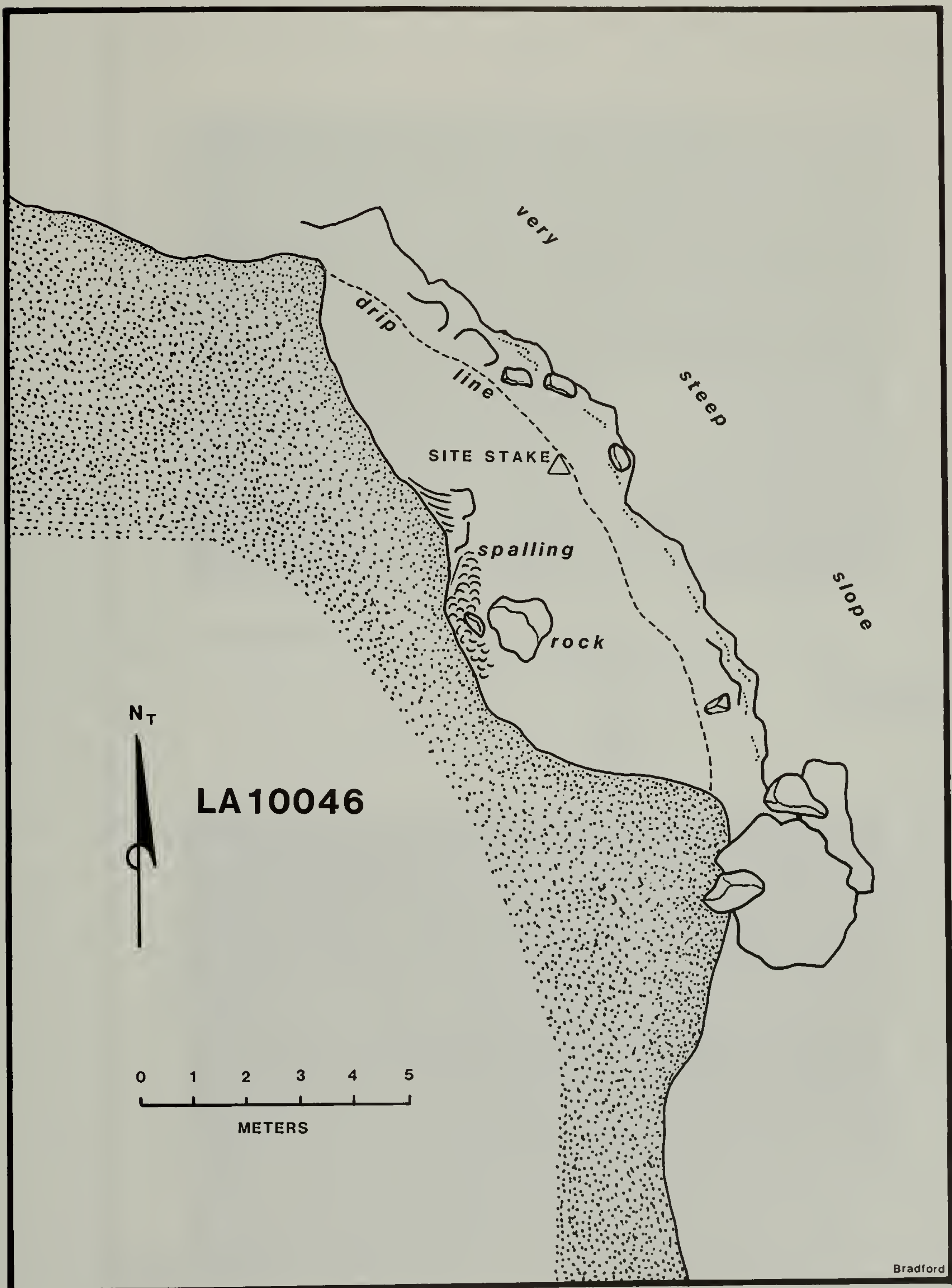


FIGURE 22: Site Map of LA10046.

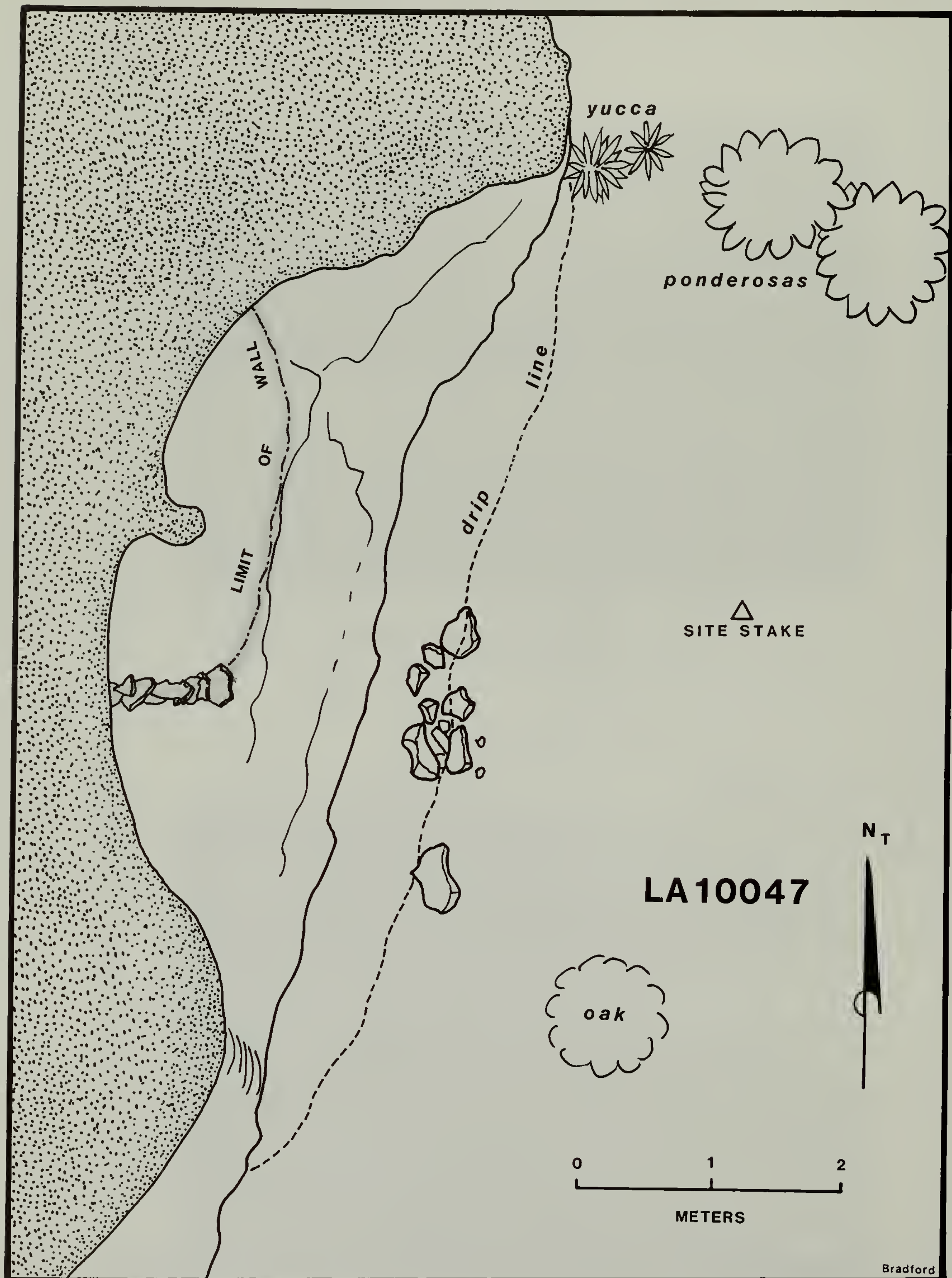


FIGURE 23: Site Map of LA10047.

FIGURE 24: LA10047, L. Heacock Examines Masonry Remains of Granary.

FIGURE 25: LA10047, Close-up of Wall Remnants Beneath Overhang.

Comments: The site is on a small ledge overhang containing the remains of yucca stalks bound together to form a platform or frame (Figures 26 and 27). Several unworked rocks and clumps of dried grass occur scattered around the platform. Only one other artifact was noted; a round river cobble with hematite staining on one end. The frame is formed of six split stalk pieces, five of which are or were formerly tied to a single lateral piece (Figure 28). Don Morris reported this to be the remnants of an Apache burial, the human remains of which were removed at some unknown time in the past.

LA10049 - Javelina House

Site Type: Pueblo (cliff dwelling) — Elevation: 1823 m (5980 ft)
Site Size: 400 m² (0.1 ac) — Date Range: A.D. 750-1250
Estimated Number of Surface Rooms: 2
Estimated Number of Subsurface Rooms: None
Observations: Essentially undisturbed except for minor damage in recent years from javelinas bedding down in the cliff dwelling room.

Comments: This site is a long, shallow rockshelter containing a large masonry room in very good condition and remnants of a small stacked rock wall at the northeastern end of the rockshelter (Figures 29 and 30). The floor of the shelter contains a deep deposit of gravely soil that may bury additional features. Artifacts are scarce across the site, even down the talus slope in front of the main overhang. The masonry room contains a single large room (19.6 sq. m) with two doorways, a vent hole and viga sockets (?) near the top of the southern wall (Figure 31). Much of the shelter wall and ceiling are stained black. Several inscriptions occur along the back wall, including the initials "E", "FN", "A", and "WF" with the date "1921".

LA10050 - The Pictograph Site

Site Type: Specialized Site (rock art) — Elevation: 1813 m (5950 ft)
Site Size: 45 m² (0.01 ac) — Date Range: A.D. 550-1300
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: A bedrock ledge with a very shallow overhang. Evidence of a modern campfire occurs in the western section of the overhang.

Comments: A site with a small rock art panel in a shallow overhang about 8 m directly above the bottom of Cliff Dweller Canyon (Figure 32). All rock art elements are pictographs consisting of three (possibly four) red bird motifs poised on the apexes of three stepped pyramids or tabletas, with a solid red line connecting the bases (Figures 33 and 34). About 50 cm to the west and at about the same level, in an area where much of the wall has spalled off, are the remains of one bird head and a solid horizontal line executed in black.

LA10052

Site Type: Pueblo — Elevation: 1856 m (6090 ft)
Site Size: 9500 m² (2.3 ac) — Date Range: A.D. 550-1150
Estimated Number of Surface Rooms: 6
Estimated Number of Subsurface Structures: None

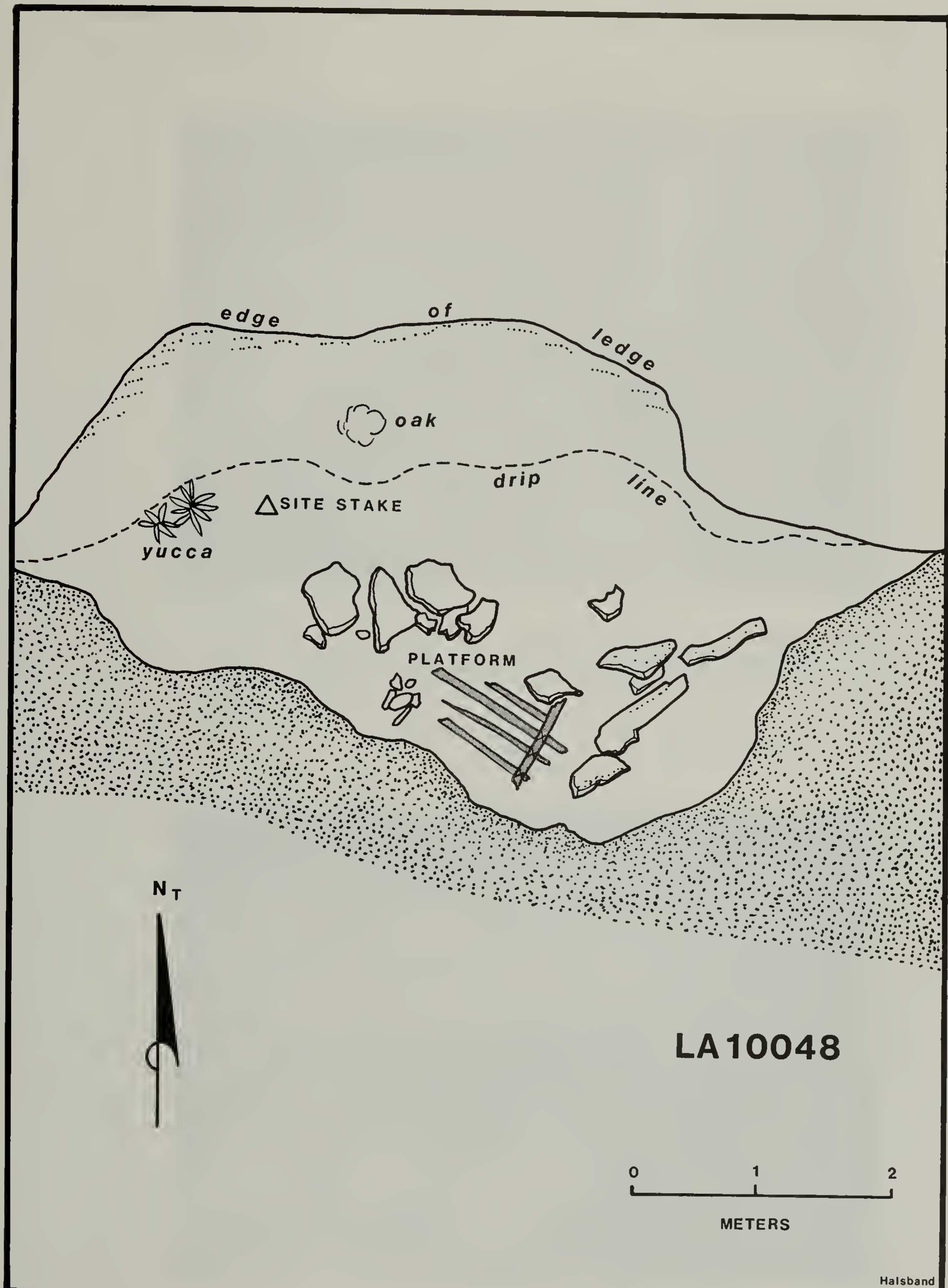


FIGURE 26: Site Map of LA10048.

FIGURE 27: LA10048, L. Heacock Climbs to Ledge Containing Remains of Platform/Frame and Enclosing Wall.

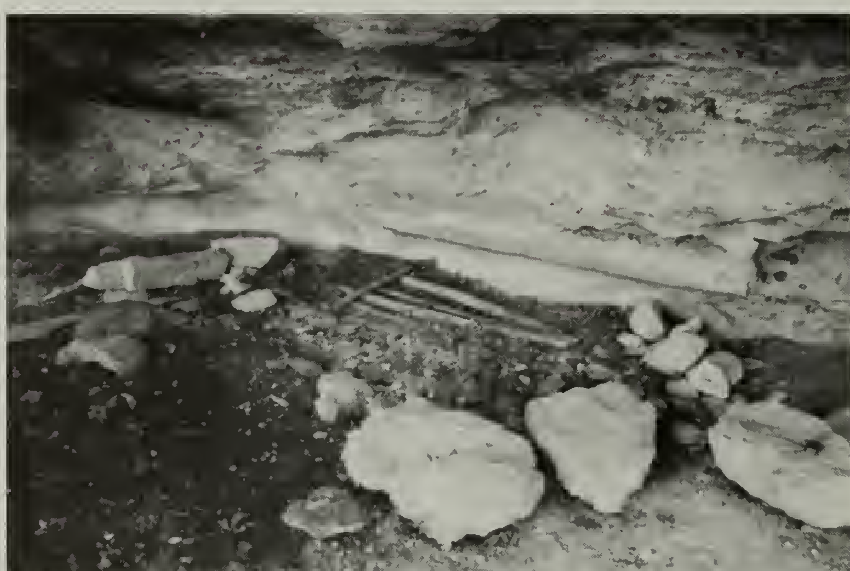


FIGURE 28: LA10048, Close-up of Wooden Platform/Frame and Associated Rocks.

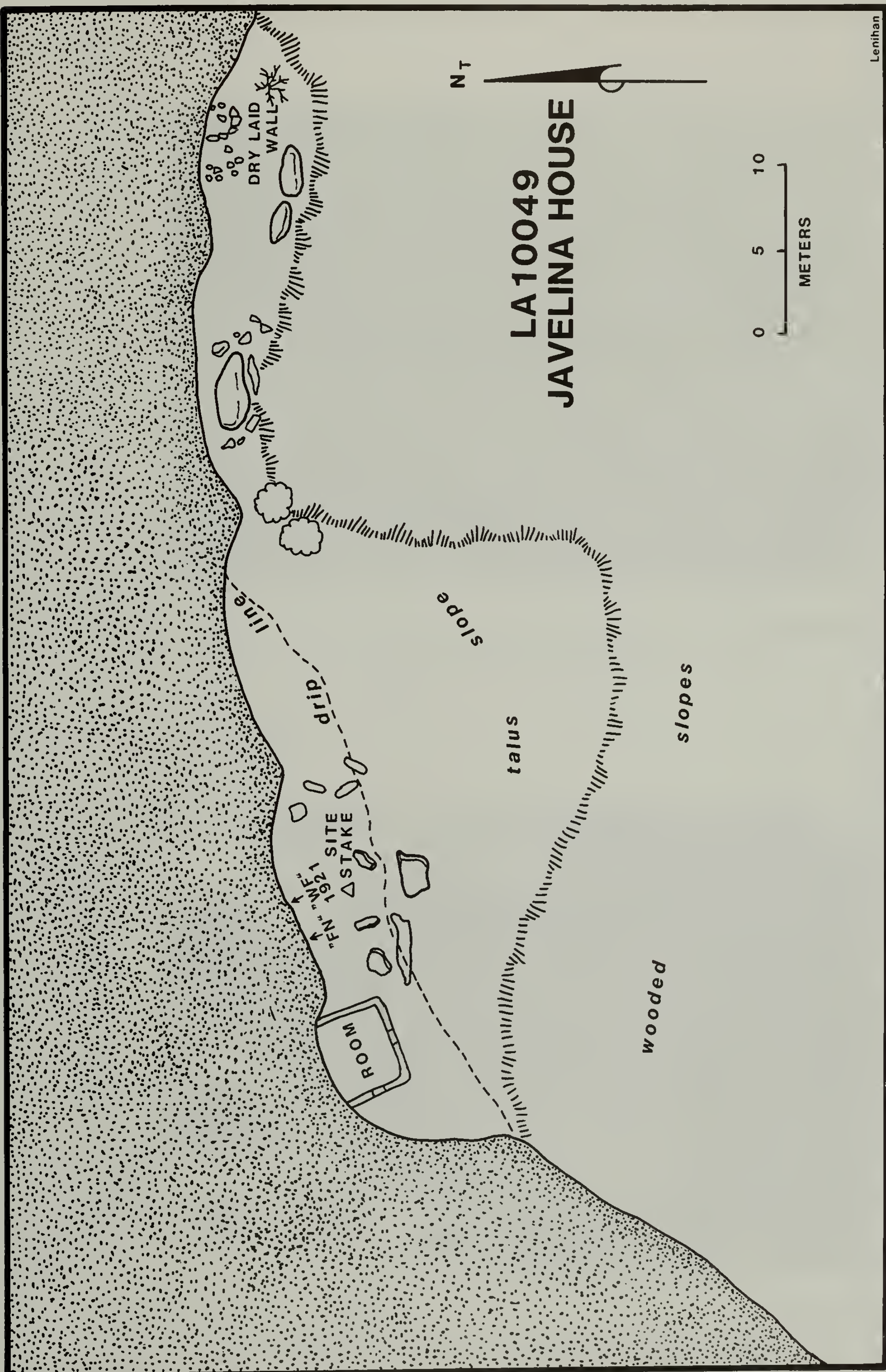


FIGURE 29: Site Map of LA 10049.

FIGURE 30: LA10049, View Northwest of Javelina House, a Single-Room Cliff Dwelling.

FIGURE 31: LA10049, Close-up of Javelina House Showing Masonry Style, South Door and Ventilator Holes.

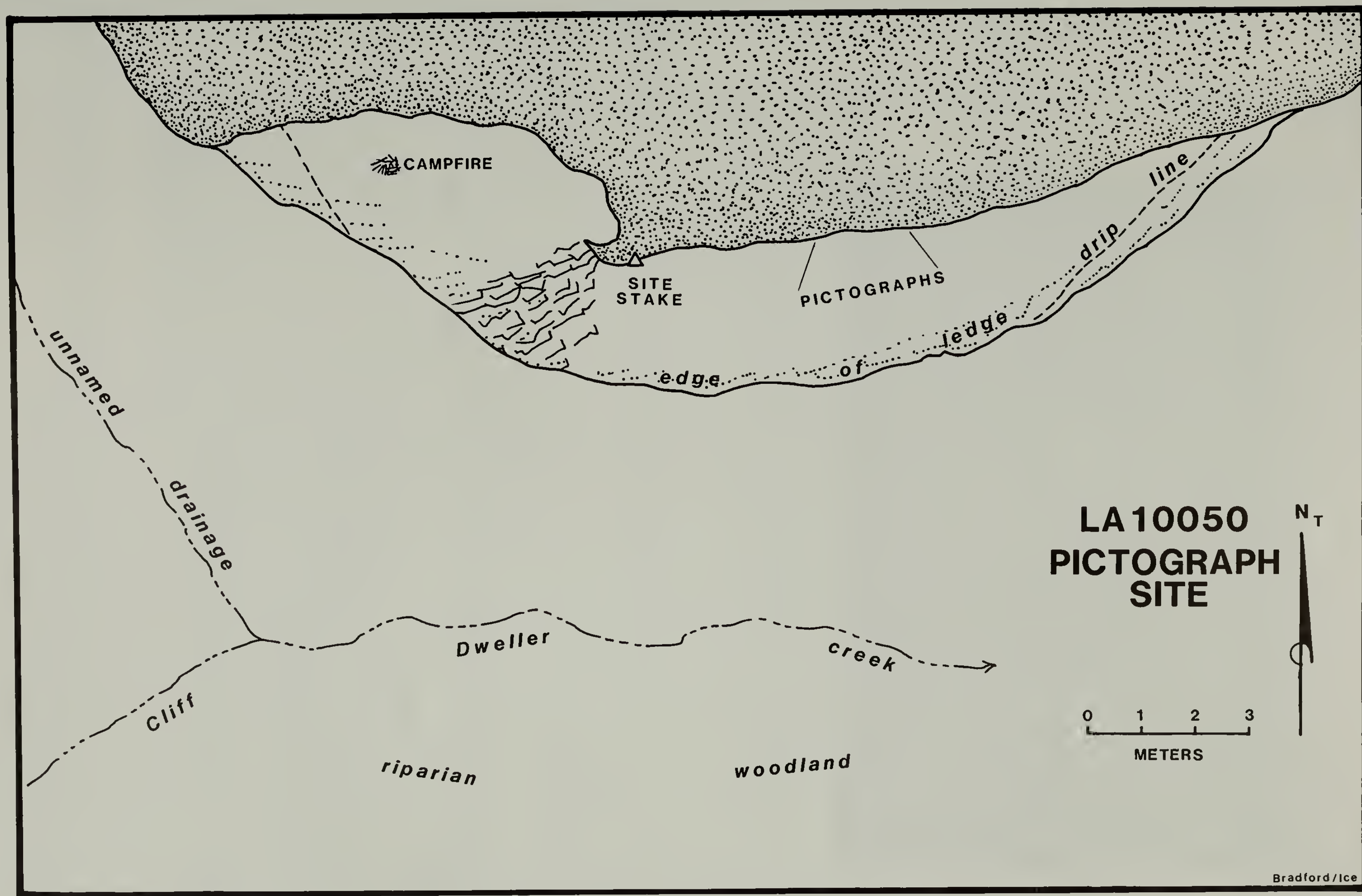


FIGURE 32: Site Map of LA 10050.

FIGURE 33: LA10050, Close-up of Bird Pictograph.

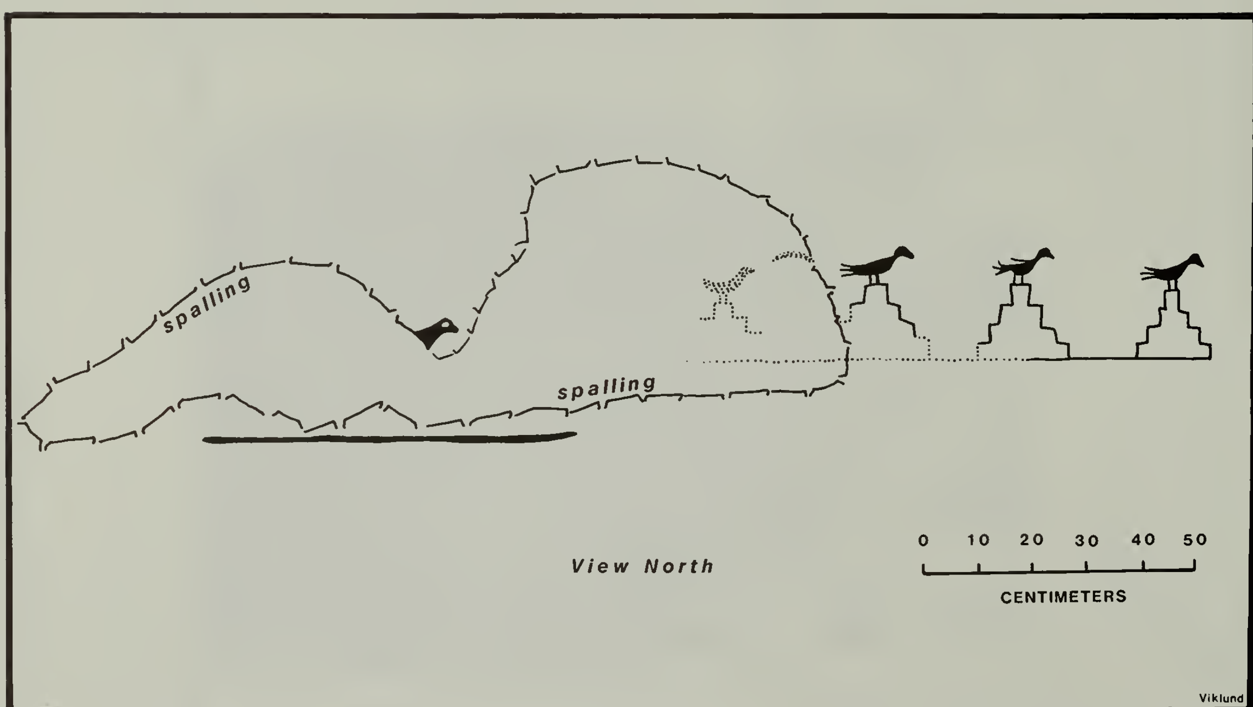


FIGURE 34: LA10050, Scaled Drawing of Complete Pictograph.

Comments: This small pueblo roomblock is associated with an extensive artifact scatter in the higher elevations of the southern quadrant of the main unit of the monument (Figure 35). The artifact scatter is light but covers a large area. The roomblock and full dimensions of the site were not originally recorded by Morris, probably because the roomblock looks like a rock outcrop and the surface artifact scatter thins out to the north. Ceramics are quite abundant in the immediate vicinity of the roomblock. The site is downslope from LA10055 and in the same area as LA10053 and LA10075.

LA10053

Site Type: Specialized site (check dams) — Elevation: 1842 m (6045 ft)
Site Size: 825 m^2 (0.2 ac) — Date Range: A.D. 750-1250
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: All the check dams have been breached and much of the soil in the drainage bottom removed down to bedrock.

Comments: The check dams consist of a series of eight rock alignments placed across a small drainage on the eastern slope of the ridge top in the southeastern quadrant of the main unit (Figures 36 and 37). The lowermost alignment is on the eastern boundary of the unit with all other alignments upslope and to the west. There may be some question as to whether some of these are cultural constructions or natural alignments of stone as exposed in the bedrock planes of the immediate area. Morris noted the same thing when he originally recorded the site. He also noted more erosion on the northern slope of the drainage and no evidence of check dams on that slope.

LA10055

Site Type: Pueblo — Elevation: 1859 m (6100 ft)
Site Size: 3600 m^2 (0.9 ac) — Date Range: A.D. 550-1150
Estimated Number of Surface Rooms: 5-8
Estimated Number of Subsurface Structures: None
Observations: Two rooms within this small pueblo have been damaged by three vandal potholes. Morris noted this condition in 1968. No other damage has occurred since that time.

Comments: This is a small, squarish unit pueblo situated on the crest of a narrow ridge overlooking the southeastern quadrant of the main unit of the monument (Figure 38). Five definite rooms are apparent and interior divider walls may be present in two of the larger rooms, making as many as seven rooms possible. What appears to be a small plaza or work area occupies the southeastern corner of the pueblo. Wall fall around the southwest corner of the roomblock is indicative that substantial masonry existed in this portion of the pueblo although no more than one story would have been built. Masonry is unworked Gila Conglomerate rocks acquired on-site from exposed bedrock. A moderately heavy artifact scatter surrounds the roomblock and spills downslope to the north, east and south. The ridge is heavily wooded and much of the site obscured by vegetation.

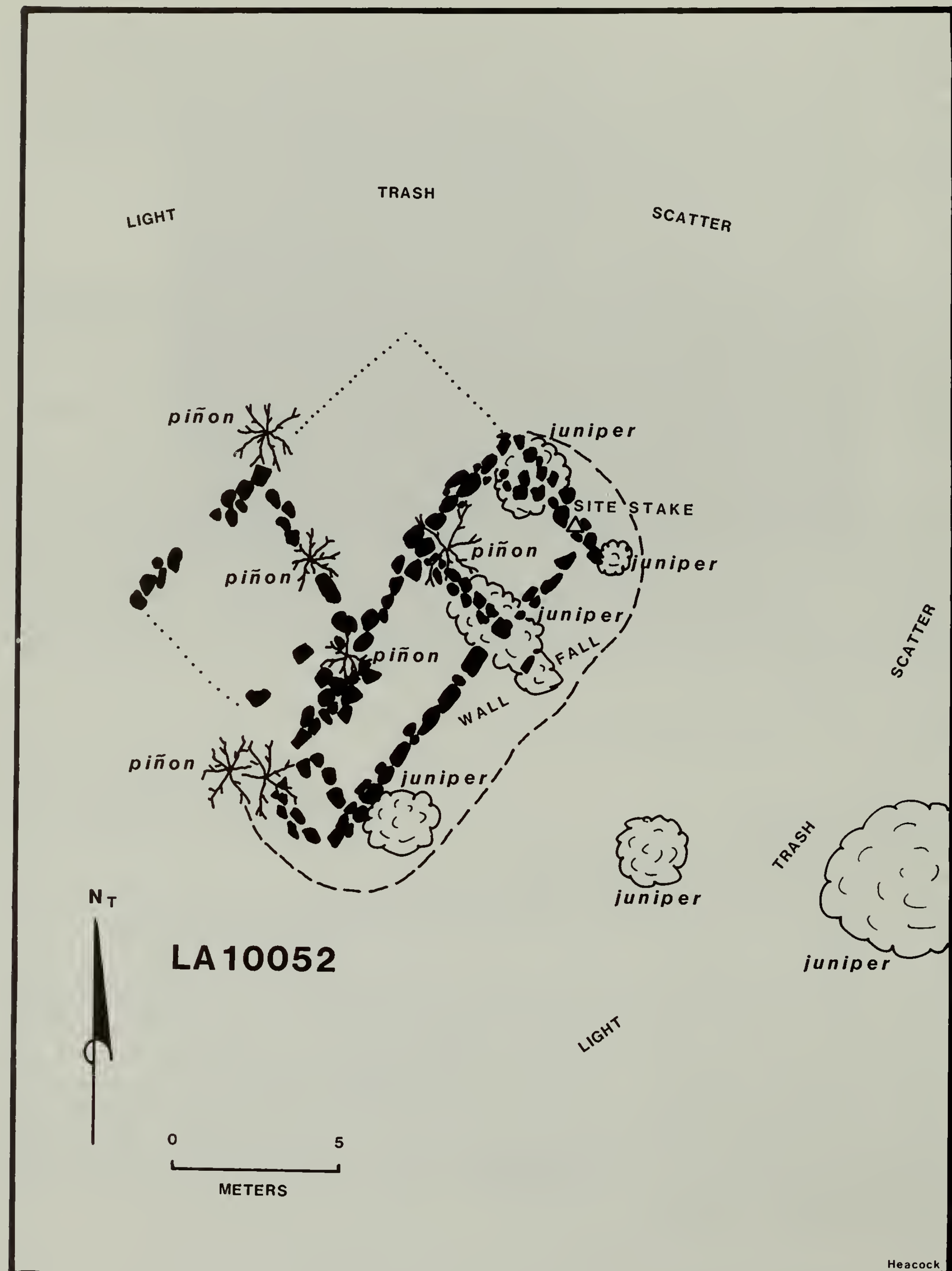


FIGURE 35: Site Map of LA10052.

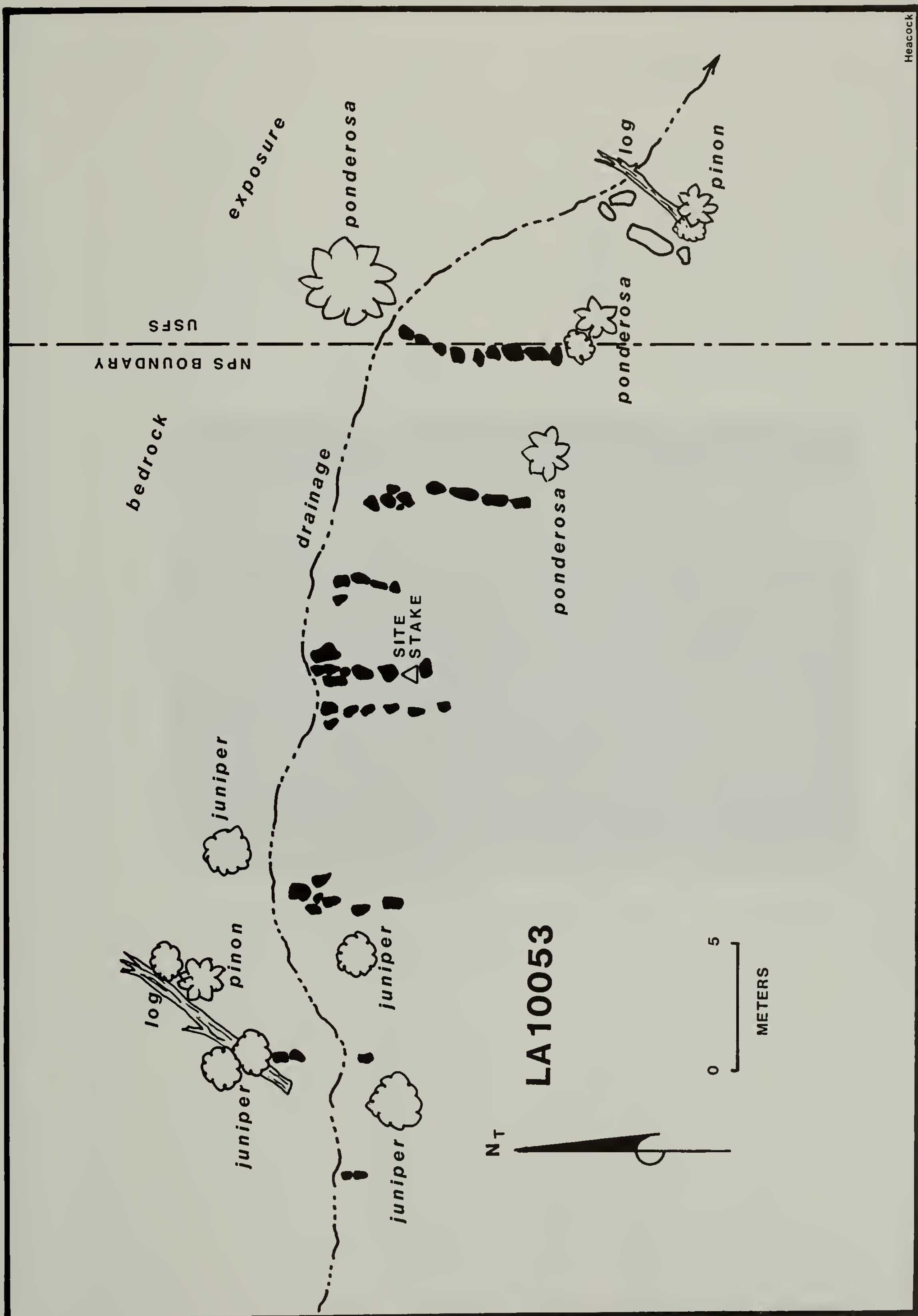


FIGURE 36: Site Map of LA 10053.

FIGURE 37: LA10053, View Up Drainage with Stacked Rock of Check Dam in Foreground.

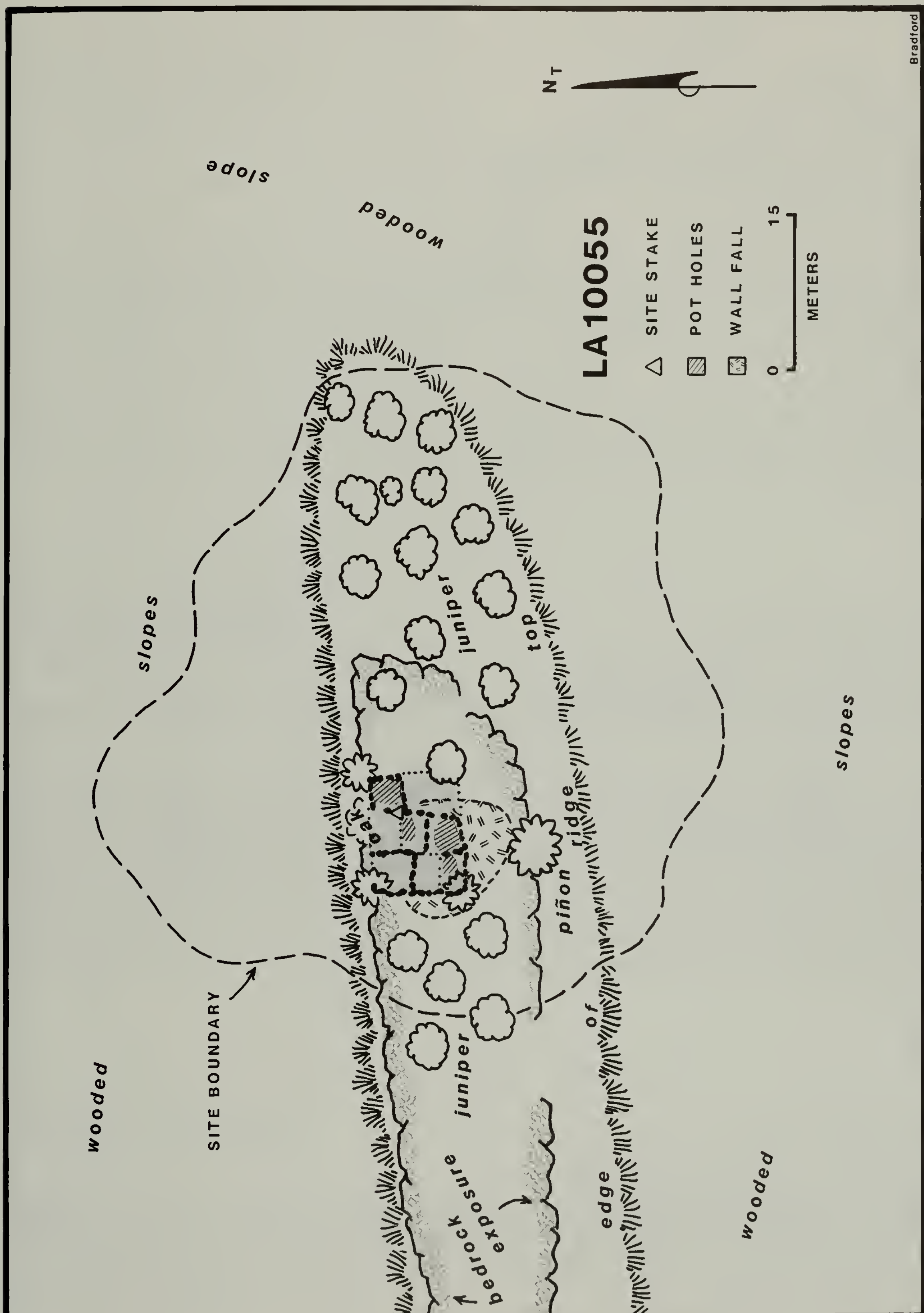


FIGURE 38: Site Map of LA 10055.

LA10056

Site Type: Rockshelter
Site Size: 88 m^2 (0.02 ac)
Estimated Number of Surface Rooms: 2
Estimated Number of Subsurface Structures: None
Elevation: 1827 m (5995 ft)
Date Range: A.D. 1150 & 1600-1900

Observations: Relatively undisturbed rockshelter site. Pack rat nesting appears to be the biggest site damage.

Comments: This rockshelter is a long, very narrow overhang that provides limited protection from the elements and a good view down canyon from its location about half way up the western canyon wall of Cliff Dweller Canyon (Figures 39 and 40). Access to both the canyon bottom and the canyon rim is possible from the site. The site has a good view of Gila Cliff Dwellings just down canyon. Two stacked rock features are indicative of previous activity within the overhang and may relate to Apache use of the site. The northernmost feature measures about 1.5x2 m and the more southern one measures about 2 m^2. Morris collected at least 10 Apache sherds from the site but noted only three prehistoric sherds. The site represents a limited use and activity locale both prehistorically and during the Apache occupation.

LA10057

Site Type: Rockshelter
Site Size: 240 m^2 (0.06 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Elevation: 1801 m (5910 ft)
Date Range: A.D. 750 & 1600-1900

Observations: One large pothole and a modern campfire ring indicative of modern site damage; Morris noted the pothole.

Comments: The site is a small but well-developed rockshelter about 3 m deep and about 3 m high within the dripline (Figures 41-43). There is enough protected area within the shelter to indicate probable buried features. Morris noted the pothole may have been dug into a storage cist and that another such feature may occur at the southern end of the shelter. No surface architecture is present although several large rocks lay scattered across the shelter surface. Smoke blackening occasionally occurs across the ceiling and clumps of dried grass and ponderosa bark add credence to the occurrence of storage cists. This site apparently was used as a storage and work area prehistorically and similarly during the Apache occupation of the area.

LA10058

Site Type: Rockshelter
Site Size: 728 m^2 (0.2 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: 6
Elevation: 1804 m (5920 ft)
Date Range: A.D. 550-1000

Observations: Undisturbed except for one vandalized subsurface feature and one modern campfire ring within the shelter. The vandalized area does not appear in a photograph taken by Dale King in 1955. The pothunting took place between 1955 and 1968 when Don Morris noted it during his survey.

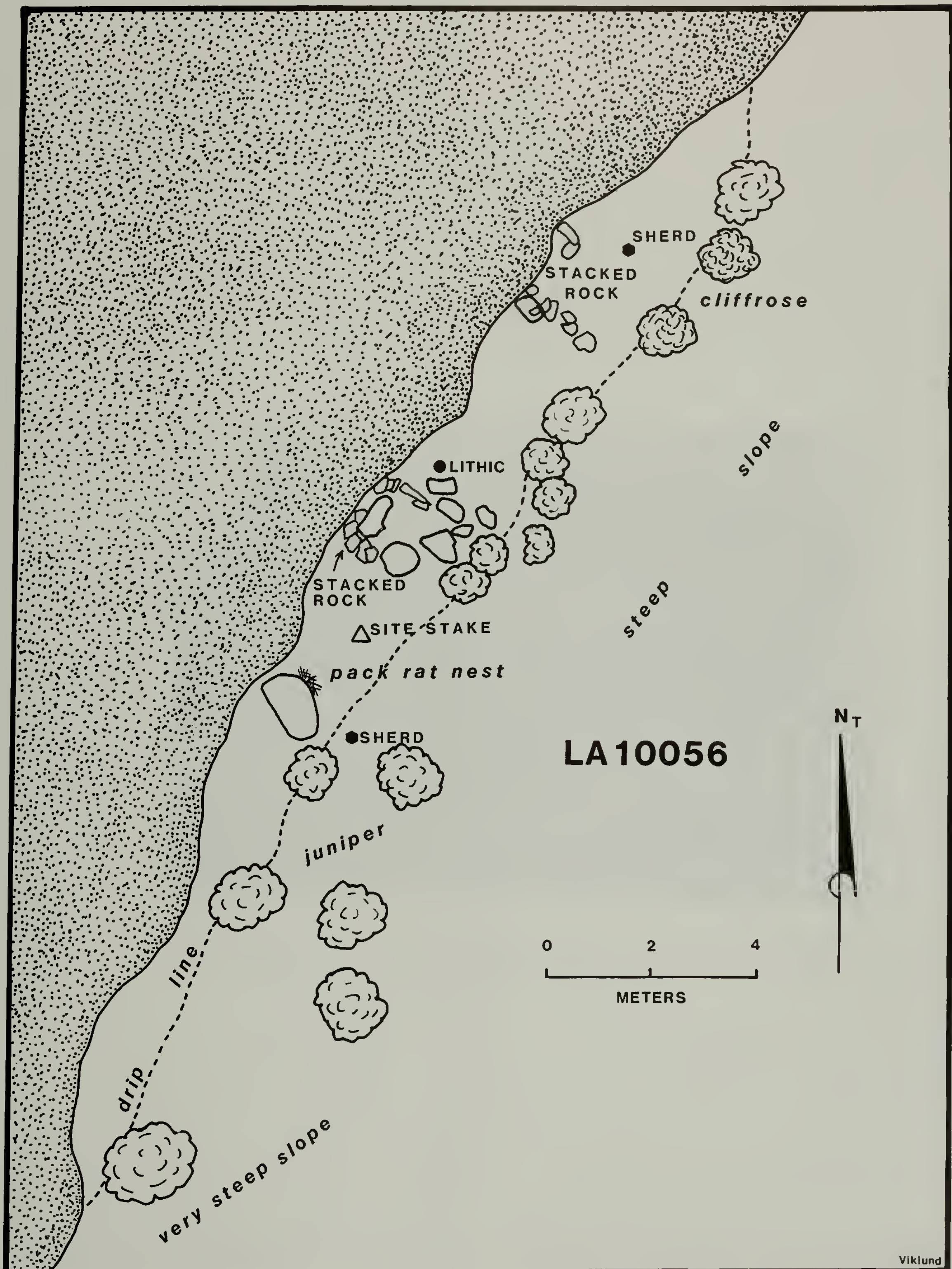


FIGURE 39: Site Map of LA10056.

FIGURE 40: LA10056, View Along Cliff Base Showing Shallow Rockshelter.

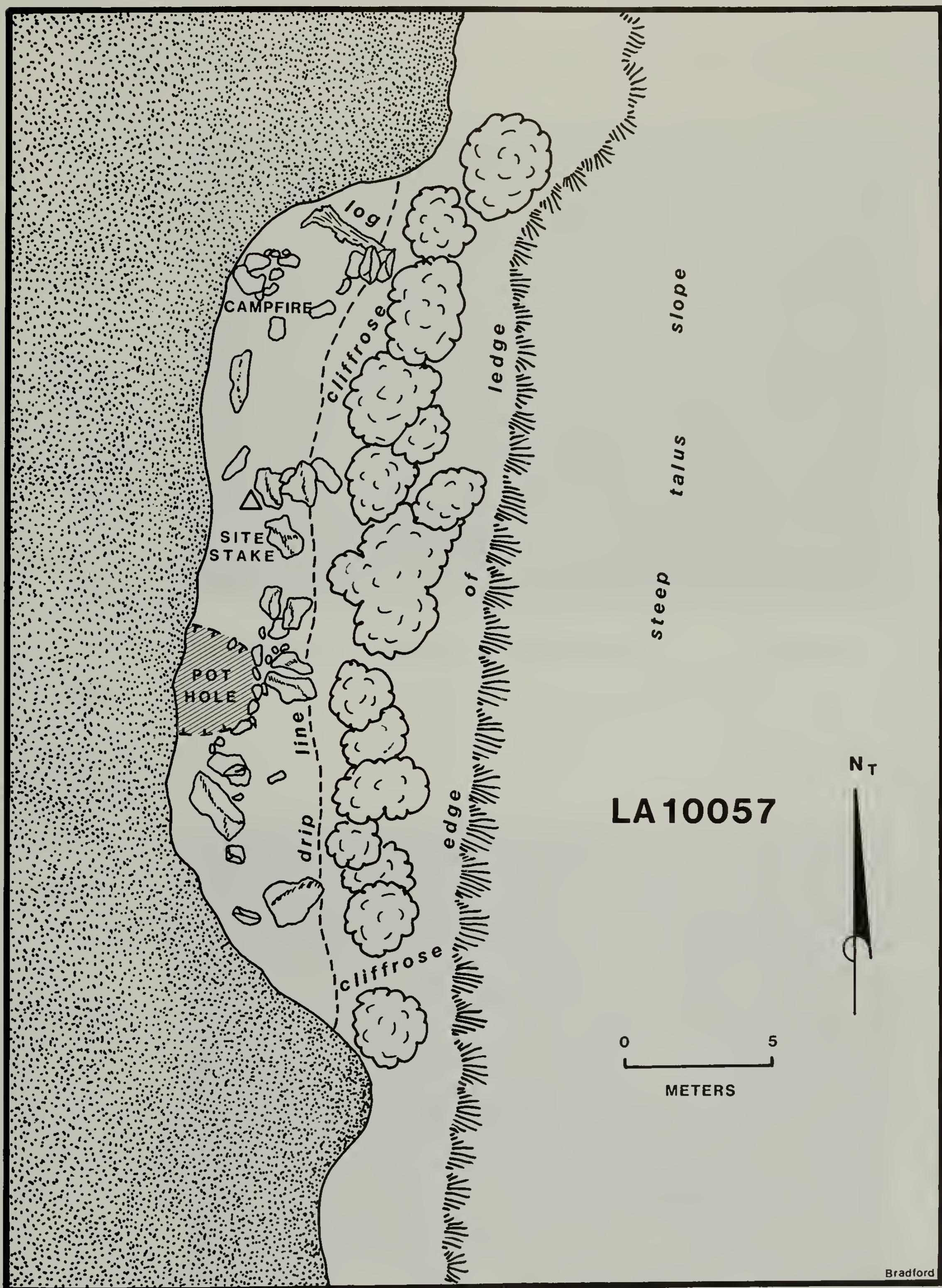


FIGURE 41: Site Map of LA10057.

FIGURE 42: LA10057, View West of Shallow Rockshelter.

FIGURE 43: LA10057, Interior View of Rockshelter. Note Level Floor With Substantial Soil Deposit.

Comments: This is a large, deep rockshelter situated near the confluence of Cliff Dweller Canyon and an unnamed side canyon on the west canyon wall (Figure 44). There is very little surface indication at the site but a pothole near the center of the overhang exposed the corner of a masonry room or storage unit below grade (Figures 45 and 46). Green moss at the base of the back wall is indicative of a seep within the shelter and fresh ceiling spalls are suggestive that the shelter is still actively forming, perhaps burying much of the cultural deposits within the overhang. The site setting is riparian with a good stand of Douglas fir and other trees. Site use was most likely for storage and limited activity. Habitation may have occurred on a limited basis but the area is subject to occasional flooding.

LA10059

Site Type: Rockshelter
Site Size: 102 m^2 (0.02 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None

Elevation: 1816 m (5960 ft)
Date Range: A.D. 550-1150

Observations: Heavily damaged by natural erosion. Morris noted the alcove had been badly damaged by vandals with "charcoal fragments, grass and reeds, and corn stalks litter[ing] the back dirt". Much of this evidence is not as obvious today.

Comments: A low small shallow overhang with no obvious evidence of constructed features, although a number of rocks are scattered about the floor area (Figures 47 and 48). A portion of the ceiling is smoke blackened, as noted by Morris, and the overhang prehistorically probably served as a storage area and limited activity area.

LA10060

Site Type: Rockshelter
Site Size: 222 m^2 (0.05 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: 3-6

Elevation: 1816 m (5960 ft)
Date Range: A.D. 550-1150 & 1600-1900

Observations: A heavily disturbed site with perhaps as much as one-third of it pothunted. At least two or more slab-lined storage cists have been destroyed as well as cultural deposits within the floor fill.

Comments: LA10060 is a small but deep rockshelter situated in the upper end of a side drainage to Cliff Dweller Canyon (Figures 49-52). The amount of ceiling blackening and the number of artifacts and other cultural debris churned up by the pothunters is indicative that this shelter has a substantial amount of buried material within it. Its use, prehistorically, was for storage of foodstuffs as well as day-to-day activities and perhaps for habitation. Plainware sherds are abundant, as are corn cobs. Morris reported a bead collected from the talus slope and this survey recorded an arrow foreshaft with an obsidian point attached. Access to both Cliff Dweller Canyon and the surrounding high country is available from this site.

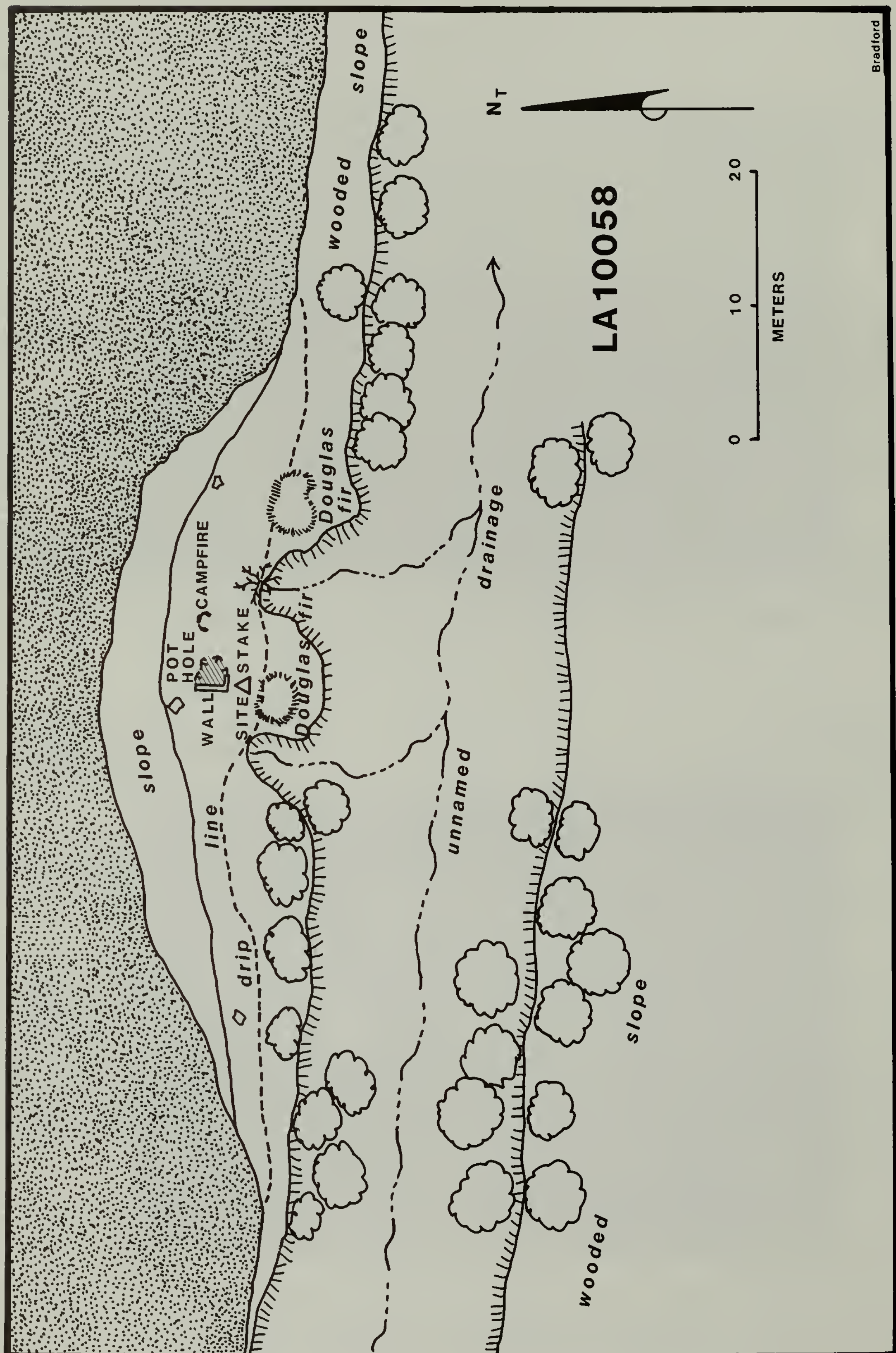


FIGURE 44: Site Map of LA 10058.

FIGURE 45: LA10058, View West Into Large Rockshelter.

FIGURE 46: LA10058, Close-up of Vandalized Area Within Rockshelter.
Note Exposed Masonry Wall in Pit.

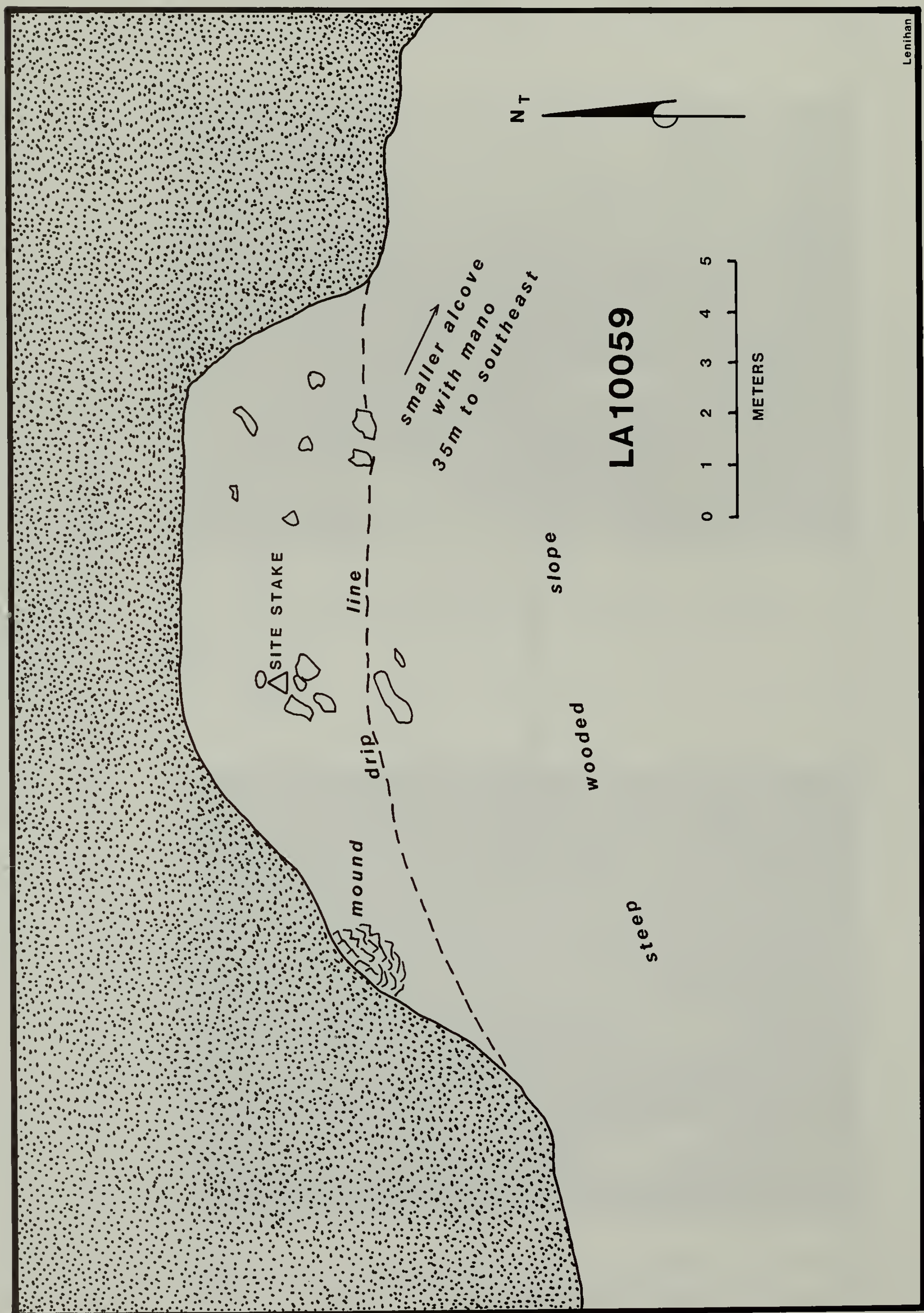


FIGURE 47: Site Map of LA 10059.

FIGURE 48: LA10059, View West Along Rockshelter Interior.

FIGURE 49: LA10060, View West Along Site Axis. Note Depth of Overhang.

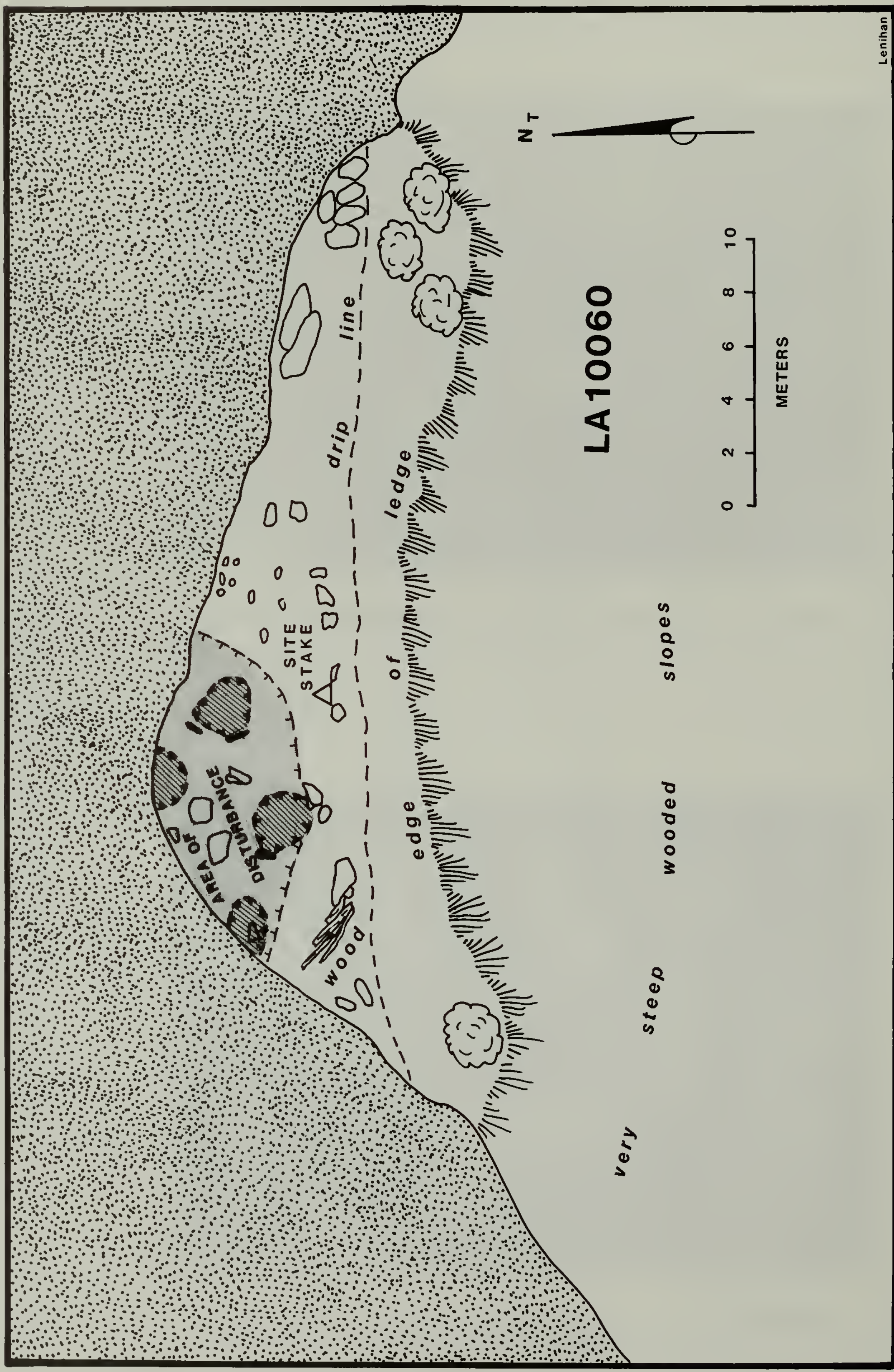


FIGURE 50: Site Map of LA 10060.

FIGURE 51: LA10060, View of Interior of Rockshelter Showing Vandalized Features. Compare With Figure 52.

FIGURE 52: LA10060, Close-up of Vandalized Features in 1956. Photo by Gordon Vivian.

LA10061

Site Type: Rockshelter
Elevation: 1823 m (5980 ft)
Site Size: 130 m² (0.03 ac)
Date Range: A.D. 550-1150
Estimated Number of Surface Rooms: 1(?)
Estimated Number of Subsurface Structures: None
Observations: Mostly intact floor with natural erosion affecting the peripheral boundaries of the site.

Comments: This is a small shallow overhang with one possible remnant of a stacked rock wall about 1.5 m long and one course in width near the center of the overhang (Figure 53). No ceiling blackening or staining exists and only three sherds were found. Morris noted "charcoal, vegetal material, and sherds" in the western end of the overhang in 1968. The site represents the remains of a limited activity area typical of rock overhangs within the monument.

LA10062

Site Type: Rockshelter
Elevation: 1828 m (5997 ft)
Site Size: 300 m² (0.07 ac)
Date Range: Unknown
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: Unknown
Observations: The east portion is highly damaged from erosion due to a pour-off or waterfall. The western portion of the overhang is full of gravelly soil and is somewhat eroded.

Comments: LA10062 is a U-shaped overhang at the head of a pour-off into "Pictograph Canyon," a side drainage to Cliff Dweller Canyon. This overhang is low and shallow (1.5x4.5x1.2 m) in interior space on the western side and an erosional gully on the eastern side (Figure 54). A steep slope into the canyon is in front of the overhang. Three larger spalls form a boundary just inside the drip line in the western portion of the overhang. Crew members noted no artifacts but blackening of part of the roof is evident (Morris stated it could be recent smoke blackening). Some charcoal was noted in the gravelly matrix that comprises the floor fill.

LA10063

Site Type: Rockshelter
Elevation: 1817 m (5960 ft)
Site Size: 10 m² (0.002 ac)
Date Range: Unknown
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: Situated within a small alluvial fan, much debris from the south canyon wall has been deposited through this small overhang.

Comments: This site is a very small rock overhang with roof blackening (Figure 55). Height within the overhang is only about 60 cm. Alluvium fills the floor area which is susceptible to flooding. Roof blackening may be chemical rather than from fires. No associated artifacts or features were noted during this survey and, although Morris states "No artifacts are found", three sherds identified as Apachean are in his collection (Box 26). Morris stated that the alluvial fill may cover any cultural deposits. Had Morris not already assigned a site number to this overhang, it probably would not have been recorded as a site.

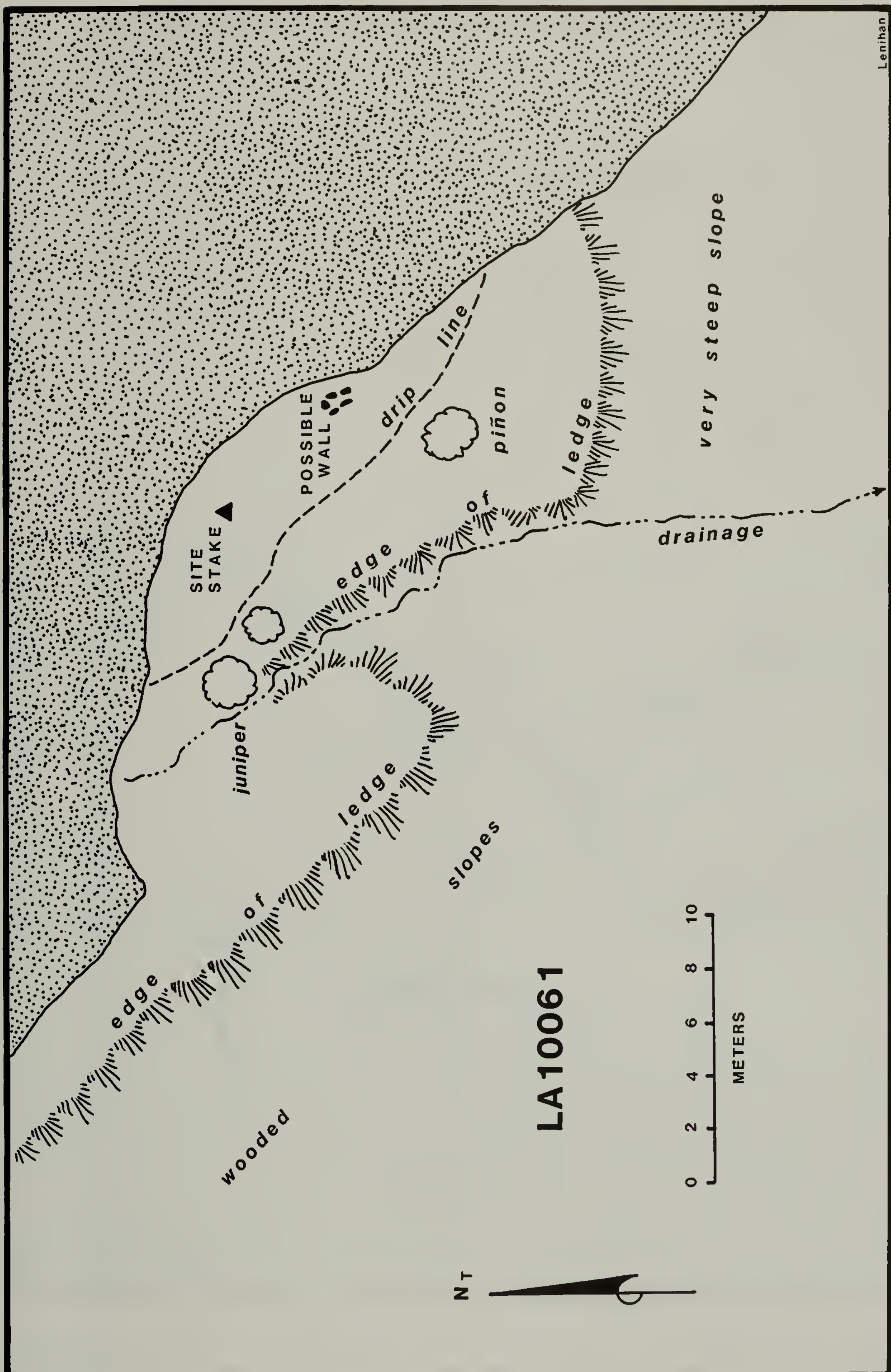


FIGURE 53: Site Map of LA 10061.

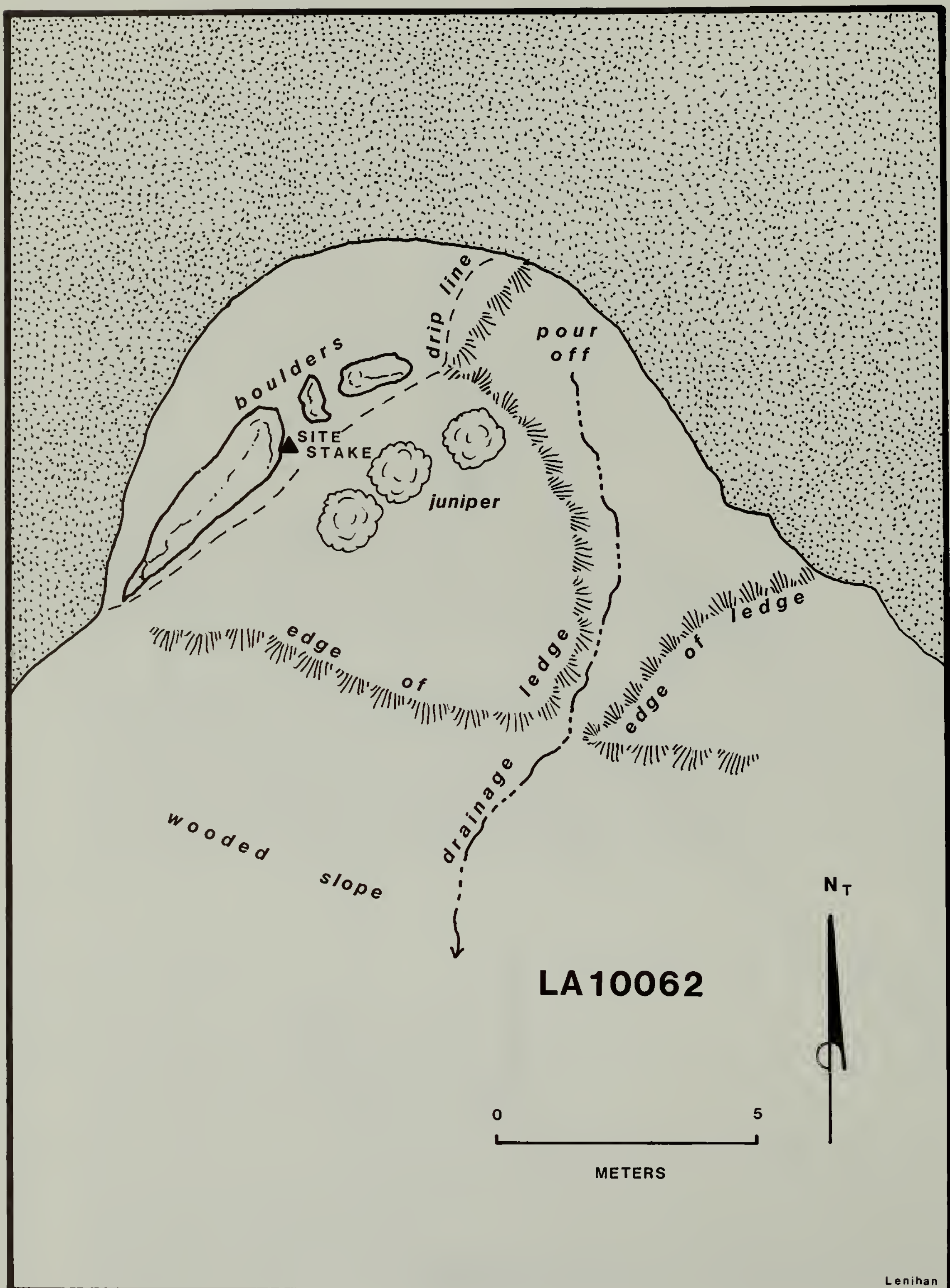


FIGURE 54: Site Map of LA10062.

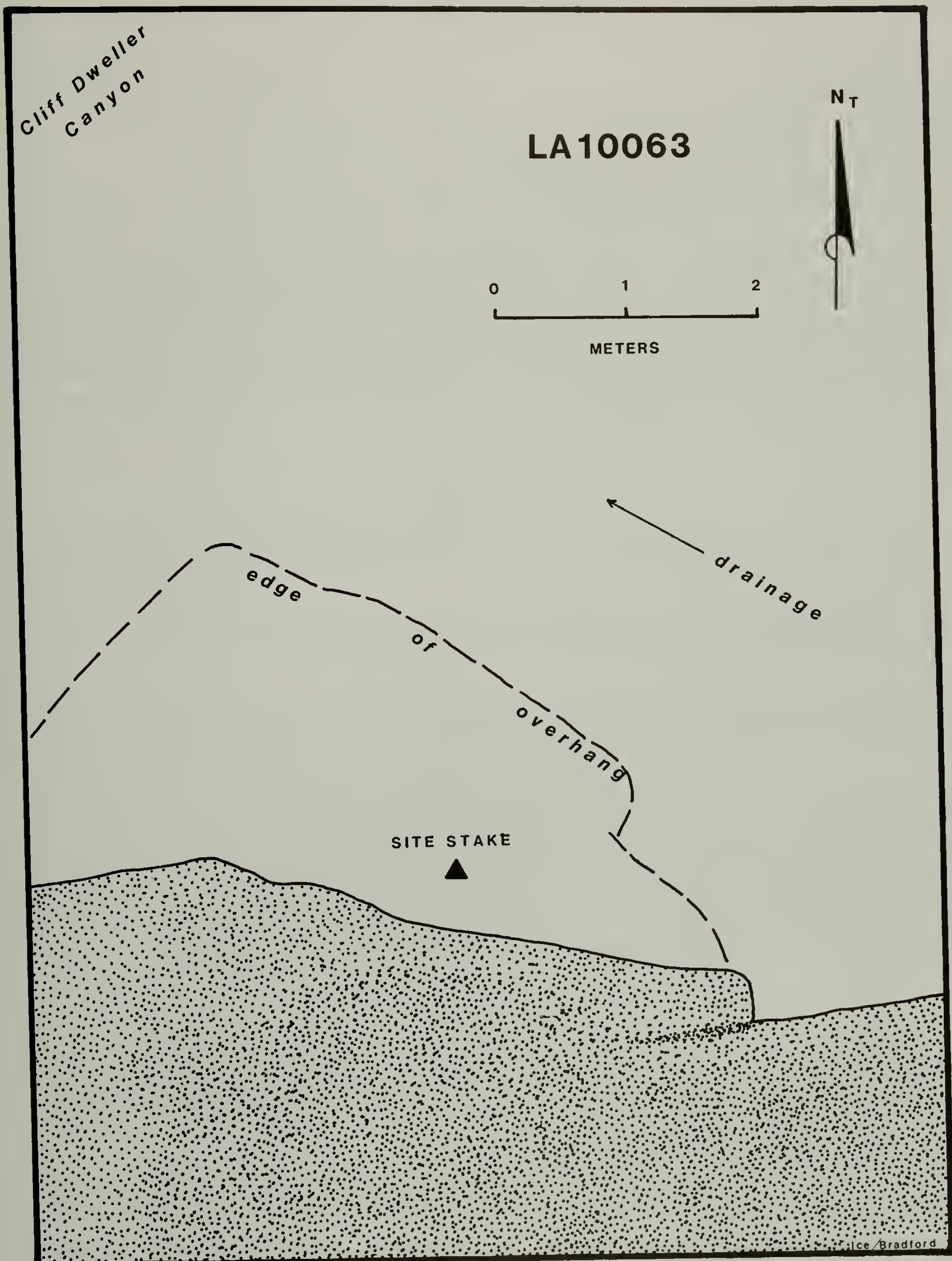


FIGURE 55: Site Map of LA10063.

LA10064

Site Type: Rockshelter
Elevation: 1817 m (5960 ft)
Site Size: 1394 m² (0.3 ac)
Date Range: 1600-1900
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: Natural erosion has had a limited effect on the site while natural deposition (alluvium and colluvium) is more apparent.

Comments: LA10064 is a long, narrow low rockshelter at the base of the south canyon wall (Figures 56 and 57). An upper ledge, about 4.5 m above the lower shelter, evidences some ceiling blackening but this does not fit the description given by Morris as he described the lower shelter as having "smoke blackening...in patches at the front of the roof of the shelter in an area about 4' x 30'". No other evidence of occupation is apparent in either portion of the site. Crew members found no artifacts during the later survey and Morris states that "no other sign of occupation is noted".

LA10065

Site Type: Rockshelter
Elevation: 1768 m (5800 ft)
Site Size: 32 m² (0.008 ac)
Date Range: A.D. 550-1150 (est.) & 600-1900
Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: Exposed bedrock covers much of the site area and very little soil occurs at the base of the cliff in which the overhang occurs.

Comments: This site is a small, narrow and very exposed alcove at the base of a high cliff on the south wall of Cliff Dweller Canyon (Figures 58 and 59). This site has very limited space in which to conduct activities and very little soil occurs within the overhang. Artifacts are lightly scattered downslope, although one corn cob and some scattered charcoal do occur in the main part of the alcove. Although not noted during this survey, Morris made note of plates of ponderosa bark and nodules of adobe with impressions of sticks about 2 cm (3/4 in) diameter. Gila Cliff Dwellings are visible up canyon to the west. The site appears to be a limited activity locus with a very good view down into the mouth of Cliff Dweller Canyon and its confluence with the West Fork. A single cairn of stacked rock may be prehistoric but more likely is a temporary marker or reference for the eastern boundary of the monument.

LA10066

Site Type: Rockshelter
Elevation: 1792 m (5880 ft)
Site Size: 104 m² (0.03 ac)
Date Range: A.D. 1100-1150
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: A major pour-off occurs in the middle of this overhang and, as a result, much of the interior of the shelter has eroded away. Only a small ledge of floor fill remains in the southern portion of the site.

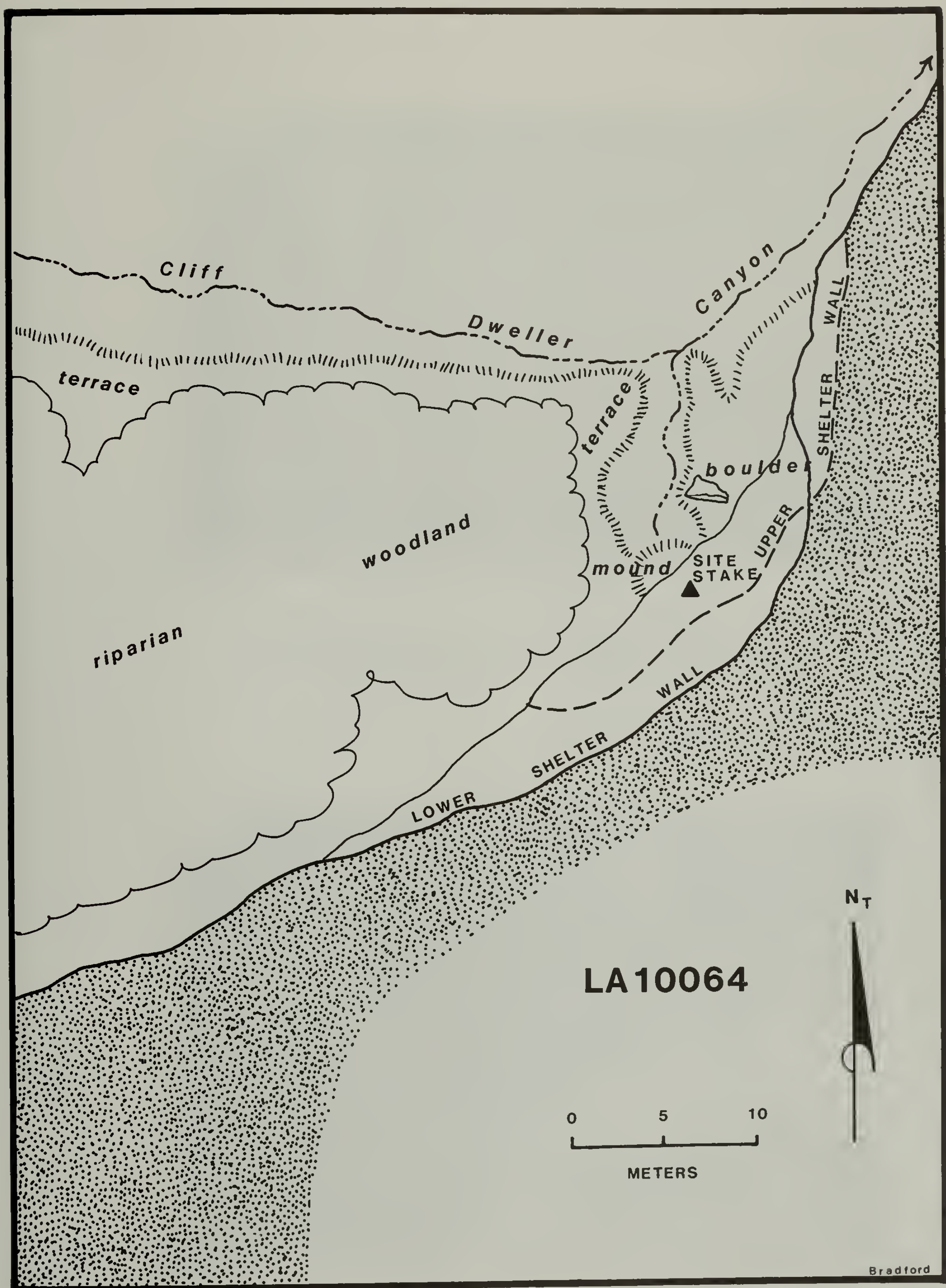


FIGURE 56: Site Map of LA10064.

FIGURE 57: LA10064, View of Low Rockshelter in Cliff Dweller Canyon. Upper Ledge Occurs Directly Above Author.

FIGURE 58: LA10065, View of Very Shallow Rockshelter Above Mouth of Cliff Dweller Canyon.

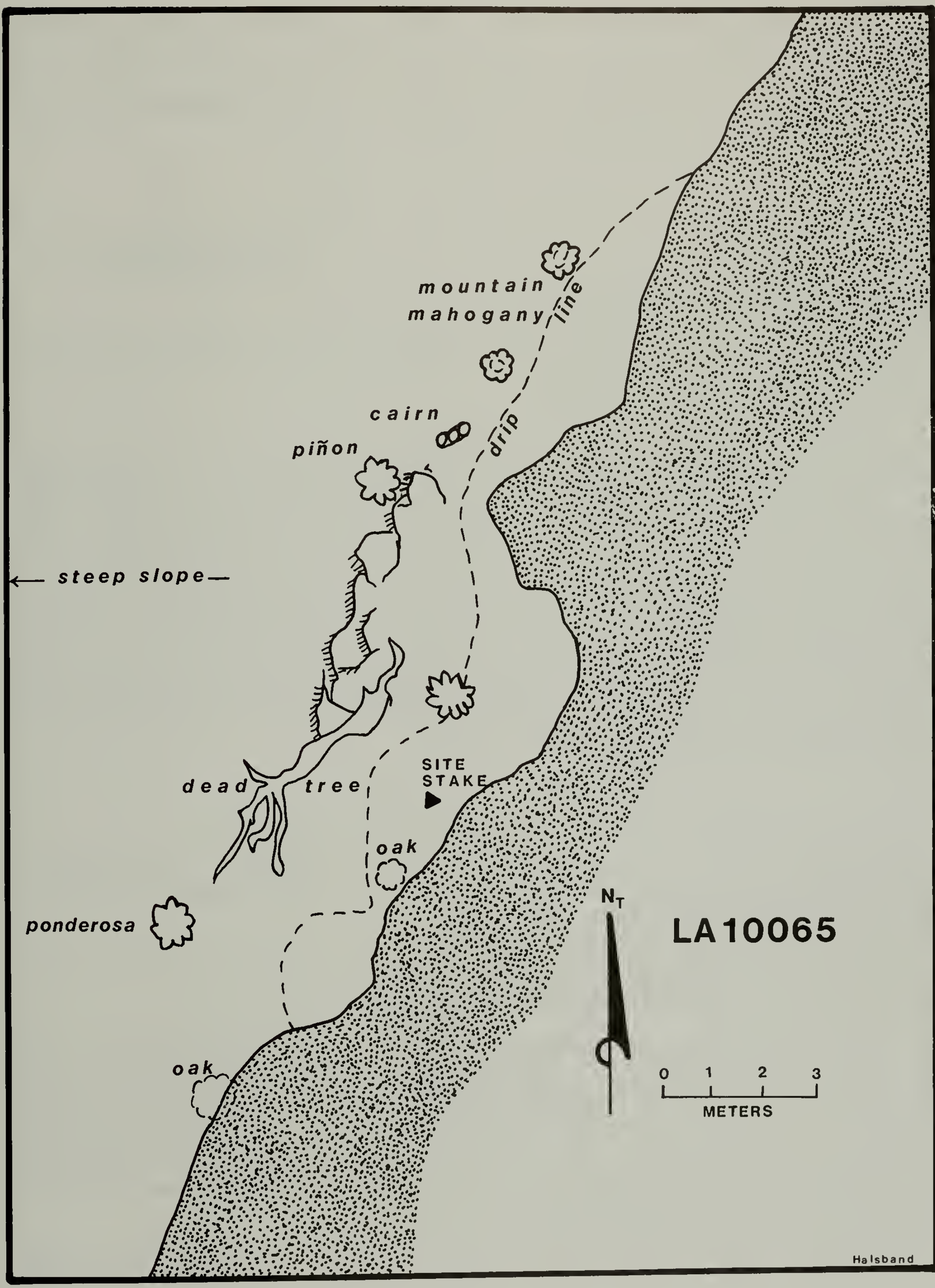


FIGURE 59: Site Map of LA10065.

Comments: This is a long, very narrow and highly exposed overhang with most of the floor removed by erosion (Figures 60 and 61). Morris noted the presence of "smoke blackening on the roof" and no artifacts. This survey located a single two-hand mano and a single Mimbres whiteware jar sherd. Ponderosa bark, noted by Morris, still remains on the gravelly ledge of floor fill. This appears to be a limited activity locus used for food procurement and processing.

LA10067

Site Type: Rockshelter
Elevation: 1768 m (5800 ft)
Site Size: 375 m^2 (0.09 ac)
Date Range: Unknown
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: Natural erosion has occurred to some degree within this rockshelter and flooding probably has happened at least a few times. A visitor rest area along the interpretive trail is in the downstream end of this rockshelter.

Comments: LA10067 is a large, deep and high rockshelter at the base of the south canyon wall within Cliff Dweller Canyon below Gila Cliff Dwellings (Figures 62-64). This large shelter has numerous large boulders within the overhang that have fallen from the ceiling. These boulders take up much of the available space within the shelter but also provide access to the roof overhang on which someone painted a number of red, and at least one white, rock art elements. Additionally, a very large boulder in the upstream end of the shelter has at least 16 grinding facets on the top of the rock surface where prehistoric activity occurred. Along with the grinding facets are eight small "cups" or concavities in the boulder surface. Morris noted 11 "cups", seven of which are within grinding facets. Rock art elements include one white paint streak, two red ovals and a single red line, which Morris thought may have been an anthropomorph figure. No artifacts were noted on the shelter surface. This locale represents at least an activity area for grinding of food or tools.

LA10068

Site Type: Rockshelter
Elevation: 1786 m (5860 ft)
Site Size: 252 m^2 (0.06 ac)
Date Range: Unknown
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: Because of the exposed and shallow nature of this overhang, a moderate degree of natural erosional forces damaged it. No vandalism is apparent.

Comments: This is a long, narrow very shallow overhang at the base of the cliff face on the northern side of "Cliff Dweller Ridge" (Figures 65 and 66). This small activity area evidences use by the presence of two bedrock mortars, one or two rock art elements, and a very light scattering of stone flakes. The remnants of a hand-and-toe-hold trail occur at the eastern end of the shelter and lead up to a small ledge about 3 m above the shelter floor. The protected area within the drip line is only about 8 m^2. The site represents an activity area where food processing and stone tool maintenance took place.

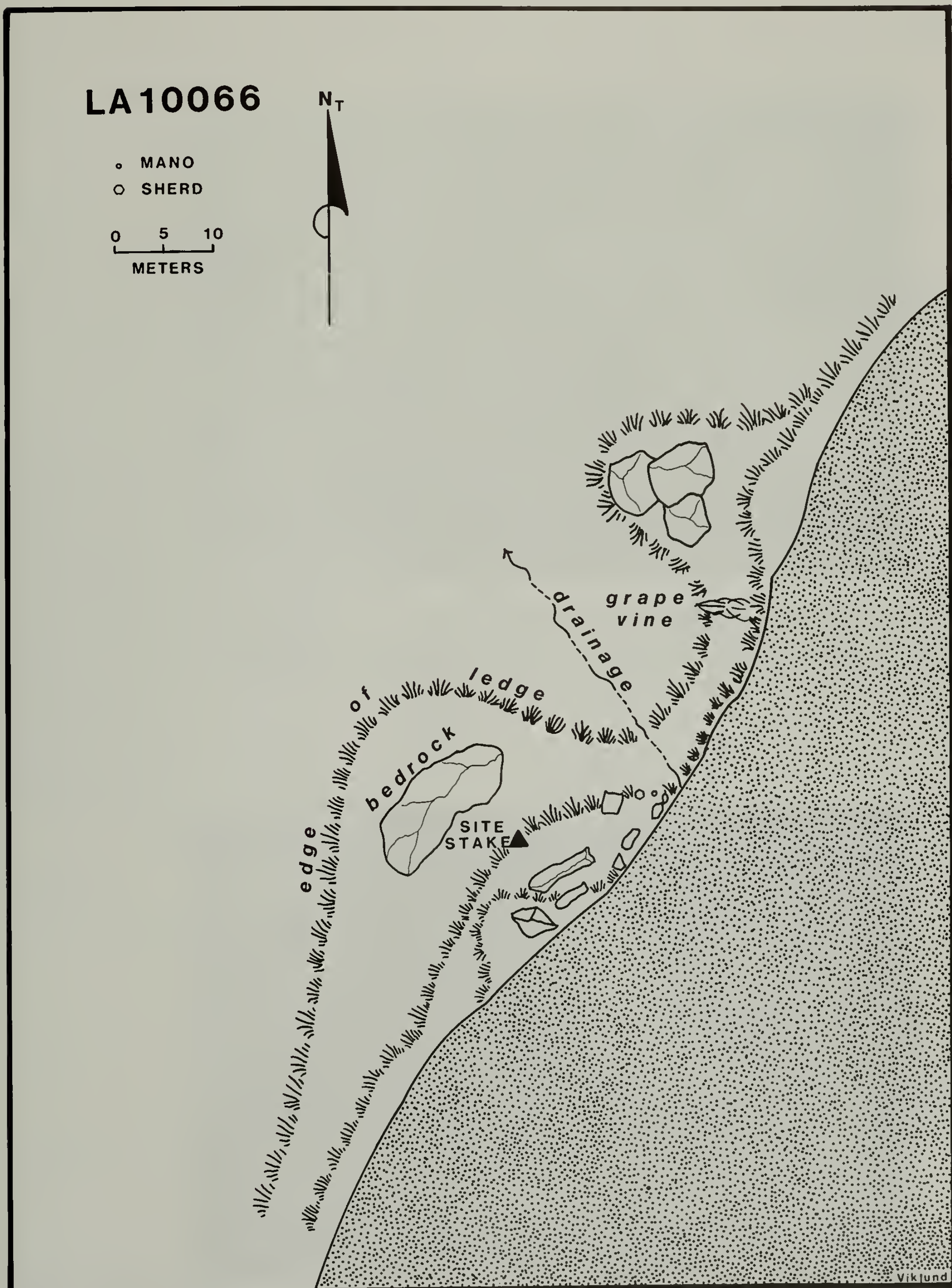


FIGURE 60: Site Map of LA10066.

FIGURE 61: LA10066, A. Halsband and J. Hurley Map Shallow Rockshelter. Note Remnant of Floor Fill to Right of Mappers.

FIGURE 62: LA10067, View From Visitor Trail of Boulder-Strewn Rockshelter

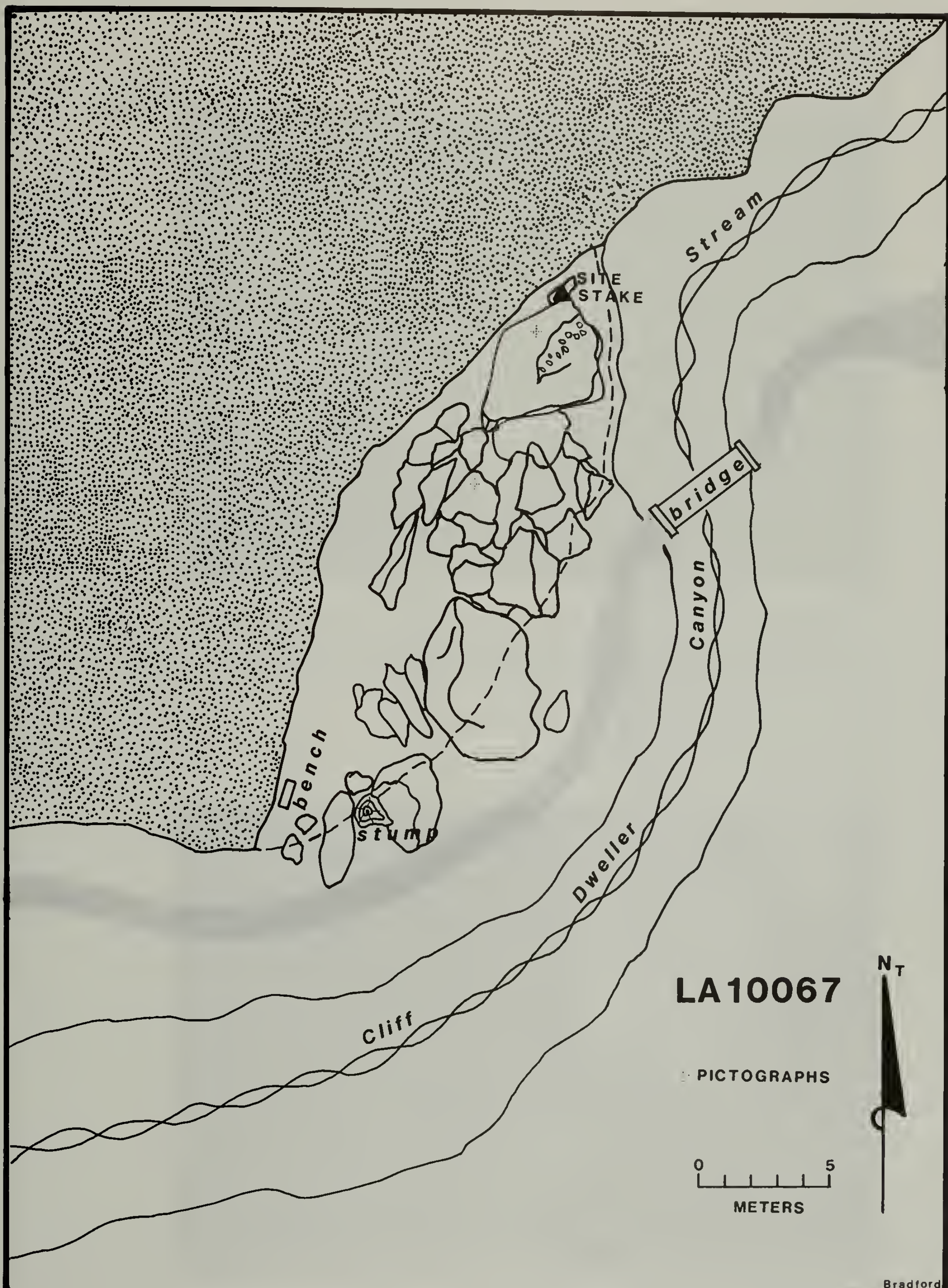


FIGURE 63: Site Map of LA10067.

FIGURE 64: LA10067, Interior View of Large Boulder With Grinding Facets. Note Cliff Dweller Creek and Visitor Trail to Right.

FIGURE 65: LA10068, View East of Site. L. Heacock and the Author Map Site.

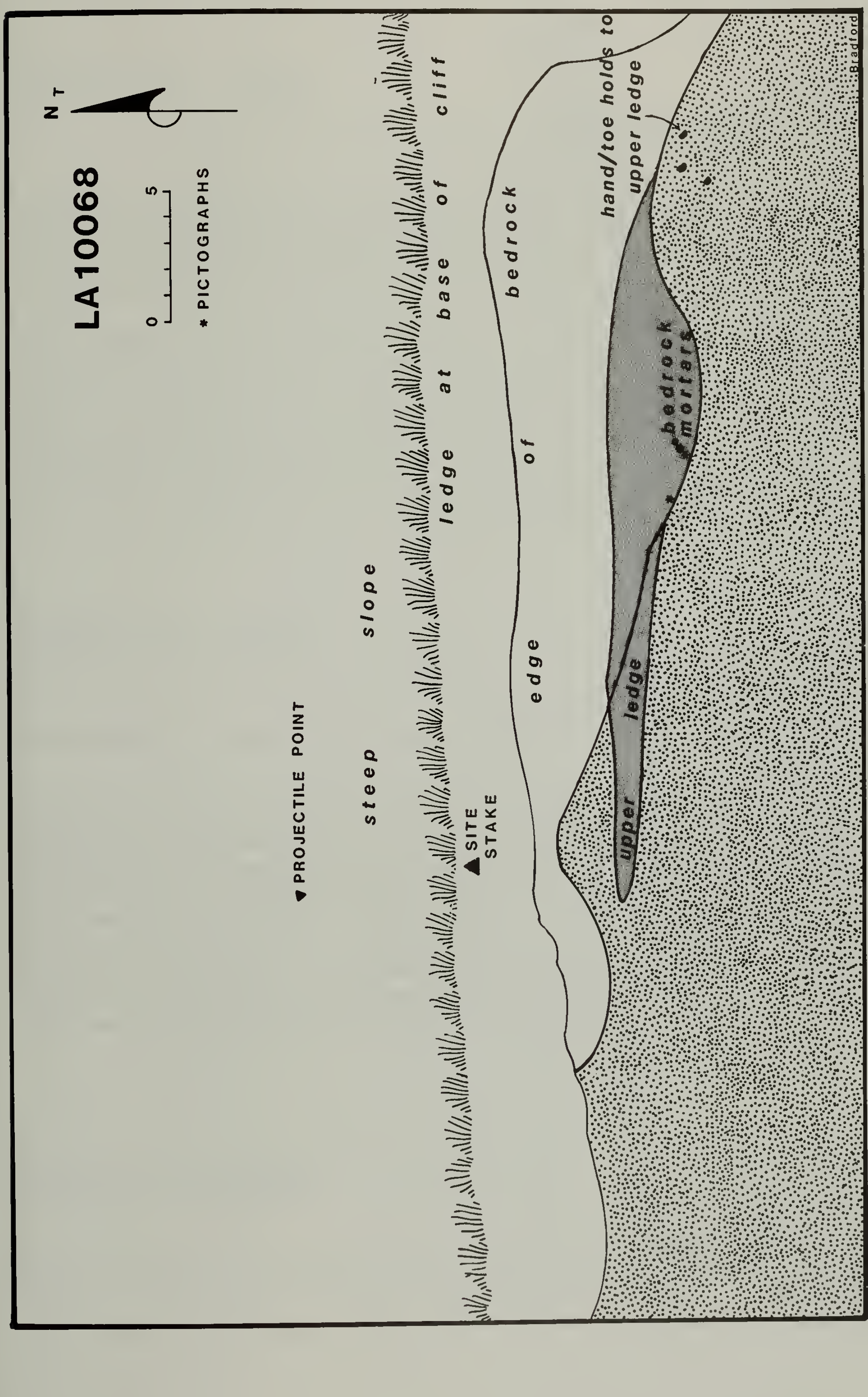


FIGURE 66: Site Map of LA 10068.

LA10069

Site Type: Rockshelter
Site Size: 165 m² (0.04 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Elevation: 1786 m (5860 ft)
Date Range: A.D. 1150-1200

Observations: Erosion has not damaged the site very much. However, four or five potholes occur across the floor of the shelter, exposing gray soil and, as noted by Morris, "hunks of red and gray adobe, some grass, and corn cobs". The back ceiling is smoke blackened in a few places and artifacts, although light in number, lay scattered across the front slope of the site.

Comments: This site is just a few meters west of LA10068 along the base of the same cliff face overlooking the West Fork. This shelter, however, is more substantial in amount of protected area and soil depth within the shelter (Figures 67 and 68). A few rocks from the ceiling lay scattered over the western portion of the site. Although soil depth probably is not deep enough for subsurface structures of any size, some storage cists may exist. This is supported by Morris' notation on adobe hunks that may have been used in construction of such features. If present, the cists remain buried or have been destroyed by the vandalism. The site served as a limited activity area and possible storage area.

LA10075

Site Type: Pueblo
Site Size: 2420 m² (0.6 ac)
Estimated Number of Surface Rooms: 2-4
Estimated Number of Subsurface Structures: None
Elevation: 1856 m (6090 ft)
Date Range: A.D. 1150-1200

Observations: The site is in very good condition except for some damage from trees growing inside the roomblock.

Comments: LA10075 is a small square roomblock of two to four rooms constructed of undressed blocks and slabs of Gila Conglomerate (Figures 69 and 70). The site appears to be the remains of a seasonally used pueblo in the higher elevations of the southeastern quadrant of the main monument. A light, but extensive artifact scatter surrounds the roomblock and appears to be concentrated just to the southeast of the structure. An L-shaped wall alignment 10 m southwest of the roomblock may be indicative of a plaza area or, more probably, a check dam. The site is primarily on USFS land but the artifact scatter extends westward into the main unit of the monument. This site is one of several small roomblocks in this area of the monument and appears to be another small Mimbres phase pueblo occupying the higher ridges away from the primary drainages.

LA10081

Site Type: Pueblo
Site Size: 672 m² (0.2 ac)
Estimated Number of Surface Rooms: 1
Estimated Number of Subsurface Structures: None
Elevation: 1877 m (6160 ft)
Date Range: A.D. 750-1200

Observations: Natural erosion of the narrow ridge crest on which the room sits is the only damage to the site.

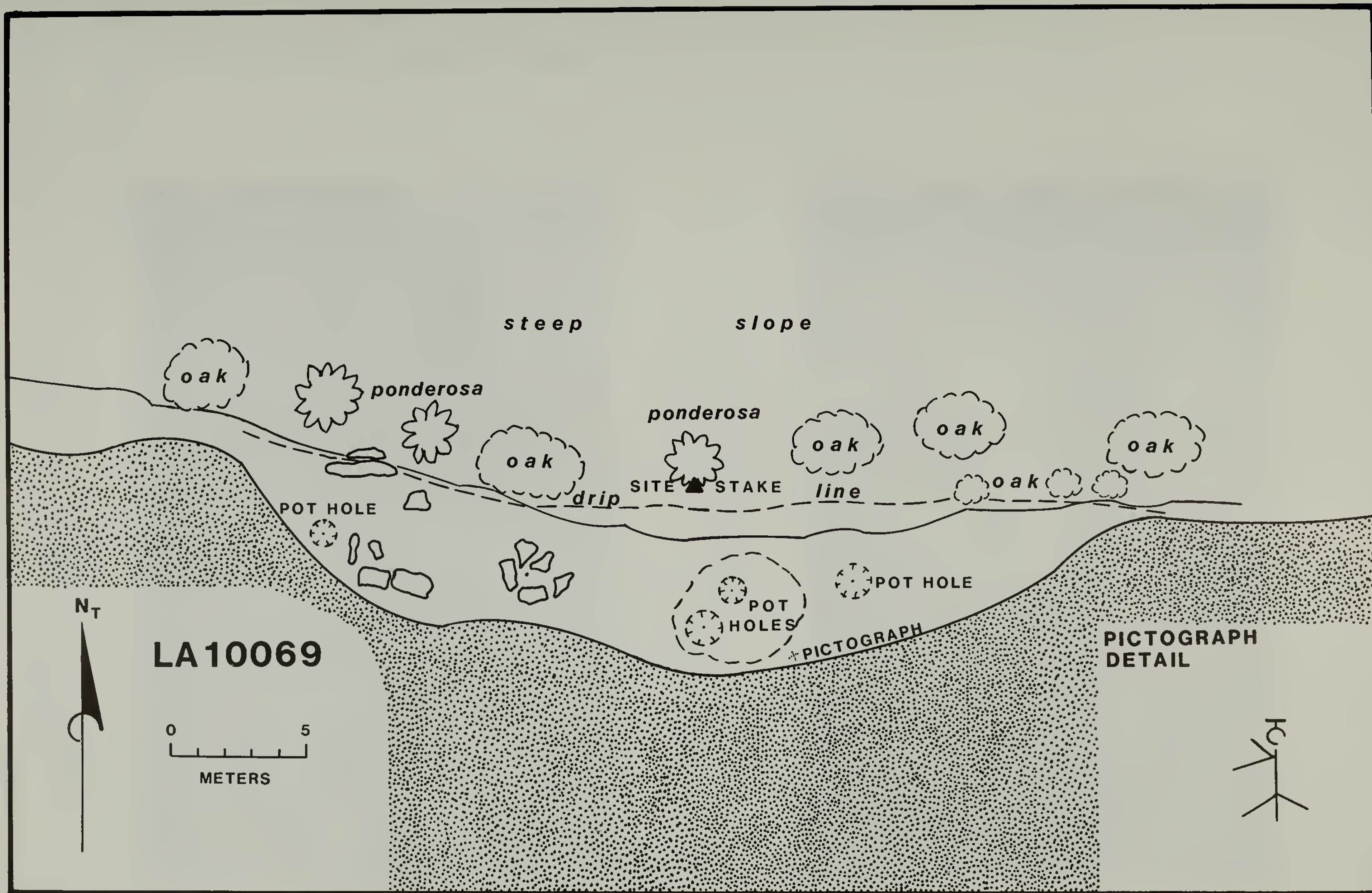


FIGURE 67: Site Map of LA 10069.

FIGURE 68: LA10069, View East of Site Area.

FIGURE 69: LA10075, View Northwest of Site Area. Roomblock Occurs Within Tree Cluster in Middle of Photograph. Trash Area in Foreground.

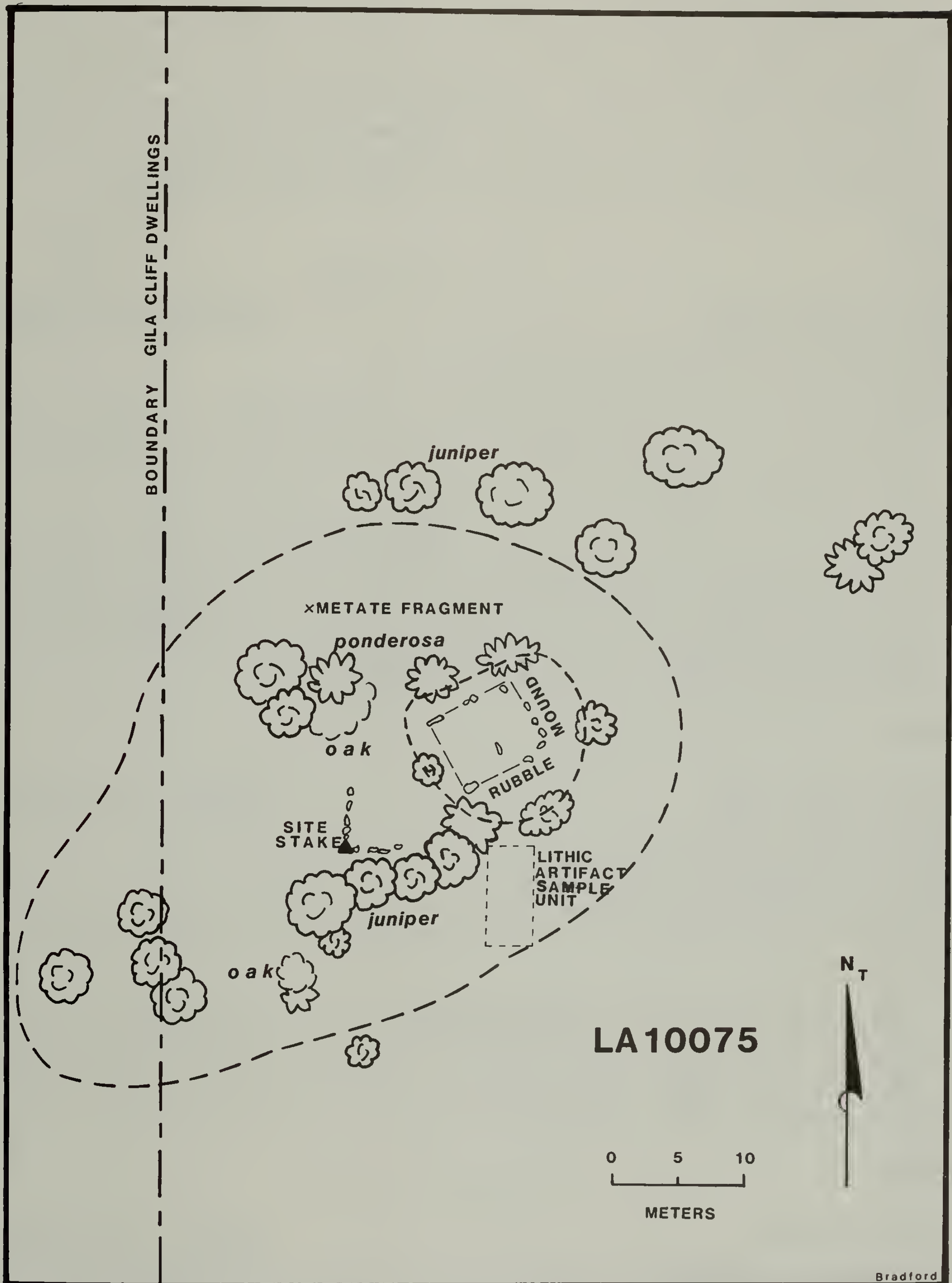


FIGURE 70: Site Map of LA10075.

Comments: This site is a single room outline of unworked Gila Conglomerate located near the crest of a narrow ridge in the higher elevations along the western boundary of the main monument unit (Figures 71 and 72). The room averages about 16 m² of interior floor space. The walls are currently about 30 cm in height and wall fall lays in all directions from the room outline. A light scatter of stone flakes and sherds surrounds the structure and a large trough metate is 5 m west of the room. It appears to be a single room fieldhouse for seasonal activities, including food processing and stone tool manufacture/maintenance.

LA10082

Site Type: Artifact scatter — Elevation: 1841 m (6040 ft)
Site Size: 3600 m² (0.9 ac) — Date Range: A.D. 750-1200
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: Natural erosion has had some affect on the site surface as of 1989. The May 1991 forest fire burned up to the northern site boundary but not over the site area. Fire suppression crews, however, constructed a fire line through the site area along the crest of the ridge. Damage to the site surface was moderate.

Comments: The site is a surface scatter of lithic material located on the crest of a spur ridge in the western portion of the main monument unit (Figure 73). Crew members noted two areas of concentration within a larger scatter of stone artifacts. Morris (1968) noted and collected only two very small sherds of Alma Plain. Morris also noted two one-hand manos on the site during his earlier recording. The site apparently served as a stone tool manufacturing locus with perhaps some food processing activities as well.

LA10083

Site Type: Artifact scatter — Elevation: 1786 m (5860 ft)
Site Size: 4000 m² (1.0 ac) — Date Range: A.D. 550-1250
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: Limited natural erosion of surface area as of 1989. The May 1991 forest fire burned up to the northern and western boundaries of the site but not over the site area.

Comments: LA10083 is a moderate scatter of artifacts primarily consisting of stone tool debris, a few sherds and several mano fragments (Figure 74). The old telephone line to White Creek (strung in 1915) lays across the southern portion of the site. A large wire staple and a 6 oz. metal can with the top cut out also occur on-site. Obsidian is abundant in the lithic debitage. This site could be related to LA10045 that is on the bench to the north of this site. However, direct association cannot be confirmed.

LA10085

Site Type: Rockshelter — Elevation: 1813 m (5950 ft)
Site Size: 110 m² (0.03 ac) — Date Range: Unknown
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Rooms: None
Observations: None within the overhang. Erosion of slope in front of site.

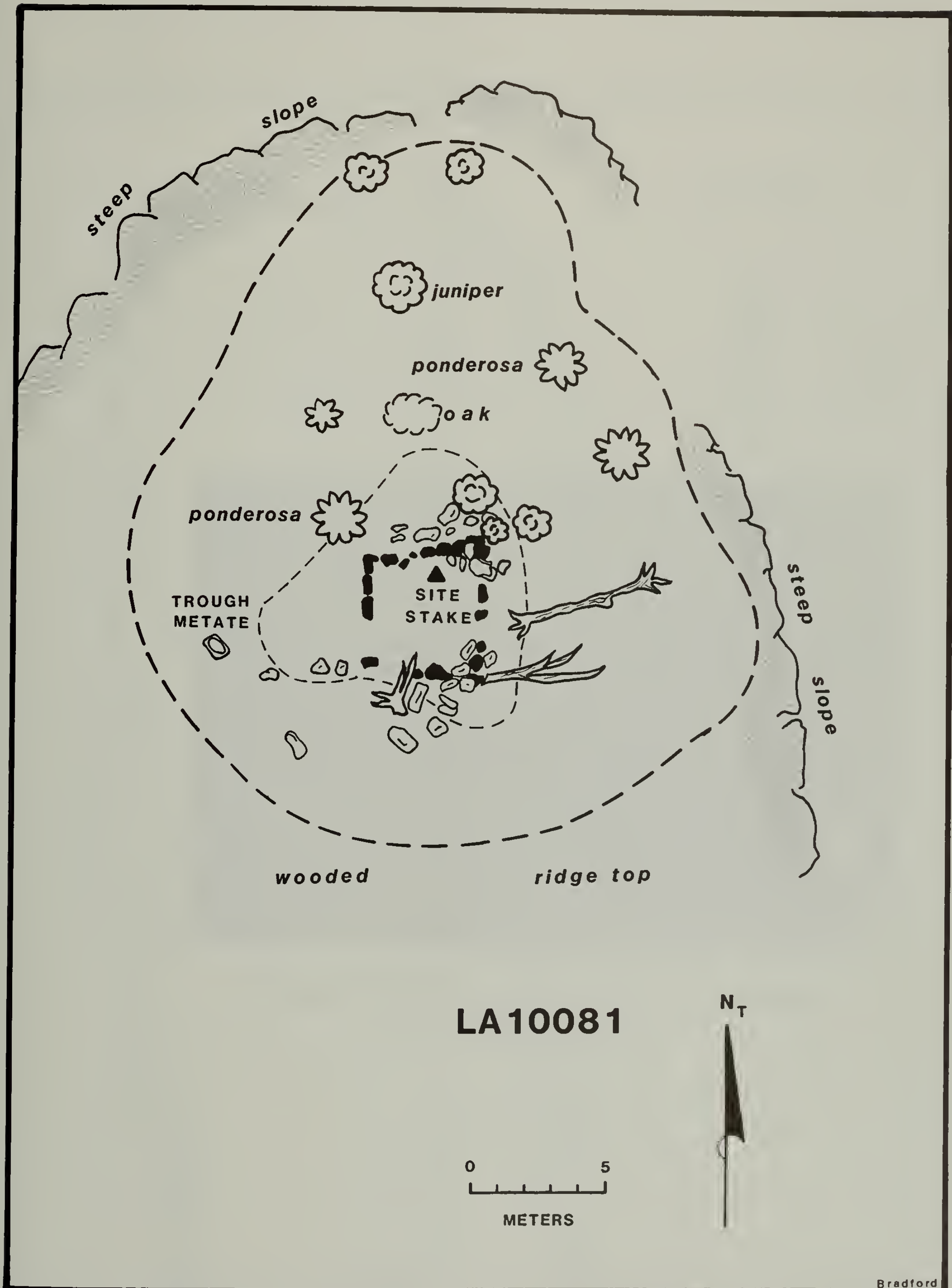


FIGURE 71: Site Map of LA10081.

FIGURE 72: LA10081, Close-up of Trough Metate and Mano Fragment.

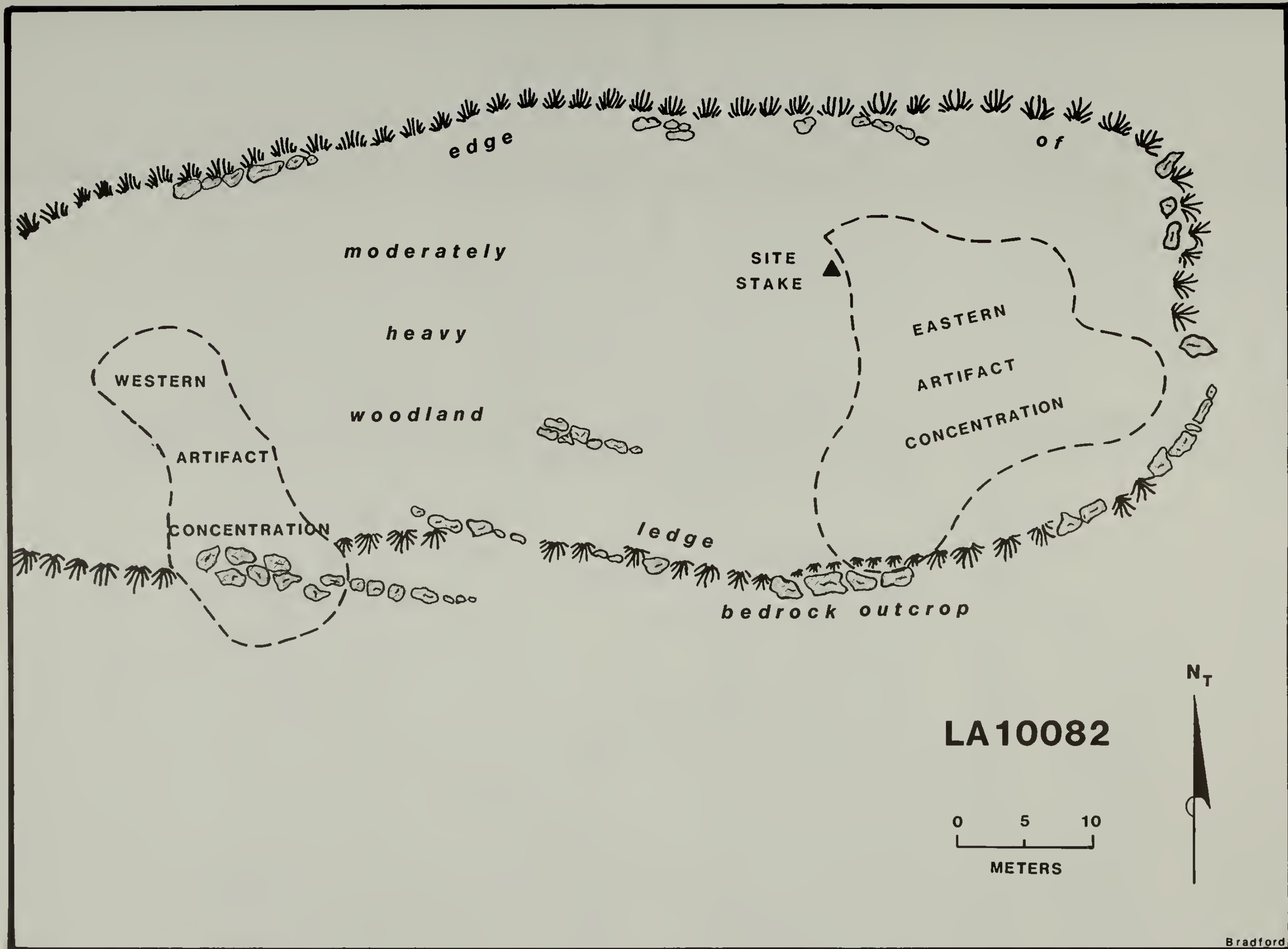


FIGURE 73: Site Map of LA 10082.

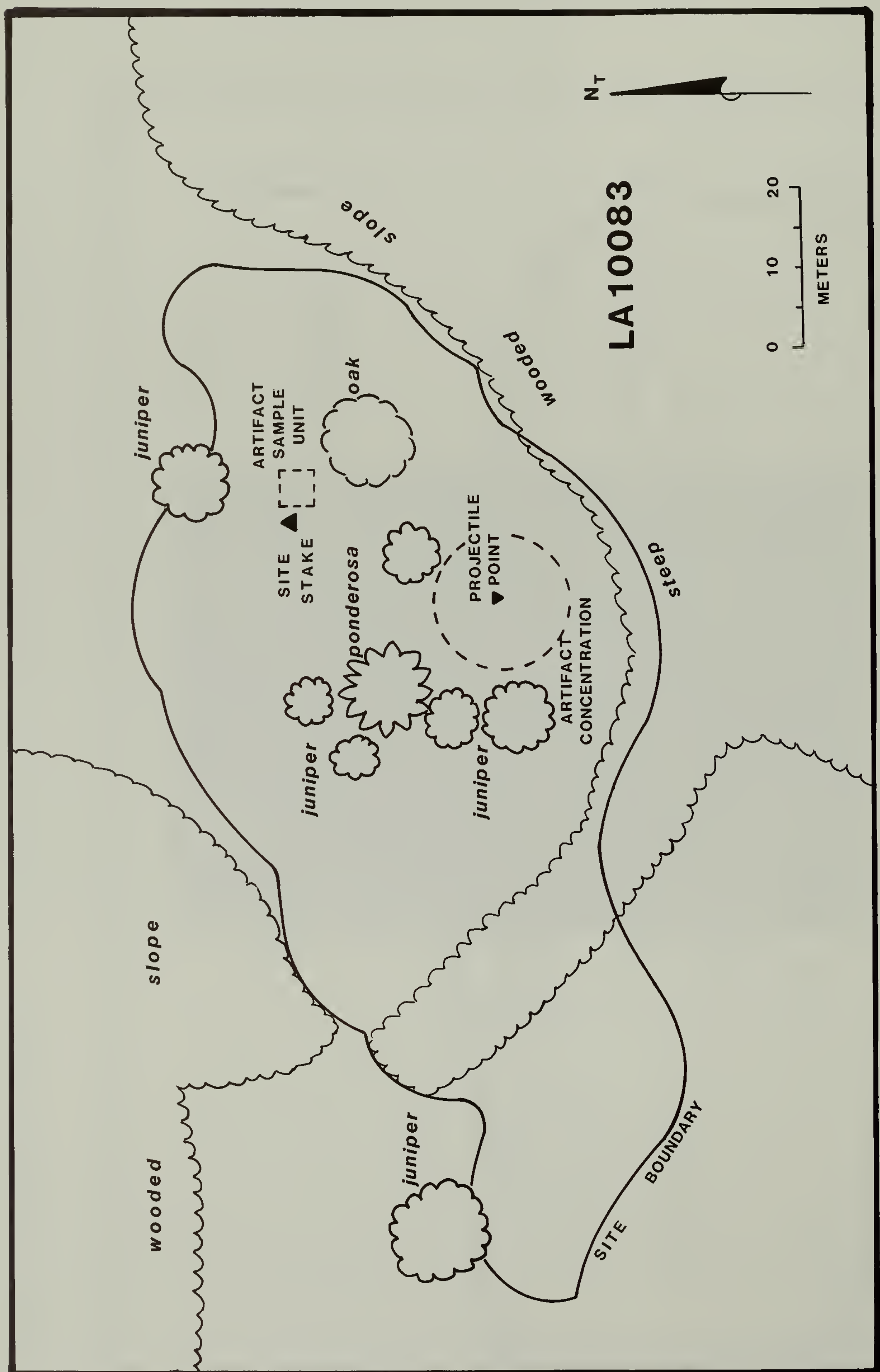


FIGURE 74: Site Map of LA 10083.

Comments: Crew members found no artifacts in association with this overhang (Figure 75). Some smoke blackening may occur on the roof but this is problematical. A light scattering of charcoal does occur in the gravelly soil of the shelter floor. Morris recorded the site based on the blackening and on a boulder downslope. The overhang may have been used prehistorically but definite evidence is lacking. The site was rerecorded since Morris assigned a number to it.

LA13658 Gila Cliff Dwellings

Site Type: Pueblo Elevation: 1804 m (5920 ft)
Site Size: 6750 m^2 (1.7 ac) Date Range: A.D. 1276-1325
Estimated Number of Surface Rooms: 42
Estimated Number of Subsurface Structures: None
Observations: Due to looting in the early years and professional excavation in the 1940s and 1960s, little fill remains within the rooms. Other damage includes some deterioration due to tourist visits.

Comments: The signal site of the monument (Figures 76-78), Gila Cliff Dwellings represent masonry cliff dwelling remains in five caves within Cliff Dweller Canyon, which were constructed in the last quarter of the thirteenth century and abandoned by the first quarter of the fourteenth century by Tularosa phase inhabitants from the north. Sites of this particular age are not common in the immediate area and thus these cliff dwellings are significant for that reason. The masonry remains are about 80 percent original material and remain in very good condition today. As a result of numerous questions regarding the blackened ceilings of these caves, Dr. Stephen Lambert conducted a study included in this report as Appendix 6.

LA54955 TJ Ruin

Site Type: Pueblo/Pithouse site Elevation: 1760 m (5775 ft)
Site Size: 60000 m^2 (14.8 ac) Date Range: A.D. 600-1400
Estimated Number of Surface Rooms: c. 200
Estimated Number of Subsurface structures: 7
Observations: Site damage includes limited pothunting activities, unauthorized surface collection and livestock grazing.

Comments: TJ Ruin is the largest known site in the immediate area of the Gila forks and the site with perhaps the longest occupation/reoccupation sequence (McKenna and Bradford 1989). This large open site contains five house mounds, three isolated surface structures, three large (great?) kivas, four smaller kivas or pitstructures, an enclosing wall, and a relatively heavy artifact scatter (Figures 79-81). The primary occupation period was the Mimbres phase (A.D. 1000-1200) but earlier Georgetown and Three Circle/Mangus phase occupations probably occurred. A reoccupation by Salado people in the early A.D. 1400s also is apparent. This is one of the very last known classic Mimbres sites left intact and is very significant for its research potential.

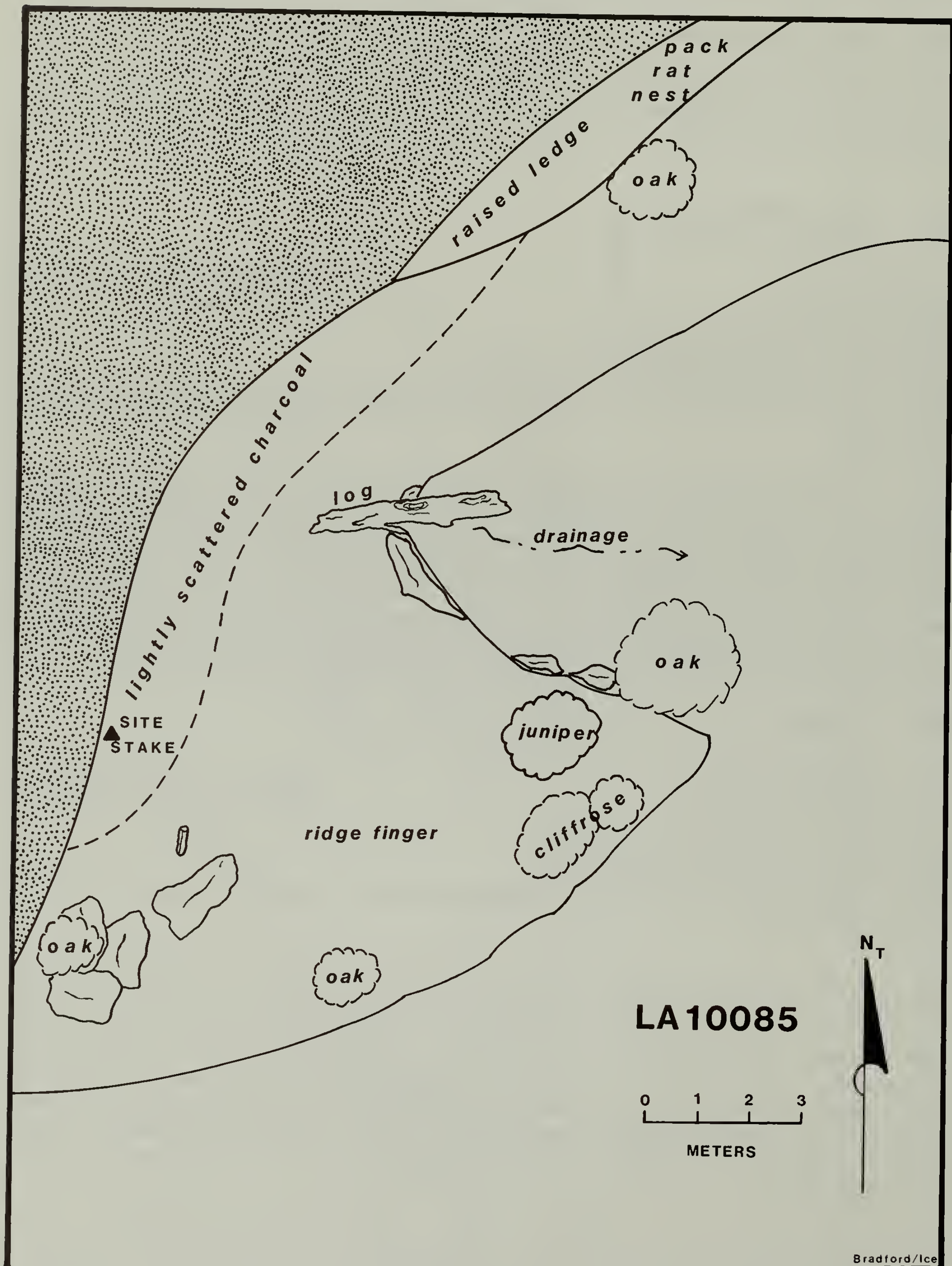


FIGURE 75: Site Map of LA10085.

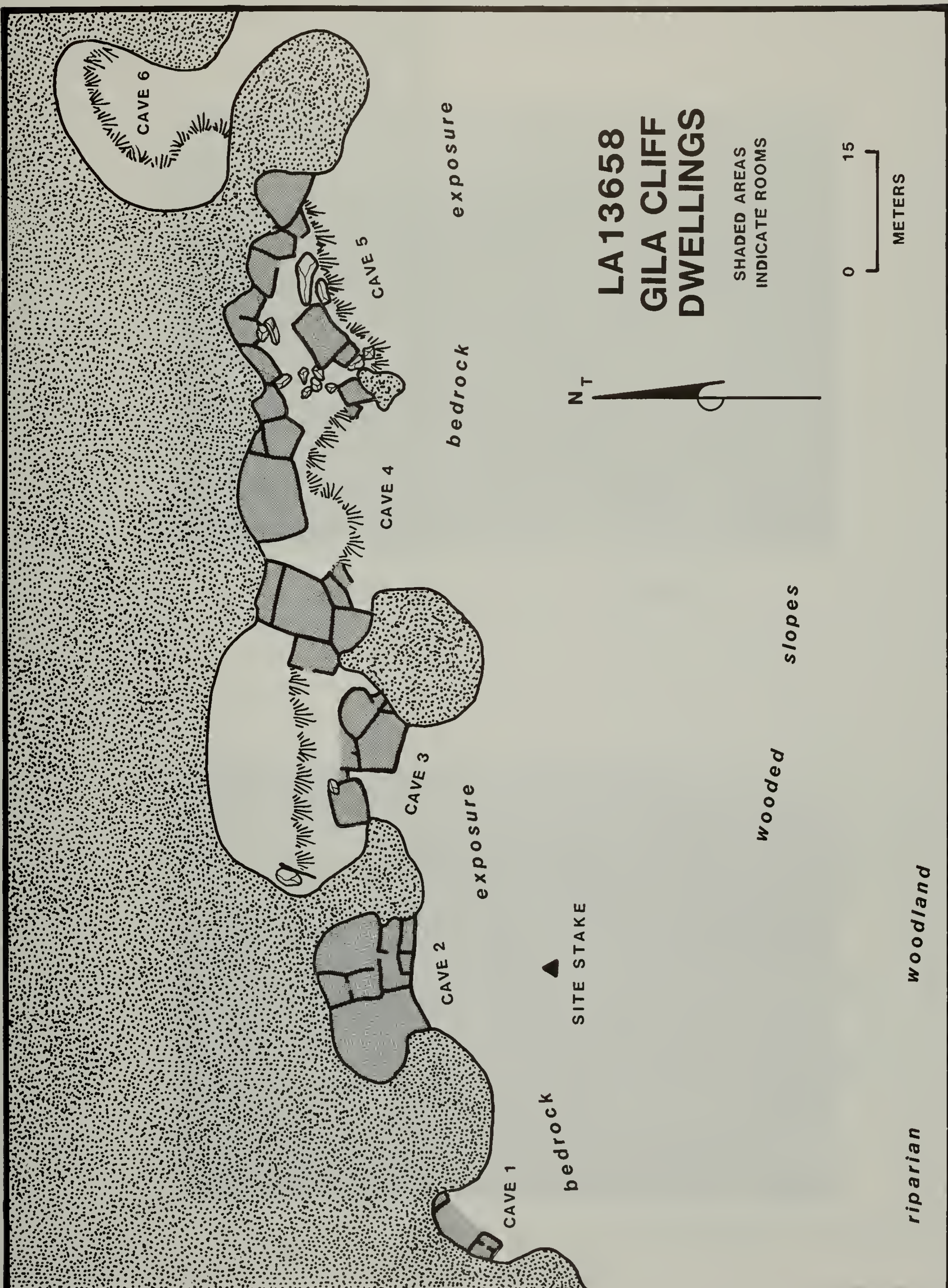


FIGURE 76: Site Map of Gila Cliff Dwellings - LA 13658.

FIGURE 77: View of Gila Cliff Dwellings.

FIGURE 78: View of Gila Cliff Dwellings, Caves 3-6.
West Fork in Background.

FIGURE 79: Site Map of TJ Ruin - LA54955.

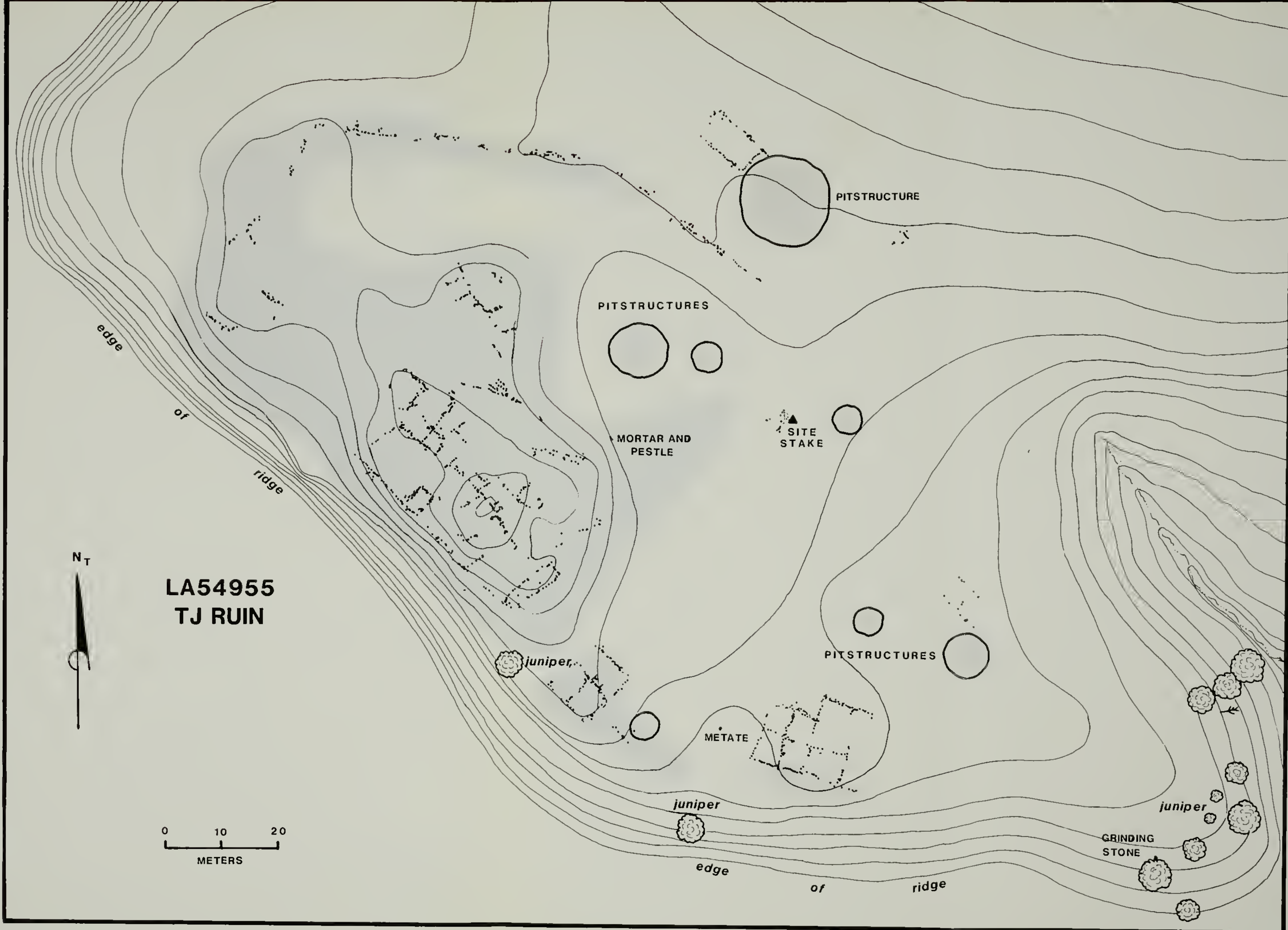


FIGURE 79: Site Map of TJ Ruin - LA54955.

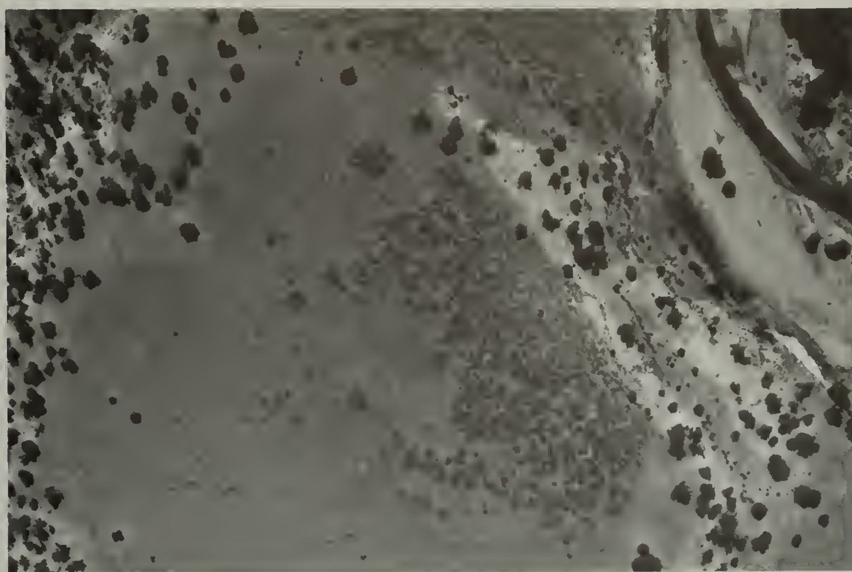


FIGURE 80: Aerial Photograph of TJ Ruin.

FIGURE 81: View Southwest of TJ Mesa with TJ Ruin in Background.

LA70318

Site Type: Artifact scatter
Elevation: 1795 m (5890 ft)
Site Size: 13050 m^2 (3.2 ac)
Date Range: Unknown
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: An essentially intact surface scatter of artifacts. Some camping and livestock grazing have taken place on-site. Comments: LA70318 is a very light surface scatter of artifacts located on a sloping ridge top near the northeastern corner of the main unit of the monument (Figure 82). The TJ Corral trail skirts the southern boundary of the site. Artifacts consist of a scattering of lithic debitage and three manos. A single circular concentration of 15 unmodified rocks may constitute the only site feature. Crew members noted no ceramic artifacts. The site appears to be a lithic tool manufacturing area located very near LA10042.

LA70319

Site Type: Artifact scatter
Elevation: 1758 m (5770 ft)
Site Size: 8100 m^2 (2.0 ac)
Date Range: A.D. 550-1150
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: General erosion of the site surface has occurred.

Comments: This is a very light scatter of surface artifacts located on the toe slope of West Fork canyon and on the northern boundary of the main unit of the monument (Figure 83). The artifact scatter contains cores, projectile point fragments, secondary and tertiary flakes, angular debris and at least one mano. Ceramic artifacts are limited. The site appears to be a limited activity area where tool manufacture and food processing took place. The site is just west of LA10041 and may be associated with that site.

LA70320

Site Type: Artifact scatter
Elevation: 1768 m (5800 ft)
Site Size: 2835 m^2 (0.7 ac)
Date Range: A.D. 550-1000
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: When the USFS developed a spring for use at the visitor contact station down stream, the western portion of the site was damaged by heavy equipment. Additionally, natural erosion of the steep slope on which the site sits has affected the artifact distribution.

Comments: This is a very light artifact scatter primarily consisting of chipped stone material and a limited number of sherds (Figure 84). The material is scattered across a steep north-facing slope above the West Fork of the Gila River. This site appears to be an activity area where stone tool manufacture/maintenance occurred and may have been associated with the seep or spring on the western boundary of the site.

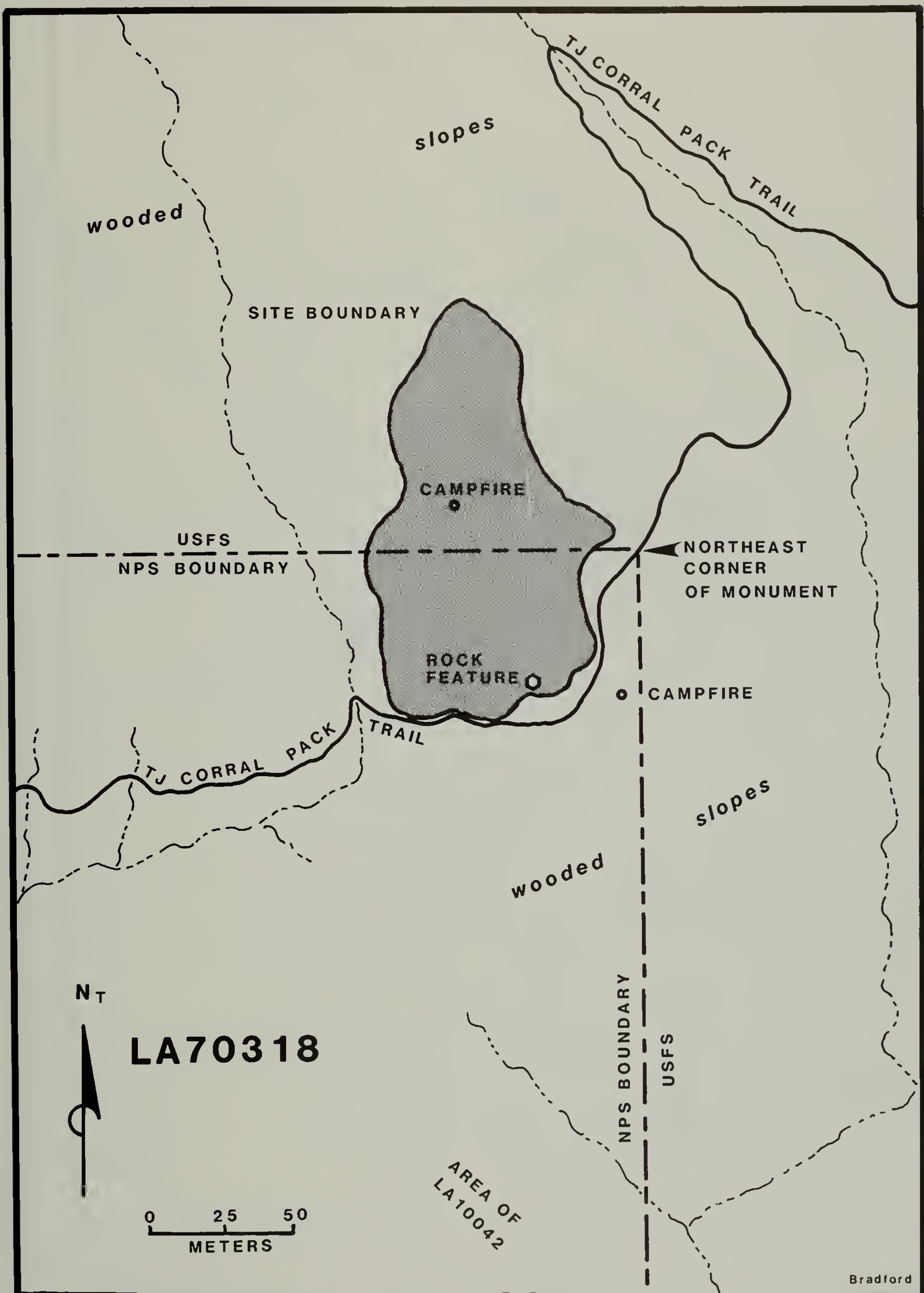


FIGURE 82: Site Map of LA70318.

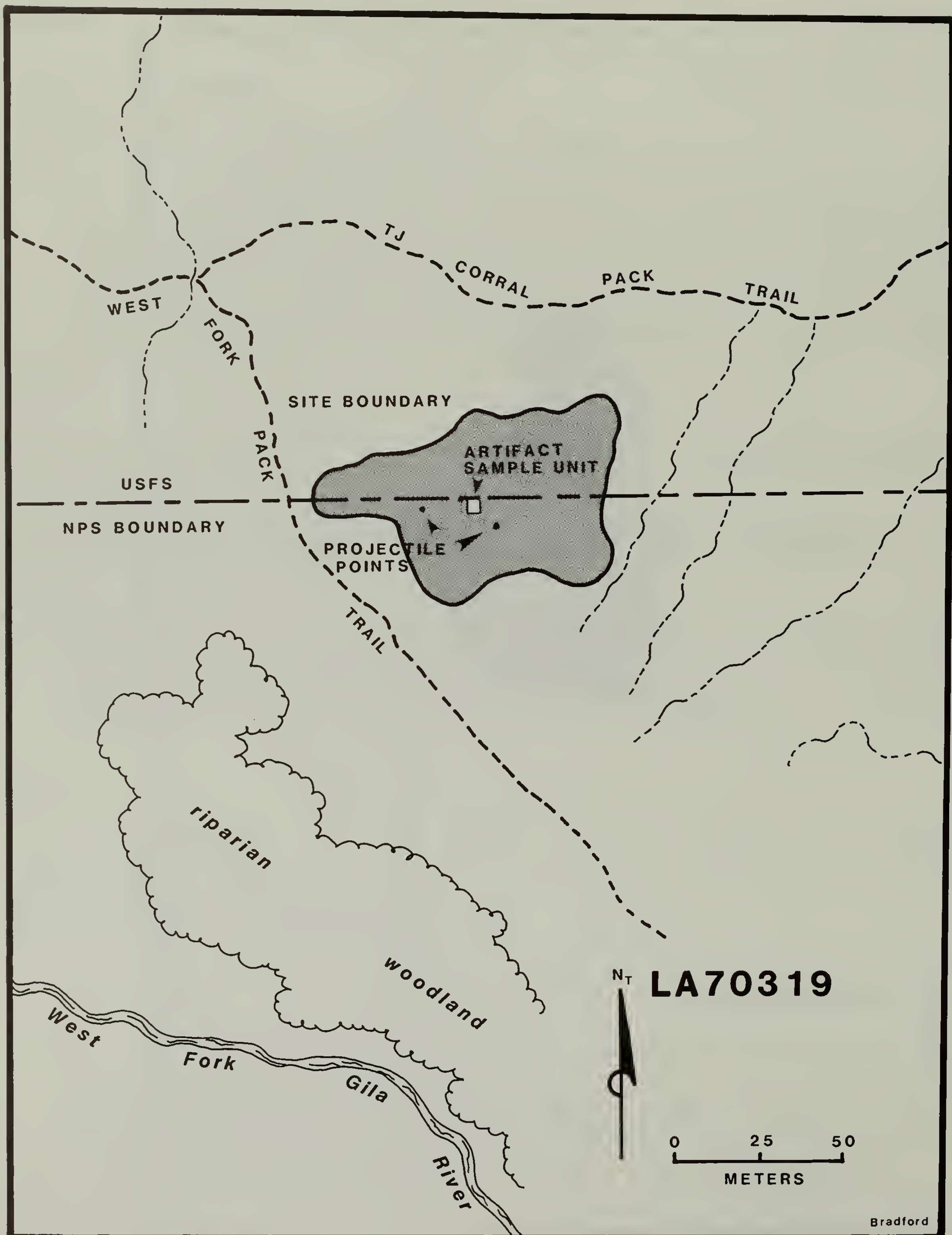


FIGURE 83: Site Map of LA70319.

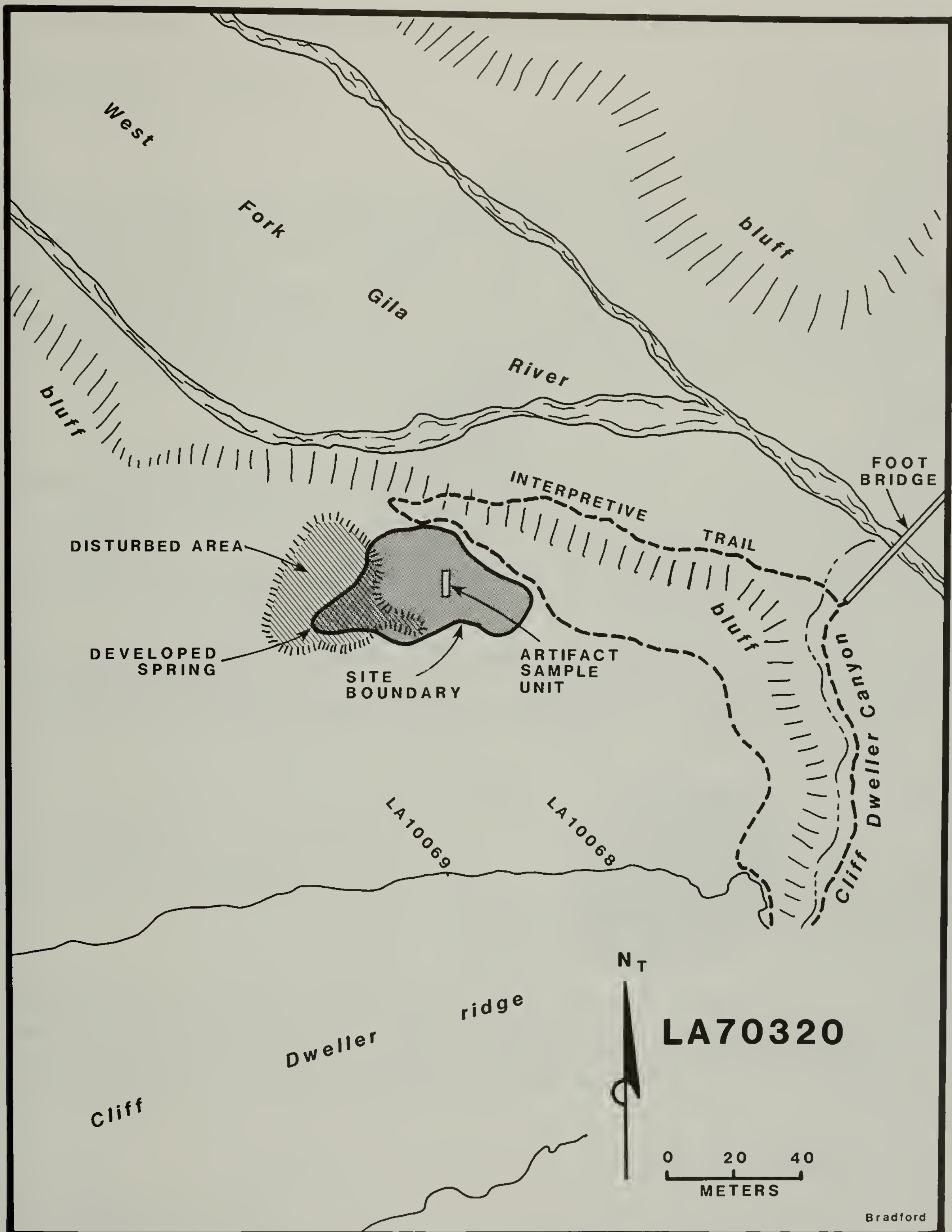


FIGURE 84: Site Map of LA70320.

LA70321

Site Type: Artifact scatter
Site Size: 1295 m^2 (0.3 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Elevation: 1755 m (5760 ft)
Date Range: Unknown

Observations: As of 1989, natural erosion has had the greatest effect on this site. Some evidence of camping and livestock grazing also occurs. The May 1991 forest fire burned over this site, destroying all vegetation. The degree of damage to surface artifacts is unknown.

Comments: LA70321 is a very light lithic scatter of primary and secondary flakes; a core and a projectile point fragment constitute the site (Figure 85). A campfire ring and modern trash in the form of "tin cans" and rifle cartridges evidence later use of the area, probably related to the occupation of Grudging cabin to the northwest outside the monument boundary.

LA70322

Site Type: Artifact scatter
Site Size: 254 m^2 (0.06 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Elevation: 1774 m (5820 ft)
Date Range: Unknown

Observations: Minimal surface erosion as of 1989. The May 1991 forest fire burned over this site destroying most vegetation. Effects to surface artifacts are unknown.

Comments: This is a very small and light concentration of lithic material located at the end of a small ridge near the northwestern corner of the main unit of the monument (Figure 86). The variety of lithic material is indicative that this was a chipping station where stone tool manufacture took place.

LA70323

Site Type: Artifact scatter
Site Size: 176 m^2 (0.04 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Elevation: 1777 m (5830 ft)
Date Range: Unknown

Observations: Limited natural erosion of the site area.

Comments: A very localized, small lithic scatter (Figure 87) of primary and tertiary flakes, bifacial thinning flakes and angular debris are suggestive that this site was similar in function to LA70322 to the north. A single unidentified sherd also was found. This site is at the base of a steep slope and served as an impromptu chipping station for tool manufacture and maintenance.

LA71159 Stone Circle Site

Site Type: Specialized site
Site Size: 16 m^2 (0.004 ac)
Estimated Number of Surface Rooms: None
Elevation: 1829 m (6000 ft)
Date Range: Unknown

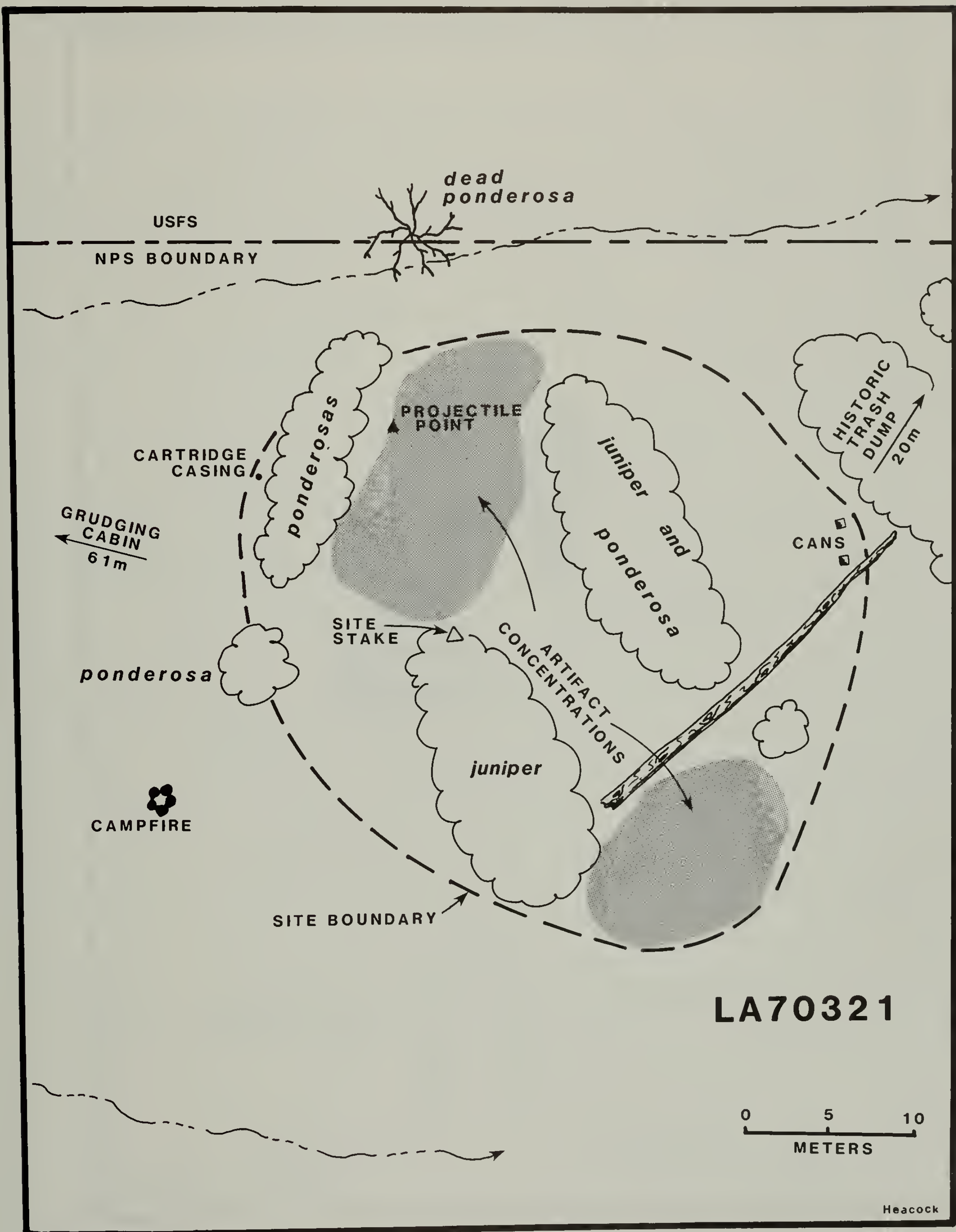


FIGURE 85: Site Map of LA70321.

FIGURE 86: Site Map of LA70322.

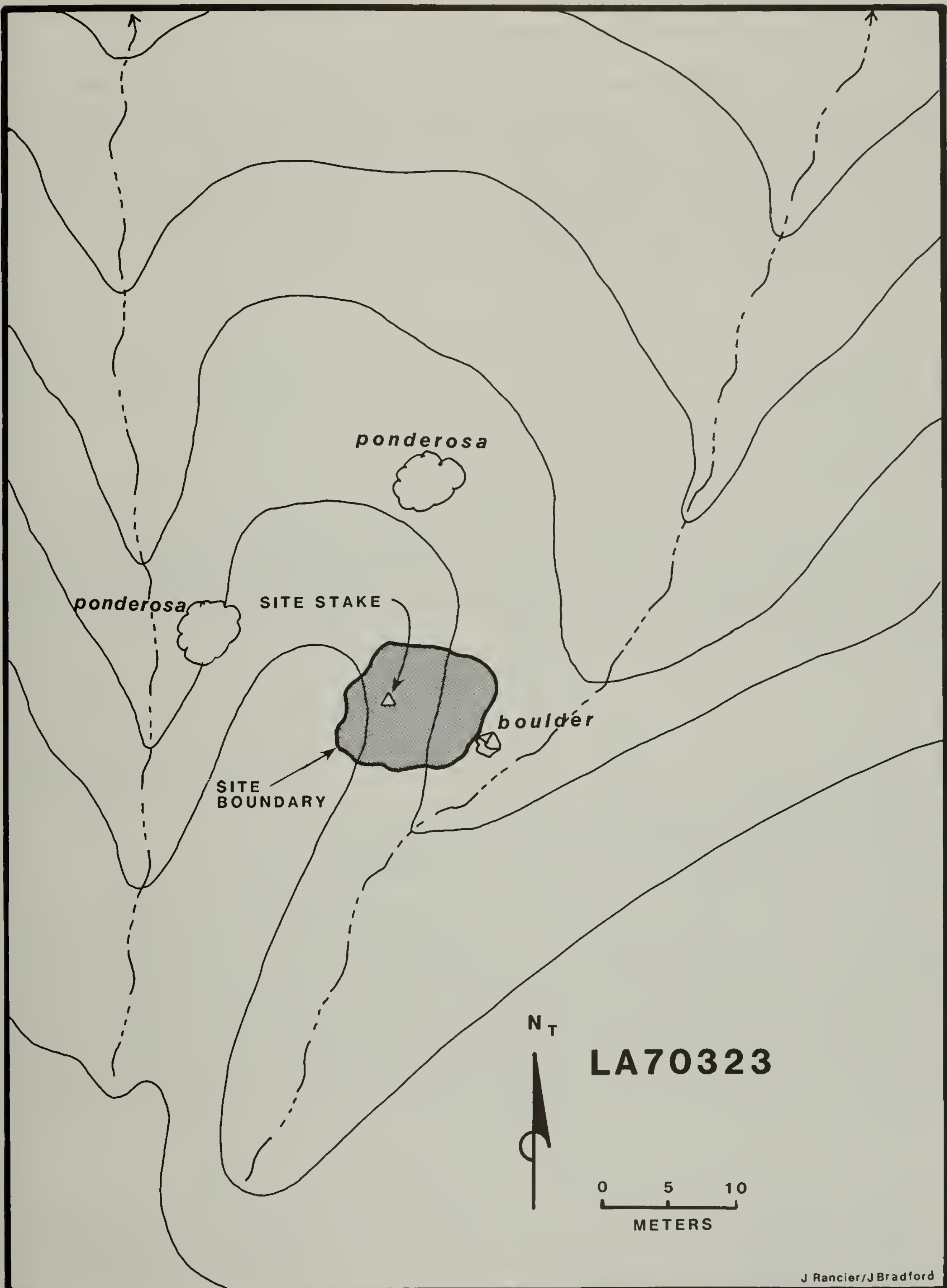


FIGURE 87: Site Map of LA70323.

Estimated Number of Subsurface Structures: None
Observations: Site occurs on bedrock. No damage noted.

Comments: This small site consists of a single feature (Figures 88-90): a circular arrangement of 12 separate stones situated on top and near the very end of the high cliff overlooking the confluence of the West Fork and Cliff Dweller Canyon. A small natural depression occurs in the center of the stone circle and none of the stones shows modification. No artifacts or evidence of use occur with the feature. Lichen is on the underside of some rocks, indicative of a relatively recent origin for the stone circle. The feature does appear in aerial photographs taken of the monument in 1987. Function and date are unknown.

LA71225

Site Type: Artifact scatter
Site Size: 1586 m^2 (0.4 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None
Observations: Limited surface erosion.

Elevation: 1859 m (6100 ft)
Date Range: Unknown

Comments: This site consists of a small sparse lithic scatter situated atop the narrow neck of "Cliff Dweller Ridge" in the main unit of the monument (Figure 91). In addition to the chipped stone material, crew members located a single mano and a groundstone slab fragment. It appears inhabitants tested and worked small stone nodules at this location and that food processing also took place.

LA71226

Site Type: Pueblo
Site Size: 2583 m^2 (0.6 ac)
Estimated Number of Surface Rooms: 2-3
Estimated Number of Subsurface Structures: None
Observations: Livestock grazing is the most obvious site damage.

Elevation: 1399 m (4590 ft)
Date Range: A.D. 750-1250

Comments: LA71776 is a small two to three room fieldhouse situated just above the river floodplain at the toe of the slope below TJ Ruin (Figures 92 and 93). The site affords a view both upstream and downstream and is in the immediate vicinity of agricultural bottomlands along this portion of the West Fork just below its confluence with the Middle Fork. An extensive surface scatter is associated with the structure and a trash concentration is evident to the southeast of the roomblock. Some of the surface scatter may be spill-over from TJ Ruin at the top of the ridge and to the northwest. The site may be associated with the occupation of TJ Ruin.

LA74166

Site Type: Artifact scatter
Site Size: 3750 m^2 (0.93 ac)
Estimated Number of Surface Rooms: None
Estimated Number of Subsurface Structures: None

Elevation: 1768 m (5800 ft)
Date Range: Unknown

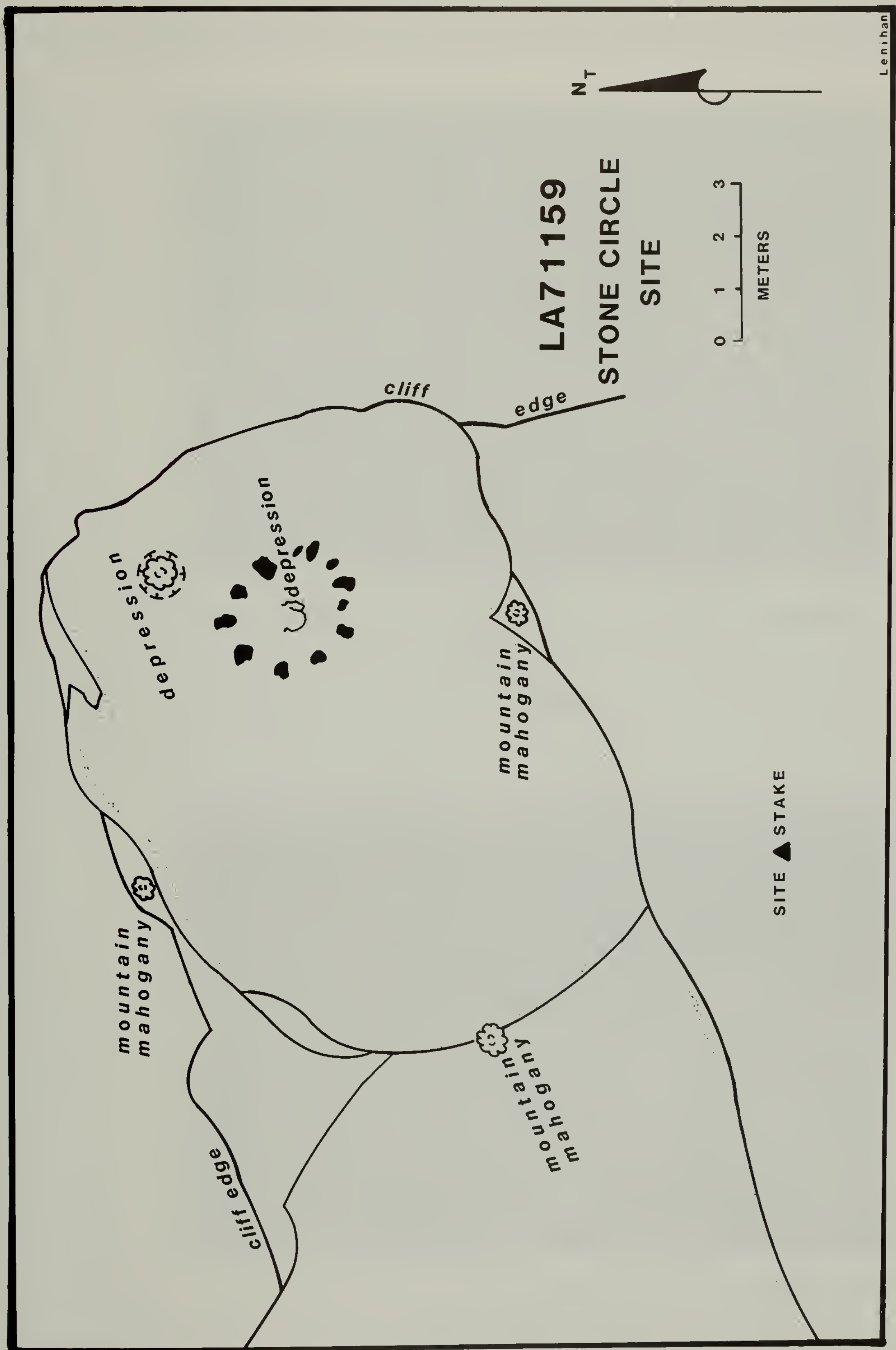


FIGURE 88: Site Map of LA 71159.

FIGURE 89: LA71159, View Northeast of the Stone Circle Site.

FIGURE 90: LA71159, Close-up of the Stone Circle with North Horizon in Background.

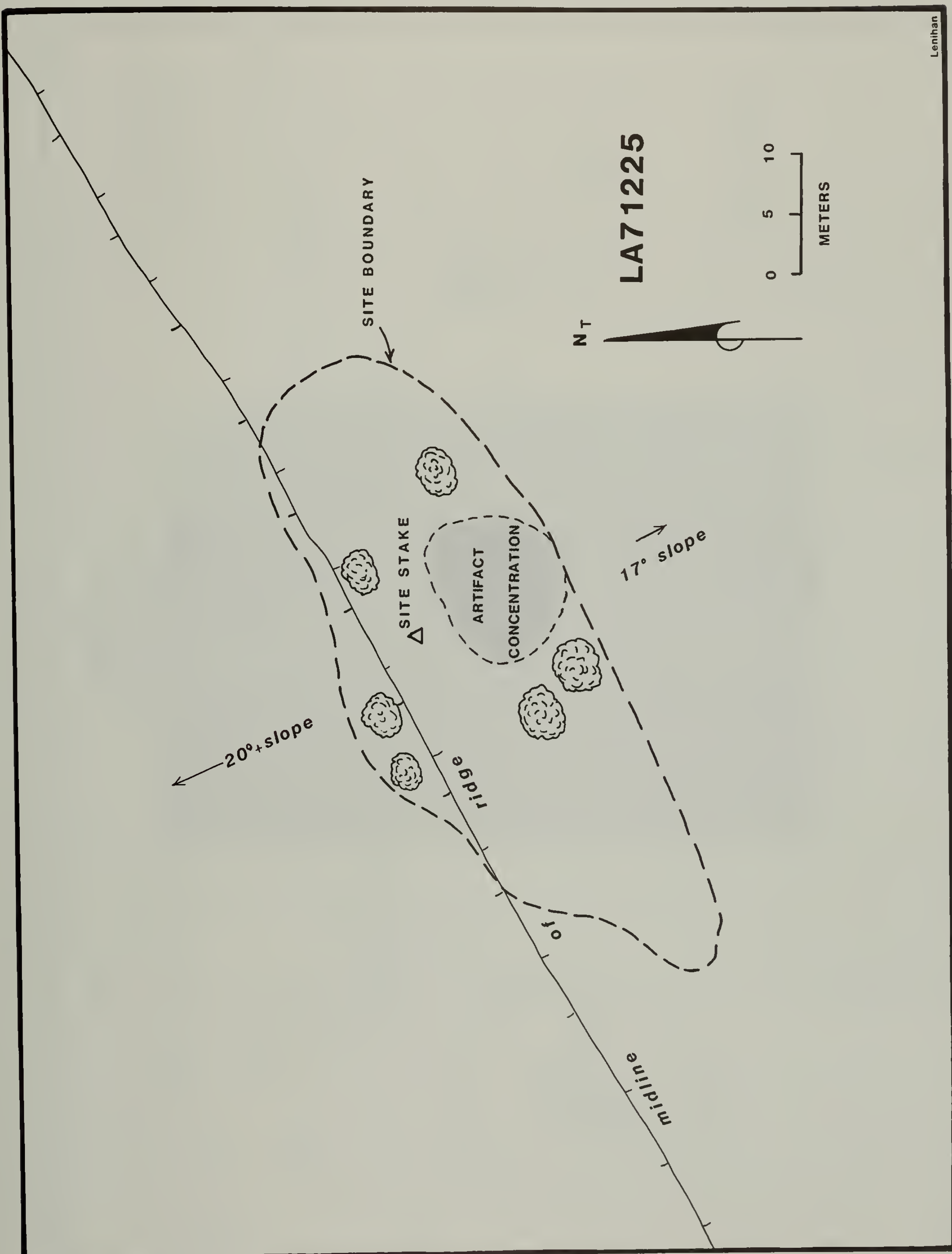


FIGURE 91: Site Map of LA 71225.

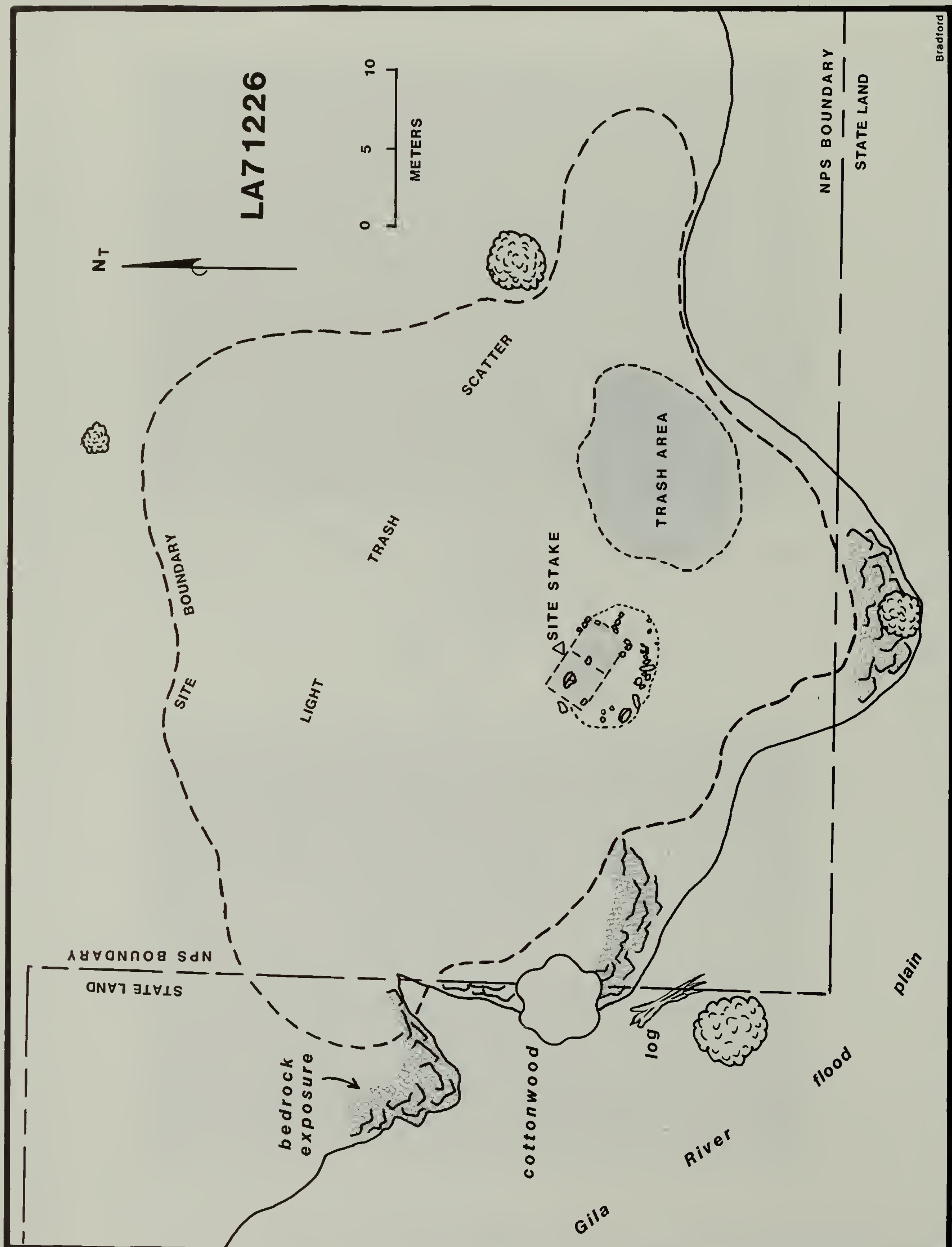


FIGURE 92: Site Map of LA 71226.

FIGURE 93: LA71226, View North of Site Area Below TJ Ruin.

Observations: Site has been cut through by construction of the road from the heliport to the "bone yard".

Comments: A light scatter of lithic material occurring on a ridge slope at the northeastern corner of the TJ unit (Figure 94). This appears to be a locale for acquiring, testing and working lithic material.

For quick reference, Appendix 4 provides the preceding site information in table form, listing, by state site number, information on site type, topographical situation, artifact types and, where possible, date ranges based on ceramic typologies. For the above descriptions, the following section summarizes, by site type, the patterns discerned for archeological sites within the monument. The author also provides a listing of sites within each category.

A SUMMARY OF SITE TYPES WITHIN THE MONUMENT

PITHOUSE SITES LA10006, LA10042 and LA10044

Pithouse Sites include open sites with one or more subsurface structures. Only two pithouse sites occur within the monument; a third extends just inside NPS boundaries at the TJ unit. Additionally, two surface pueblo sites also contain one or more pitstructures. Of the first three, all overlook the primary drainage of the monument; two are at equal elevations and on opposite sides of the drainage, while the third is within 48 m (30 ft) of the same elevation contour. The other two sites, outside the boundaries, also overlook the primary drainage and occur at similar elevations. Thus, the pithouse sites tend to be on elevated locations directly above the primary drainage and at elevations under 1786 m (5860 ft).

PITHOUSE/PUEBLO SITES LA10045, LA54955

These sites have obvious evidence of both architectural traditions. This does not mean that the different architectural styles are mutually exclusive or that the pitstructures predate the pueblos. Only excavation data would provide any delineation of earlier architecture from later architecture on either site listed above. Of these two sites, both sit on elevated benches above the West Fork and each has a strong Mimbres phase occupation. Additionally, both have very large pitstructures that could be perceived as great kivas. The obvious difference between the two is that LA54955 (TJ Ruin) is much larger in areal extent, in numbers of pitstructures, roomblocks and surface rooms, and represents a much longer span of occupation.

PUEBLO SITES LA10041, LA10049, LA10052, LA10055, LA10075, LA10081, LA13658 and LA71226

Pueblo sites are sites exhibiting evidence of aboveground masonry, whether in the form of coursed masonry walls or single courses of horizontal and/or vertical slabs, and include single-room units, multi-room rubble mounds and cliff dwellings.

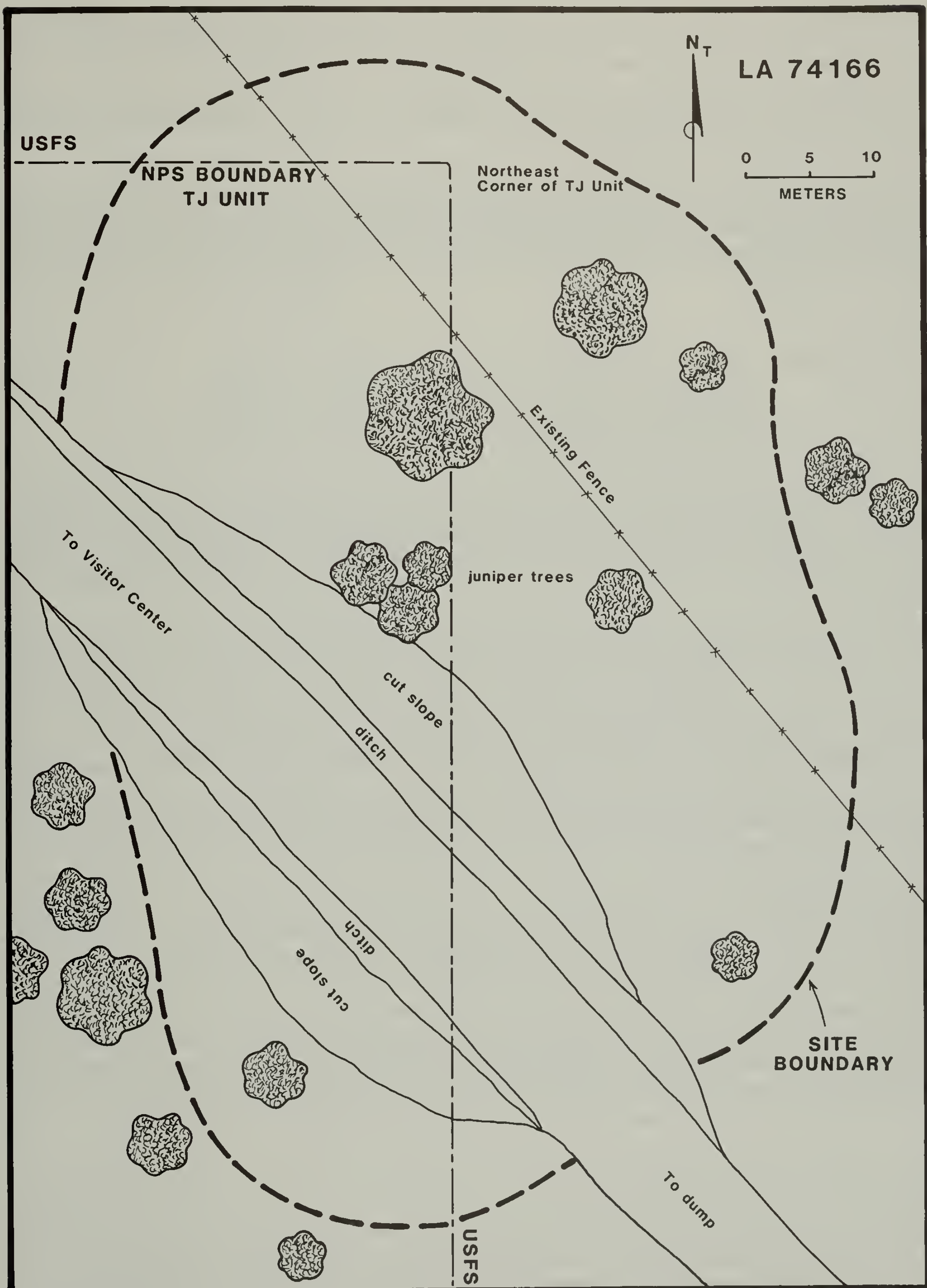


FIGURE 94: Site Map of LA74166.

Although numbers of rooms was not always determinable, reasonable estimates usually were possible due to the shallow fill in most structures. Within the monument sample, there are eight pueblo sites: six sites with one to five rooms; one site with eight to ten rooms; and one site with 40 or more rooms. If the pueblo roomblocks from the Pithouse/Pueblo sites are considered, then the last two categories would include an additional example each; these are LA 10045 with 14 rooms and TJ Ruin with ca. 200 rooms in multiple roomblocks.

Within the monument, pueblo sites show some patterning. Except for the late Gila Cliff Dwellings, construction for all is undressed stone. Although Pueblo sites occur at all elevations of the monument, most are on ridge tops well above drainages; the smaller structures occur more often above 1829 m (6000 ft) in elevation.

ROCKSHELTER SITES LA4913, LA10046, LA10056, LA10057, LA10058, LA10059, LA10060, LA10061, LA10062, LA10063, LA10064, LA10065, LA10066, LA10067, LA10068, LA10069 and LA10085

This category includes all sites associated with rock overhangs except for the cliff dwellings (discussed above) and a granary (see below). Crew members recorded 17 rockshelter sites within the main unit of the monument. Except for one, all occur within the Gila Conglomerate, a natural cliff-forming member that also tends to erode along horizontal planes into many small overhangs, alcoves and caves.

In this sample, these shelters tend to be long usually narrow cavities formed at the juncture of the cliff face and slope. Indications of prehistoric use of the shelters range from possible roof blackening to stacked rocks and artifact scatters, to subsurface features constructed for storage or, perhaps, habitation. Because of the geological constraints related to this site type, 88 percent are within an 11 m (30 ft) elevational range. The orientation of rockshelters and indicated use also show something of a pattern in that those facing the southern quadrant (southwest to southeast) tend to show more evidence of substantial use while those in the northern quadrant (northwest to northeast) tend to show more limited use.

ARTIFACT SCATTERS LA10082, LA10083, LA70318, LA70319, LA70320, LA70321, LA70322, LA70323, LA71225 and LA74166

Artifact Scatters include surface collections of ceramic and/or lithic artifacts not found in association with any constructed features such as cists, hearths, rooms, etc. In the monument sample, 10 sites fall within this category: six composed solely of lithic material and four with both lithic and ceramic artifacts, although in the latter, the ceramic material was quite limited. Also found were 27 Isolated Occurrences composed of similar materials but not warranting site status.

Artifact scatters tend to occur on the more wooded ridge tops (only two are in the canyon bottom) overlooking the drainage of the West Fork. None occur in the southern half of the monument where Cliff Dweller Canyon and the elevated ridge of the southeast monument corner occur. Within the TJ Unit, artifacts are almost continuous across the entire parcel of land. A delineation between TJ Ruin and the Heliport Site (LA35425 outside NPS boundaries) in the area of the "polo field" is impossible. Also, a small lithic scatter in the extreme northeastern corner of the TJ Unit is typical of other sites in the immediate vicinity where lithic procurement and stone working was taking place near the material source.

SPECIALIZED SITES LA10047, LA10048, LA10050, LA10053 and LA71159

Specialized Sites include a group of five sites that appear to have had specific, single purpose functions. These include the remains of a granary in a small overhang, the remains of a purported Apache burial in a small rockshelter, a rock art site situated in a small overhang/ledge, a series of perhaps eight check dams along a minor ridge top drainage, and an arrangement of unworked stone in a small circle atop a high cliff.

SUMMARY

Gila Cliff Dwellings National Monument contains an array of prehistoric site types within its boundaries. Almost every site type recorded for the general area occurs within the monument and reflects a long, but perhaps noncontinuous occupation of the Gila forks area by prehistoric populations. Pithouse architecture represents the earlier site types. Within the monument such sites are not numerous, but do occur along the primary drainage. Later site types, Pithouse/Pueblo sites and Pueblo sites are quite numerous within the monument. These represent the height of area occupation, the time when the population within the region had risen to its highest point and people were occupying the widest variety of topographic locations. Other site types, although not reflective of chronological sequences, were created throughout the monument during the above habitation sequence. Created sites ancillary to the habitation areas are specialized or limited use localities.

ARCHEOLOGICAL SITES OUTSIDE THE MONUMENT

Using Morris' data from his 1968 survey and that from more recent surveys in the general Gila Hot Springs area, site patterns can be extended beyond the monument boundaries for a more complete picture of prehistoric use within the larger Gila forks region. Morris' information over a larger area, although limited, allows us to fill in the pattern of prehistoric land use between the two units of the monument, while USFS and other surveys allow an extension of this information up the Middle Fork, downstream to the Gila Hot Springs and Alum Camp area, and up the East Fork. This information must be used cautiously as these investigations were not performed systematically, are very limited in scope and area, with at least one biased toward the location of Mimbres phase pueblos. However, this is the only available data on which to draw for this region. The files of the Archeological Records Management System (ARMS) at the Museum of New Mexico were consulted for the following USGS quads: Gila Hot Springs, Little Turkey Park, Burnt Corral Canyon, Wall Lake, Middle Mesa, Lilley Mountain, Diablo Range, Copperas Peak and Granny Mountain.

PITHOUSE SITES

In the area upstream from Gila Hot Springs, pithouse sites tend to occur on the north side of the river, occupying barren ridge tops well above the primary drainages. As Late Pithouse Period manifestations, these sites do not necessarily fit the pattern offered by Stuart and Gauthier (1981:186) of a shift from higher inaccessible locations to river terraces. However, for this area, an explanation is the general lack of river terraces in this mountain valley. The pattern could reflect the next best option, selection of wide relatively flat ridge tops immediately above the narrow canyon bottoms where inhabitants could excavate for pitstructures.

Acknowledging that surface ceramics offer limited information for phase assignment, these pithouse sites tend to fall within the Georgetown and Three Circle phases (see Chapter Three, and Morris 1986:16). Hammack's (1966) excavation of 10 Georgetown phase pithouses at Diablo Village and Janes and Reeves' (1974) excavation of an isolated Georgetown phase ceremonial structure at the Lagoon Site, both located between TJ Ruin and Gila Hot Springs, confirm the earlier phase.

Evidence for the subsequent pithouse-to-pueblo transition (Mangus phase) in the area is found at several sites located outside the monument. However, the strongest evidence for this phase comes from two excavated sites: Ice's (1968) information on West Fork Ruin where pitstructures of the Three Circle phase were found among later pitstructures and surface rooms attributed to the Mangus phase; and at LA6537, where Hammack (1966:7-8) excavated a small roomblock of six rooms which he attributes to the Mangus phase. West Fork Ruin, located within the canyon bottom at the mouth of Adobe Canyon, is perhaps second only to TJ Ruin in importance for providing valuable information on the prehistory of the Gila forks region.

PUEBLO SITES

In the immediate area of the West and Middle forks, pueblo sites tend to occur on the south side of the river on elevated ridge tops overlooking secondary drainages (cf. pithouse sites above). Some pueblo sites occur on the north side of the West Fork but are on the base of slopes near the floodplain. To the northeast, on the East Fork above its confluence with Diamond Creek, a very limited sample is indicative that pueblo sites tend to be located on either side of the main drainage, continue to occupy ridge tops or slopes but overlook the main drainage. Only two of the 13 pueblo sites recorded are on side drainages. These pueblos tend to be constructed of undressed masonry and usually have less than 10 rooms, although two pueblos of 20 to 40 rooms are in the vicinity of Fall and Trap springs on the East Fork (Warnica 1975:4-5). Throughout the general Gila Hot Springs area, particularly along the West and Middle forks and their tributaries, several sites within this category consist of rockshelters with masonry walls.

Most of the small open pueblo sites date to the Mimbres phase, indicating settlement along the major drainages and especially in the higher elevated ridges above these drainages. Some probably are over earlier Mangus phase structures, but most appear to be single component Mimbres phase occupations.

ROCKSHELTER SITES

Only nine recorded rockshelters are outside the monument. Two-thirds of these are in the Gila Conglomerate, primarily within tributaries of the West and Middle Forks. Three are in natural crevices of andesite formations. Very little information is known about these sites although the implication is that they also served a multitude of activities through time. Notably, at least eight other rockshelters occurring in the area have masonry walls, almost doubling the number of overhangs used as such.

ARTIFACT SCATTERS

Outside the monument, 21 sites with lithic and/or ceramic debris have been recorded in the West/Middle forks area. At least six of these have pithouses but show no obvious depressions, a common condition on ridge top sites. As with the pattern inside the monument boundaries, most of these sites are on ridges. Sixteen of the known 21 sites are on the higher ridge tops, only four are on slopes near the West Fork drainage, and a single such site is in the canyon bottom at the Heart Bar Ranch. The gravelly ridge top locations on which the sites generally occur tend to be north of the West Fork (a similar pattern to pithouse villages), and tend to have occasional small nodules of obsidian as well as the more ubiquitous andesitic and rhyolitic welded tuffs. When present, ceramic materials tend to be limited in number and consist primarily of plainwares, although there are a few decorated wares sherds.

SPECIALIZED SITES

Morris' (1968) information lists 11 sites outside the monument that would fall into this category. These include his check dams, pictograph areas, rock walls and a ceremonial unit. Only two of these categories have counterparts within the national monument: check dams and pictograph sites.

As within the main unit of the monument, two of the other three check dams are on flat ridge tops and may well be associated with the occupation of small Mimbres phase pueblos nearby. The third check dam is near a drainage bottom downstream from a possible pithouse site although any connection between the two is nebulous.

Pictograph sites occur where bedrock exposures allow application of either red hematite or black charcoal elements. Several such sites occur throughout the immediate area with both small single elements and large panels with numerous elements. The larger sites seem to be located on the more angular exposures of rhyolite near the canyon bottoms and tend to be composed primarily of hematite drawings. As with those pictograph sites within the monument, most fall within in the Mogollon Red Style (Schaafsma 1980:187-191), a style associated with the mountain Mogollon culture, which has a date range extending from early in the Mogollon sequence through the occupation of Gila Cliff Dwellings (Schaafsma 1980:191). Black pictographs are common in the area. Morris (1968c; 1986:18) attributes at least one such site, a small blackened overhang with an inverted human figure pictograph, to Apachean occupation.

As obvious in the above discussion, the monument area is only a part of the prehistoric use of the Gila forks region. Site patterning within the monument does not always reflect the larger pattern seen in the other more numerous sites within the general area. This should be taken into account when attempting to interpret the area prehistory.

To better refine our interpretation of the area, Chapter Eight will provide additional information, using ceramics and on-site chronology both within and outside the monument as well as provide information on site use based on interpretations of stone tool inventories from the same sites.

THE ARTIFACTS

Archeologists conducted an on-site analysis of both ceramic and lithic artifacts to identify, where possible, cultural and temporal associations as well as site function for those sites occurring within the monument. Additionally, ceramic and lithic artifacts collected by Don Morris in 1968 were analyzed to increase the sample size of both artifact categories for sites within the monument, and to attempt comparisons with sites occurring immediately outside the national monument. The studies' aim is to provide a descriptive and typological analysis for the two artifact categories as a first step in answering more sophisticated questions of cultural processes in the Gila forks area.

CERAMIC ARTIFACTS

The purpose of the ceramic analysis was to 1) provide a descriptive summary of the ceramic assemblage studied, 2) date sites based on established ceramic typologies, 3) determine the cultural affiliation(s) of the group(s) that used the sites, and 4) determine, where possible, the overall site function based on functional characteristics of the ceramic artifacts.

CERAMIC ANALYSIS METHODOLOGY

Except for nine sherds, crew members recorded ceramic artifacts from sites within the monument in the field with no collection. When present, at least 50 sherds were identified for each site. If less than 50 artifacts occurred on the site surface, all were analyzed. If more than 50 occurred on-site, the first 50 located made up the sample assemblage. On sites with large numbers of artifacts, sample grids measuring 2 m by at least 2 m were placed in obvious areas of concentrations (i.e., trash areas). Sherds collected by Morris and reanalyzed for this study were processed in the laboratory in Tucson following his fieldwork. A total of 2420 sherds was analyzed. Lonyta Viklund analyzed most of the ceramics and provided a draft report of the results.

References for defining and dating ceramic types for this analysis include Haury (1936b) and Chapman, Gossett and Gossett (1985:197-204) for decorated and plain Mogollon wares, Rinaldo and Bluhm (1956) for Reserve area ceramics, Breternitz (1966) for general dating, and Brugge (1982) for Apache ceramics. Further consultation included Laura Heacock, who conducted the 1988 in-field analysis, and Stephen Lekson, Curator of Archeology at the Museum of New Mexico. Analysts used sherds housed at the Museum of New Mexico, Laboratory of Anthropology as a type collection.

The ceramic collection was sorted into ware categories (brownwares, graywares, whitewares, etc.) with a series of morphological, technical and stylistic attributes monitored for each sherd. These attributes include temper, paste color, surface treatment, paint, design motifs and physical modification. For the most part, analysts identified wares on the basis of surface finish, and secondarily on temper and paste color. For example, the difference between Reserve and other Mogollon brownwares is that Reserve wares tend to be smudged and have highly polished surfaces as opposed to other Mogollon brownwares that are rarely smudged and have spotty polish. Alma plainwares have sand temper, while El Paso brownwares have temper made up of large white angular particles that extrude into the surface finish. Mimbres whitewares have a grayish brown paste, whereas Cibola whitewares have a bright white paste color. Further identification to the type level was based primarily on surface treatment and finish for the plainwares, and on surface texture and design elements for the decorated wares.

Although temper was not considered a primary attribute in defining ware types, sherds were inspected for inclusions using a 10x hand lens. In the field, particular note was made of temper for those sherds not identifiable as to type.

The incidence of worked sherds was recorded. Their presence can potentially provide information on site activities. These sherds often see use in ceramic manufacture as scrapers and as gaming pieces and/or jewelry. Their presence on sites is suggestive of more than temporary use.

Unfortunately, consistency in recording vessel form between the two field sessions was not maintained, thus conclusions dependent on this data are not positive. Nonetheless, many ceramic types are more common in a particular vessel form, e.g., Alma Punched, Scored, Neck Banded and Corrugated usually occur in jar form and Three Circle Red-on-white and Mimbres Classic usually are bowls. To some degree, then, vessel forms were extrapolated from the presence of certain ceramic types.

Due to the wide date ranges of the Mogollon ceramics, gross temporal categories were used to facilitate analysis. Many of the ceramics are Alma wares (41 percent) and, because of their lengthy date range, are not useful in site dating. The same is true of the indeterminate wares which make up 3 percent of the total sample. However, useful types that have relatively limited date ranges do occur in the sample, including the Reserve ceramics San Francisco Red, Three Circle Corrugated and the painted wares.

Results of the reanalysis of the 1968 survey normally agreed with the original analysis. However, when differences occurred, analysts did not relabel or rebag the artifacts and they maintained the original provenience information.

Where possible, sherd counts are totalled for each site by ware and type as presented in Table 2 and general dates are provided for each site based on the ceramic assemblage.

DESCRIPTIVE SUMMARY

With the single exception of ceramic materials from Gila Cliff Dwellings proper (Anderson et al. 1986:113-129), the assemblage analyzed during this project represents the largest ceramic sample studied from the Gila forks area. Its importance lies in that it represents cultural and chronological information from 77 sites within that area. Ceramic traditions of the Mimbres and Cibola Mogollon dominate the sample. The following ceramic wares and types were identified:

MOGOLLON BROWNWARE (1751 sherds)

By far the most abundant ware within the sample, Mogollon Brownware includes the largest variety of identified types. These include Alma Plain, Alma Rough, Alma Punched, Alma Scored, Alma

Cibola Whiteware	Indeterm. Whiteware	Indeterm. Polychrome	TOTAL	GRAND TOTAL	SITE DATES A.D.	SITE NO
		1	2	49	650-1250	4902
			0	1	550-1150	4905
			0	1	750-1250	4906
			12	36	750-1250	4907
			16	56	750-1250	4911
			0	1	1100-1200	4912
			0	1	1050-1250	4913
			8	19	750-1250	4914
			1	17	550-1150	10006
			0	16	550-1150	10007
			0	10	550-1000	10008
			0	1	750-1250	10009
			6	28	750-1250	10014
			0	22	550-1150	10018
			0	91	550-1150	10019
			0	1	1000-1300	10023
			5	14	1000-1150	10026
			3	22	1000-1150	10027
			5	8	750-1250	10028
			40	199	650-1150	10029
			42	149	550-1150	10030
	4		5	15	750-1250	10032
			0	10	550-1150	10033
			0	1	750-1250	10035
			3	19	550-1200	10036
			3	10	750-1150	10037
2			13	62	550-1250	10041
2			3	125	550-1150	10042
7			54	127	550-1200	10044
5	3		92	275	550-1150	10045
			0	2	750-1250	10049
3			47	95	550-1150	10052
			0	8	750-1250	10053
	4	2	63	190	550-1150	10055
			1	13	1150/1600-1900	10056
			2	45	750-1900	10057
			0	1	550-1000	10058
	1		1	2	550-1150	10059
			0	45	550-1150/1600-1900	10060
			0	3	550-1150	10061
			0	3	1600-1900?	10063
			0	51	550-1150/1600-1900	10065
			1	1	1100-1150	10066
1			1	6	1150-1200	10069
			2	7	1000-1150	10071
			1	4	750-1250/1600-1900	10072
			1	2	1000-1150	10073
4	11	1	65	96	1150-1200	10075
			0	1	550-1150	10076
			0	15	550-1150	10078
			1	77	1000-1150	10079
			0	24	750-1250	10080
			2	28	750-1200	10081
2			5	7	750-1200	10082
	2		3	5	550-1250	10083
			1	4	750-1250	10086
	15	1	28	61	650-1100	10087
			2	20	750-1250	10088
			0	31	550-1150	10089
			0	61	550-1000	10090
			0	9	750-1250	10091
			4	11	750-1250	10092
			0	3	550-1150	10094
			0	43	550-1150	10097
			0	7	550-1150	10099
			0	23	1000-1150	10100
			0	4	550-1150	70319
			0	4	550-1000	70320
			0	1	?	70323
		1	2	16	750-1250	71226
			0	5	750-1250	?Prov
26	40	6	546	2,420		

: Sherd Counts and Date Ranges by Type and Site.

SITE NO	UTILITY WARES																						TOTAL
	Alma Plain	Alma Rough	Alma Punched	Alma Scored	Alma Neck Banded	Alma Corrugated	Indeterm. Neck Banded	3 Circle Corrugated	Indeterm. Brownware	San Francisco Red	Reserve Plain Smudged	Reserve Plain Corr.	Reserve Indented Corr.	Reserve Punched	Reserve Scored	Tularosa Pattern Corr.	Cibola Corrugated	El Paso Corrugated	Indeterm. Grayware	Indented Corr.	Apache	Indeterminate Ware	
4902	9	2					1			2	11	8		1								13	47
4905	1																						1
4906															1								1
4907	13						1			2	3	5											24
4911	26	1					1			4	1	7											40
4912																1							1
4913																				1			1
4914	2										4	3	2										11
10006	8									7	1												16
10007	9									7													16
10008	5									5													10
10009												1											1
10014	10									1		3	1			7							22
10018	14									7	1												22
10019	48									42		1											91
10023											1												1
10026	7			1																1			9
10027	6									13													19
10028													3										3
10029	68	36		1	2				1	50		1											159
10030	49	8	1	3			1			1	1	38	4					1					107
10032	1									5		4											10
10033	9																					1	10
10035															1								1
10036	2						1					12				1							16
10037	1											6											7
10041	10											37							2				49
10042	80		1	1					3	34		2					1						122
10044	48							1		16		8											73
10045	98									4		64								8		9	183
10049											1	1											2
10052	15											29								3		1	48
10053	1	1										5	1										8
10055	37	10										76								1		3	127
10056	2																				10		12
10057		2				1					10	3									27		43
10058										1													1
10059	1																						1
10060	18				3					1		1								5	11	6	45
10061	3																						3
10063																					3		3
10065	15	14			1				1		3								4		13		51
10066																							0
10069	3										1	1											5
10071	5																						5
10072											1										2		3
10073	1																						1
10075	8											22								1			31
10076	1																						1
10078	5									10													15
10079	41									35													76
10080	16									1		7											24
10081	6											19								1			26
10082		2																					2
10083	2																						2
10086	1										1	1											3
10087	21									4	1	5	1									1	33
10088	13									3		2											18
10089	27									3												1	31
10090	22	27								12													61
10091	7										2												9
10092	2											4	1										7
10094	2									1													3
10097	31									12													43
10099	7																						7
10100	13									9	1												23
70319	4																						4
70320	2									1		1											4
70323																						1	1
71226	7	1								1	1	2	2										14
?Prov									1		4												5
TOTAL	863	104	2	6	6	1	5	1	6	294	49	379	15	1	2	9	1	1	6	21	66	36	1,874

PAINTED WARES													TOTAL	GRAND TOTAL	SITE DATES A.D.	SITE NO
Mogollon R/br	Indeterm. R/br	3 Circle R/W	Indeterm. R/W	Mimbres Whiteware	Mimbres Boldface	Mimbres Classic	Reserve B/W	Tularosa B/W	Reserve/Tularosa B/W	Cibola Whiteware	Indeterm. Whiteware	Indeterm. Polychrome				
				1								1	2	49	650-1250	4902
													0	1	550-1150	4905
													0	1	750-1250	4906
				9	1	2							12	36	750-1250	4907
				11	3	2							16	56	750-1250	4911
													0	1	1100-1200	4912
													0	1	1050-1250	4913
				4	4								8	19	750-1250	4914
						1							1	17	550-1150	10006
													0	16	550-1150	10007
													0	10	550-1000	10008
													0	1	750-1250	10009
				3	2	1							6	28	750-1250	10014
													0	22	550-1150	10018
													0	91	550-1150	10019
													0	1	1000-1300	10023
				4		1							5	14	1000-1150	10026
				2	1								3	22	1000-1150	10027
				3	2								5	8	750-1250	10028
1		1		27	11								40	199	650-1150	10029
		1		17	5	18		1					42	149	550-1150	10030
				1							4		5	15	750-1250	10032
													0	10	550-1150	10033
													0	1	750-1250	10035
				2		1							3	19	550-1200	10036
				2	1								3	10	750-1150	10037
		1		4			4		2	2			13	62	550-1250	10041
				1						2			3	125	550-1150	10042
2		1	1	27	1	5	5	1	4	7			54	127	550-1200	10044
2		3		49	12	18				5	3		92	275	550-1150	10045
													0	2	750-1250	10049
				36		8				3			47	95	550-1150	10052
													0	8	750-1250	10053
	1			27	3	26					4	2	63	190	550-1150	10055
				1									1	13	1150/1600-1900	10056
2													2	45	750-1900	10057
													0	1	550-1000	10058
											1		1	2	550-1150	10059
													0	45	550-1150/1600-1900	10060
													0	3	550-1150	10061
													0	3	1600-1900?	10063
													0	51	550-1150/1600-1900	10065
				1									1	1	1100-1150	10066
										1			1	6	1150-1200	10069
					2								2	7	1000-1150	10071
				1									1	4	750-1250/1600-1900	10072
					1								1	2	1000-1150	10073
				40	1	8				4	11	1	65	96	1150-1200	10075
													0	1	550-1150	10076
													0	15	550-1150	10078
				1									1	77	1000-1150	10079
													0	24	750-1250	10080
				1			1						2	28	750-1200	10081
		2							1	2			5	7	750-1200	10082
									1		2		3	5	550-1250	10083
				1									1	4	750-1250	10086
		2		10							15	1	28	61	650-1100	10087
				1	1								2	20	750-1250	10088
													0	31	550-1150	10089
													0	61	550-1000	10090
													0	9	750-1250	10091
				1		3							4	11	750-1250	10092
													0	3	550-1150	10094
													0	43	550-1150	10097
													0	7	550-1150	10099
													0	23	1000-1150	10100
													0	4	550-1150	70319
													0	4	550-1000	70320
													0	1	?	70323
	1											1	2	16	750-1250	71226
													0	5	750-1250	?Prov
7	2	11	1	288	51	94	10	2	8	26	40	6	546	2,420		TOTAL

TABLE 2: Ceramic Sherd Counts and Date Ranges by Type and Site.

Neck Banded, Alma Corrugated, Three Circle Corrugated, Mogollon Red-on-brown, San Francisco Red, Reserve Plain Smudged, Reserve Plain Corrugated, Reserve Indented Corrugated, Reserve Punched, Reserve Scored, Tularosa Patterned Corrugated and Cibola Corrugated. This series, unfortunately, also contains the longest time spans of any series in the area and, thus, several of these types alone are inadequate for dating purposes. Mogollon brownwares constitute 72 percent of the overall sample with just three types, Alma Plain (36 percent), San Francisco Red (12 percent) and Reserve Plain Corrugated (16 percent) comprising 64 percent of that sample. Most of these sherds are sand or quartz-sand tempered.

MIMBRES WHITEWARE (444 sherds)

The next most common group is Mimbres Whiteware, comprising 18 percent of the total sample. Types identified in this group include Three Circle Red-on-white, Mimbres Boldface Black-on-white and Mimbres Classic Black-on-white. Most of the Mimbres whiteware sherds were unidentified as to type (12 percent of the total sample) with Mimbres Classic Black-on-white being the most frequently recognizable type at 4 percent of the total sample. When considering the analyses of the ceramics of the two major sites of the area (Gila Cliff Dwellings and TJ Ruin), Mimbres painted ceramics comprise 66 percent of the sample at TJ Ruin (McKenna and Bradford 1989:21) and only 6 percent at Gila Cliff Dwellings (Anderson 1986:126-129).

CIBOLA WHITEWARE (86 sherds)

The more northern Cibola series comprises 4 percent of the survey sample and is limited to Reserve Black-on-white, Tularosa Black-on-white and Reserve/Tularosa Black-on-white. Interestingly, this figure compares favorably with that of Cibola decorated types (6 percent) from the overall collection at Gila Cliff Dwellings (Anderson 1986:126-129). However, when comparing just the painted ceramics from the two collections, Cibola series ceramics comprise 87 percent of the Gila Cliff Dwellings sample and only 10 percent of this survey's painted ceramics. Cibola painted ceramics at TJ Ruin comprise 6 percent of the decorated wares (McKenna and Bradford 1989:21), mirroring this survey's sample.

EL PASO BROWNWARE (1 sherd)

A single sherd of El Paso Corrugated was identified in the survey sample, representing less than 1 percent of the total collection. No other sherds from the Jornada series were found in either the Gila Cliff Dwellings or the TJ Ruin samples.

APACHE GRAYWARE (66 sherds)

Apache sherds compose 3 percent of the total survey sample. These represent occupation of the Gila forks area by Athapaskan people probably after 1600 and perhaps as late as 1900.

INDETERMINATE (72 sherds)

Another 3 percent of the survey sample includes sherds that lack enough attributes to classify to the type level. This group consists primarily of brownware, grayware and whiteware sherds.

DISCUSSION OF THE CERAMIC ANALYSIS

Of the 45 prehistoric sites within the monument, two-thirds contain analyzed surface ceramic artifacts. Of these 30 sites, two were previously studied and reported elsewhere: Anderson et al. (1986) for Gila Cliff Dwellings and McKenna and Bradford (1989) for TJ Ruin. These two sites were not included in any reanalysis for this project, but the reported results are included in Table 2 and in the discussion where pertinent. Eight of the remaining 28 monument sites studied for this project (LA4913, LA10056, LA10058, LA10059, LA10061, LA70319, LA70320 and LA70323) contain so few sherds (four for less) that only a rough time estimate is offered for them in Table 2. Also, in the case of LA10056, a definite Apache component exists, as is true for rockshelter sites LA10057, LA10064 and LA10065.

As for the 63 sites located outside the monument and collected by Morris in 1968, 47 contained ceramic artifacts. However, five of these either had inadequate ceramic information or were recorded in the field but not collected. Of the remaining 42 sites in this category, 10 contain three or fewer sherds and another site had only Alma Plain sherds, rendering 11 additional sites outside the monument marginal for dating purposes.

Most of the sherds have sand or quartz-sand temper and may be locally manufactured, particularly the Reserve/Tularosa types.

Analysis results are indicative that 51 percent of the datable sites are from the Late Pithouse period, primarily pithouse sites of the Georgetown phase with a few contemporary artifact scatters and rockshelter use. Forty-five percent of the sites date to the Pueblo period and include small pueblo sites, artifact scatters, rockshelters and specialized sites. These sites predominantly yield Reserve area plainwares and date to the late Three Circle/Mangus to Mimbres phases. The remaining 4 percent of the sites date to the Apache period, although this last figure is underrepresented as Apache reuse of earlier sites (dual component sites) triples this figure. Within the monument sites, 36 percent of the sites date to the Late Pithouse period and 55 percent date to the Pueblo period. Except for Gila Cliff Dwellings, a strong Tularosa phase site, all Pueblo period sites within the monument fall essentially into the Mimbres phase. The remaining 9 percent within the monument are Apache sites.

Crew members recorded 12 worked sherds during the investigations conducted in 1988-89. Most are sherds with one or two ground edges, but three are spindle whorl fragments. Most of the worked sherds come from Reserve Plain Smudged bowl fragments. All come from sites dating from the latter part of the Late Pithouse through Pueblo periods with most being from the transition time between the two periods. All but one worked sherd were recorded on structural sites.

CONCLUSIONS FROM THE CERAMIC ANALYSIS

Ceramic analysis of the sites within this sample reflect a 750-year continuous occupation of the Gila forks area between A.D. 550 and 1300 with limited occupation by Salado people who may have moved upriver from the Cliff-Gila region in the mid-fifteenth century, and a reoccupation by the more mobile Apache by the 1600s. The major period of occupation occurred between A.D. 750 and 1200, although the paucity of artifacts are indicative that most sites were unoccupied for long periods of time.

Ceramic sites in the Gila forks area were initially late Georgetown and Three Circle/Mangus phase artifact scatters and pithouse sites, followed by an increase in Mimbres phase pueblo occupation along the major drainages. During the Mimbres phase, influence from the south begins to be affected by more northern influences, a drop in population size during the late A.D. 1200s, and a hint of contacts with southern groups just before abandonment of the area, probably by the A.D. 1400s.

Three or four Georgetown phase sites occur within the monument. These are ceramically identified by the preponderance of early brownwares (Alma Plain and Alma Rough) and the occurrence of San Francisco Red. No definite San Francisco phase sites are known within the monument or the general area. Only four sherds represent the hallmark of the San Francisco phase, Mogollon Red-on-brown, within the monument and only three sherds on sites outside the monument. This supports the contention by Fitting et al. (1982:39) that this phase does not exist in the Cliff-Gila area and expands that idea upstream to the Gila forks region.

The argument by Fitting et al. (1982:40) that the Mangus phase supplants the Three Circle phase in the Cliff-Gila area is less well supported for the Gila forks region. The monument sample appears to have only two sites attributable ceramically to either of these phases (LA10082 for Three Circle phase and, perhaps, the earliest occupation at LA10045 for the Mangus phase), very slim evidence that the phase occurred in the area. Two other sites outside the monument have been assigned to these phases (Hammack 1966 and Ice 1968), but full scale analysis of the artifacts recovered from those sites has not been conducted in light of more recent ceramic information for the area. Artifacts from the West Fork Ruin are currently being analyzed and should be a key to resolving this question.

The succeeding Mimbres phase is well represented both within the monument and the Gila forks area in general. One-third of all sites within the monument date to this period. TJ Ruin appears to be the largest concentration of people in the Gila forks area at this time with numerous small contemporary pueblos scattered up the primary drainages and along the ridge tops overlooking them. TJ Ruin, a ca. 200-room pueblo spanning 900 years of occupation between A.D. 500 and 1400, shows a strong Mimbres occupation with hints of outside influences. Here, influences from surrounding areas begin to manifest themselves in the site ceramics and architecture. Beginning in the Mimbres phase, the lines between Mogollon and adjacent cultures begin to blur. During and after this phase influence from the northwest (Reserve/Tularosa) becomes more apparent. Mimbres influence from the south still predominates and the northern Reserve phase does not occur in the Gila forks area, but Cibola area ceramics become more obvious in the artifact record. Contact with Animas phase people to the south also is indicated by ceramics at TJ Ruin at this time (McKenna and Bradford 1989:22).

Decorated ceramics from Gila Cliff Dwellings are predominantly Reserve/Tularosa wares dating to about A.D. 1280 (Anderson 1986:125). Supporting data come from tree-ring dates for the cliff dwellings of A.D. 1276 and 1287 (Bannister et al. 1970:50-51). Also, recent radiometric dating of a *Phaseolus metcalfei* bean (Sample 44-39-7A) places it within a comparable time range of A.D. 1279-1386 (see Appendix 5). A second bean sample (44-39-7B), however, dated to A.D. 1433-1616 (see Appendix 5), introducing a date of about 160 years later. Earlier occupation or use of the cliff dwelling caves is represented by Alma Plain, San Francisco Red and Mimbres Black-on-white ceramics. Later connections with the Animas area are suggested by the presence of polished corrugated and Cloverdale Incised sherds (Anderson 1986:125).

Survey of the monument and surrounding lands, however, shows little or no evidence for other sites of the Tularosa phase occupation of the area. Danson (1957:27) describes what may be a Reserve/Tularosa site on Diamond Creek on the East Fork of the Gila River. The lack of a more extensive survey and/or excavation in the Gila forks area may bias this conclusion. In the larger area, further east but no further south, Laumbach and Kirkpatrick (1983:137-138) found Tularosa phase sites along Cuchillo Negro and Alamosa creeks on the east slopes of the Black Range, while Cosgrove (1932:111) found Tularosa ceramics above Mimbres ceramics at the Villreal Site in the Cliff-Gila Valley.

When comparing survey and analysis results from this project with conclusions about Gila Cliff Dwellings and TJ Ruin, the sites appear to generally fit within the proposed regional perspectives presented.

As reflected in the ceramic record of the monument, Apache occupation of the Gila forks area is well represented. Apache sites are generally very difficult to recognize and thus are infrequent in the archeological record. The occurrence of Apache sherds at five sites within the monument shows a solid use of Cliff Dweller Canyon by these later occupants of the region. The fact that these remains occur only at elevated rockshelter sites that provide access both into and out of the canyon is suggestive that defense or escape was a primary consideration in choosing these locations. Whether this means the sites were selected during the mid-to-late 1800s when escape from patrolling cavalry troops was a selection criteria can only be surmised. Too, if the "Apache Burial" site is truly Apachean, this adds some weight to the record of Athapaskan use of the area, particularly this once hidden side canyon in the heart of the monument.

A systematic survey of the upper reaches of the Gila River is needed to precisely identify cultural settlement and land use patterns. Excavation or limited testing should provide more precise data on sites, confirming or disproving the conclusions based on surface ceramics. Petrographic studies of sherd tempers and clays can provide information on their sources and possible trade patterns.

LITHIC ARTIFACTS

Lithic artifacts from sites in southwestern New Mexico include a wide range of raw material and tool types. Several studies of Mimbres and Cibola area lithic materials have been conducted, including studies on tool types and lithic materials (Wylie 1974, Skinner 1974, Berman 1978 and Moore 1988) as well as lithic exchange system patterns within the Mogollon region (Findlow and Bolognese 1982) and prehistoric subsistence strategies as reflected in lithic tool assemblages (Nelson 1981).

This section presents the results of the analysis of 3636 pieces of chipped stone material and 50 pieces of groundstone. The chipped stone analysis focuses on a descriptive and typological analysis as a basis for future studies in this area. In particular, the following goals were set: 1) provide a descriptive summary of the chipped stone assemblage analyzed; 2) provide information on chronologically sensitive stone tools to date particular sites; and 3) determine, where possible, site function based on the chipped stone assemblages.

LITHIC ANALYSIS METHODOLOGY

For sites within the monument all stone artifacts were analyzed in the field and not collected. As with the ceramic analysis, the collection of chipped stone and groundstone materials collected by Morris in 1968 were reanalyzed in the laboratory to augment the monument sample as well as to increase the sample from the larger Gila forks region. The sampling technique was the same as used for in-field ceramic analysis. Laura Heacock conducted the initial field analysis and Lonyta Viklund conducted the subsequent field and lab analyses and provided a draft report of the results.

The methodology and analysis forms used for this project appear in Appendix 3. These include: 1) a Stone Debitage Form with space for information on sample size or percentage of artifacts analyzed within a sample unit, sample dimensions and sample location, totals for material type and debitage form, description as to broken or utilized, lengths of each artifact, except for broken flakes, platform types of whole artifacts, and number of utilized debitage (attrition versus step fracture); 2) a Stone Tool Form designed to include counts for both formal chipped stone artifacts as well as groundstone; and 3) a Supplementary Artifact Data Form for additional description or illustration of artifacts.

Rancier's glossary (see Appendix 3) guided identification of lithic raw materials based on visual characteristics as opposed to microscopic or chemical compositions. Identification of debitage materials was based on the presence or absence of cortex and/or striking platforms. Other references used during the lithic analysis include Schutt (1980), Gossett and Beal (1984), Beal and McCrary (1984), Chapman (1982), Jones and Scheick (1989), Chapman and Schutt (1977), Kerley and Hogan (1983) and Chapman, Gossett and Gossett (1985). Woodbury (1954) was used for groundstone form definitions. Diagnostic projectile points were temporally defined using the guide set forth by Chapman, Gossett and Gossett (1985:107-109) and further compared to results presented by Shafer (1986:35-39).

All information was then correlated by site, site type, topographical context and proposed site date based on the surface ceramics and projectile points, and then the assemblage was compared to assemblages from other projects in the area.

DESCRIPTIVE SUMMARY

Chipped stone artifacts were analyzed using the following attributes:

MATERIAL TYPE

Fourteen lithic material types were identified during the analysis, including local chert, nonlocal chert, chalcedony, agate, quartzite, obsidian, rhyolite, rhyolitic welded tuff, andesite, andesitic welded tuff, siltstone, basalt, granite and ignimbrite. Eight are igneous rocks, five are sedimentary and one is metamorphic.

DEBITAGE

Debitage includes nonutilized flakes, angular debris and heat shatter. Subclasses of nonutilized flakes include: 1) primary/decortication flakes, those with 90 percent or more cortex on the dorsal surface; 2) secondary flakes, those with less than 90 percent cortex on the dorsal surface and classifiable as bipolar; 3) tertiary flakes, flakes with no cortex on the dorsal surface; 4) bifacial thinning flakes, all flakes removed during the preparation and reduction of bifaces with such characteristics as flaked or flaked/prepared platforms, reduced or dispersed bulbs of percussion, acute platform angles and perhaps lipping on the ventral/platform area conjunction; and 5) bipolar flakes, those that have more than one ventral surface, "orange peel" shape, crushed platforms, sheared cones or bulbs of percussion, or opposing platforms or bulbs of percussion on the ventral surface(s). Most of the chipped stone artifacts fall within this category of debitage.

BIFACIAL TOOLS

This category includes all chipped stone artifacts exhibiting modification on two faces by flake removal and, for this sample, includes projectile points, bifaces, scrapers, gravers, drills and core/choppers.

UNIFACIAL TOOLS

These items include all expedient flake tool forms modified exclusively through use of an otherwise unmodified flake and includes primarily cutting and scraping tools.

HAMMERSTONES

This category includes lithic artifacts exhibiting use from battering over a portion of their surface(s). Here, the category includes a core/hammerstone as the last use of the artifact was for battering.

CORES

This category includes artifacts from which flakes were removed with at least one negative flake scar or negative bulb of percussion. Types of cores used in this analysis include tested, unidirectional, bidirectional, multidirectional, bipolar, bifacial, flake and exhausted cores as described in Appendix 3.

GROUNDSTONE

Groundstone items include stone implements with evidence of grinding on their surface(s) and may be either unmodified or shaped through grinding, pecking or flaking. In this analysis, groundstone items include manos, metates, mortars, abraders, mineral samples and a palette.

DISCUSSION OF THE CHIPPED STONE ARTIFACT ANALYSIS

Of 119 sites included in the overall sample, 83 have stone artifacts. With the 27 isolated occurrences recorded within the monument, the assemblage totals 3636 pieces of lithic material, not including materials from Gila Cliff Dwellings and TJ Ruin. Tables 3 and 4 present data on lithic material types for sites within and outside the monument while Table 5 presents information on artifact types for all sites in the sample.

RAW MATERIAL

All raw material types used in the lithic assemblage are local or obtainable within a 64 km (40 mi) radius of the Gila forks locale. The most common raw material used in the chipped stone assemblage is a white granular chert (28.5 percent). Local cherts occur as small nodules within fissure fillings in the Gila Conglomerate. Although this material has some of the best flaking qualities, to find it as the preferred material is suprising because the size of the nodules is usually less than 5 cm.

Andesite is the second most common material at 22 percent. Andesite is locally available throughout the Gila forks area and is often glassy enough to show conchoidal fractures. Along with rhyolitic welded tuff, it may have been an easy substitute for the less available obsidian.

TABLE 3: Chipped Stone Material Types by Site Within the Monument.

SITE NO.	*LOC CHRT	N-L CHRT	CHALC	AGATE	QTZ ITE	OBSID	RHYO LITE	RHWD TUFF	ANDE SITE	ANWD TUFF	SILT STN	BAS	IG
4913	1												
10006	11/2		2/1	1		1/1			4	2			
10041	36/1	2	12/1	8/1		5/1	11/2	10/1	11	2			
10042	51/3	3/2	29	24/2		15/5	12/4	8/2	27/6	4/1	1/1	1	1
10044	32/1		9	19/2		10/1	8	16	11/2	18	/1	1	
10045	64/4	8	25/1	41/1		19/2	8	30	17	27	2	2/1	
10049	1			2					4	3			
10052	77/3	3	14/1	26		10	28	59/3	15/1	31/1			
10055	37/2	/1	1/1	20/2			3	9	2	8/2		1	
10056	1								1				
10057								2	2				
10058	2/1												
10059						1		2	1				
10060	6	1	1		1/1	1/1		7	6/1	3	1		
10065						2							
10068	10	1	2	4		/1	1		3				
10069	13	1		5	1	1	1		2		1		
10075	15	4	2	21		3	24			16	3		
10082	53/4	2	5/1	13		1	12/1	47/6	72/2	17/8			
10083	39/4	2	9/1	13/1		13/5	2	16	23/3	7			
70318	26/2	/1	7	6		2/2	3/2	2	4/1				
70319	6		12	13/1		2/1	3/1	7/1	4/1	1			
70320	5	3	6/1	3		2	8/1	12/3	6				
70321	18	4	2	3		2/1	2	7/1		3	1	1	
70322	8	1	4	7				25		7	1		
70323	31			10				1		3			
71225	8		3/1	6/1		1		1	5/3	9/2			
71226	11/1	4	1/2			2	4	1/1	16/3	4		1	
74166	20/1		15			1		3		7		3	
IO- 1	4			1			1		2				
IO- 2	7												
IO- 3	2			3				5/1		6			
IO- 4	8		2	1		10/1							
IO- 5	3			3			/1		1	1			
IO- 6	/1							3	1/1	1/1			
IO- 7	4			4				1/1					
IO- 8			1										
IO- 9	1												
IO-10										1			
IO-11				1									
IO-12	1												
IO-13			1						1				
IO-14				1									
IO-15										1			
IO-16				1									
IO-17	1												
IO-18									1	2			
IO-19	4	1								3/1			
IO-20										1			
IO-21	1							1					
IO-22	1											3/1	
IO-23	1												
IO-24	1												
IO-25				2								2	
IO-26			2						2	1		1/1	
IO-27	2			1								1	
Debit	622	40	167	263	2	104	131	275	243	190	10	15	1
Tools	/30	/4	/11	/11	/1	/22	/12	/20	/25	/16	/2	/3	/0
TOTALS	652	44	178	274	3	126	143	295	269	206	12	18	1
PERCENT	29	2.8	8.0	12.3	0.1	5.7	6.4	13.3	12	9.3	0.5	0.8	0.04

*LOC CHRT = local chert; N-L CHRT = non-local chert; CHALC = chalcedony; QTZITE = quartzite; OBSID = obsidian; RHWD = rhyolitic welded; SILTSTN = siltstone; BAS = basalt; ANWD = andesitic welded; IG = ignimbrite; 1/1 = debitage/tool counts

TABLE 4: Chipped Stone Material Types by Site Outside the Monument.

SITE NO.	*LOC CHRT	N-L CHRT	CHALC	AGATE	QTZ ITE	OBSID	RHYO LITE	RHWD TUFF	ANDE SITE	ANWD TUFF	SILT STN	BAS	GRAN ITE
4900	2/1		/1			3	/1	1	2				
4902						2/1			1				
4904									/1				
4905							1		/2				
4906									3	/1			
4907	4/3		/1				1						
4911	2					/1			6/2	1			
4912	/1								1/1				
4916						1			4/1	1			
10007			1	/1			/2						
10008	1			2		3			3				
10014	1		1			2	/1		1/3	1/1			
10018				1			1		3/1	2			
10019		2					2		18/4	/1			
10022	1						2		17/2	2			
10023	1					2			9/4				
10026			1					1	9/1				
10027	1/1					3	1		8/2				
10028									1/1				
10029	3/5					1/2			7/7	4			
10030	5/1			2					/1				
10031									3				
10032	2		1			/1	/1		6				
10033	6		1			6/4			14/2	4			
10035									2	2			
10036						1	2		2/1				
10037									1				
10051	54/2	1	33/2	3		17/2	5	3	38/2	9			
10071	5		1/1			1	2	1	43/2	5		/1	
10072		2	1			1/1			4				
10073	9		1	1			3	1/6	22/1	3			
10074	9/1	1	1			/1	3		44/2	3/3			
10076	9/1	2	/1	1		13		/1	30/4	7		/1	
10078	1					1							
10079	2		1			1	/1		4				
10080	18/1		5	5		1	1		4/1	2			
10081	18/1	1	1	10	/1			4/4	3	7/1	1		
10086	1					1	1			1			
10087	7/2			2		6/1			4/4	2/1	1	1	
10088	3		1			2			4/1				
10089	2								7/2	2			
10090	10					2	3	/1	6	2/1			
10091	8		2	2		1/11			11/1			1	
10092				1		1				/1		1	
10094	2								3/1				
10097	3					2	1		4/2				
10098	7	/1	2	2		38/1	1		16/2	11			
10099	10/1	1	4	2			3		27/4	14			
10100	6		1	3			1		14/3	6			
Unkwn	84/9	4/1	12	21		43/9		12	54	28/1		1	1
Debit	297	14	71	58	0	155	34	23	463	119	2	4	1
Tools	/30	/2	/6	/1	/1	/35	/6	/12	/68	/11	/0	/2	/0
TOTAL	**327**	**16**	**77**	**59**	**1**	**190**	**40**	**35**	**531**	**130**	**2**	**6**	**1**
(%)	23	1.2	5.4	4.2	.08	13.5	2.8	2.5	37.5	9.2	.16	.42	.08

*LOC CHERT = local chert N-L CHERT = non-local chert CHALC = chalcedony QTZITE = quartzite
OBSID = obsidian RHWD = rhyolitic welded SILTSTN = siltstone BAS = basalt
ANDW = andesitic welded MOACY = mouth of adobe canyon

TABLE 5: Chipped Stone Artifact Types by Site.

SITE NO.	PRIM FLK	SEC FLK	TERT FLK	BIF THIN	BI-PLR	ANG DEB	HEAT SHTR	PROJ PT	BI-FACE	UNI-FACE	CORE	HMR STN	TOTAL
LA 4900		2	5			1			3				11
LA 4902	1		2						1				4
LA 4904											1		1
LA 4905		1							2				3
LA 4906		1	1			1				1			4
LA 4907		1	3			1		1	3				9
LA 4911	1	5	2	1				1	2				12
LA 4912	1								1	1			3
LA 4913			1										1
LA 4916	1	3	1			1			1				7
LA 10006	1	9	8			3		1	2	1			25
LA 10007		1						1	2				4
LA 10008	1	3	3			2							9
LA 10014	1		4			1			5				11
LA 10018		4	2			1			1				8
LA 10019		5	16			1			1	4			27
LA 10022		5	17						2				24
LA 10023		4	7			1			4				16
LA 10026	1	1	8				1		1				12
LA 10027	1	1	9	1		1		1	2				16
LA 10028		1								1			2
LA 10029	2	8	8			1			13	1			29
LA 10030		2	3			2			2				9
LA 10031		1	1			1							3
LA 10032			8	1				1	1				11
LA 10033	3	5	17	2		4			6				37
LA 10035	3		1										4
LA 10036	2	2	1						1				6
LA 10037		1											1
LA 10041	4	41	31	4		15	2		1	1	5		104
LA 10042	20	34	70	17	1	25	8	1	4	4	15		199
LA 10044	1	18	73	4	2	19	7	1	3		4		132
LA 10045	8	41	139	20	3	22	12	1		4	4		252
LA 10049	1	1	7							1			10
LA 10051	10	68	45	3		39			5	2	1		171
LA 10052	11	76	83	11		51	10	1	4	2	4		253
LA 10055	4	28	38	1		10	1	1		3	3		87

TABLE 5: A list of Chipped Stone Artifact Types for all Sites in the Sample (continued).

SITE NO.	PRIM FLK	SEC FLK	TERT FLK	BIF THIN	BI-PLR	ANG DEB	HEAT SHTR	PROJ PT	BI-FACE	UNI-FACE	CORE	HMR STN	TOTAL
LA 10056	1		1										2
LA 10057			4										4
LA 10058		1				1				1			3
LA 10059		3	1										4
LA 10060	4	8	11	1		3		1	2				30
LA 10065		2											2
LA 10068		6	8	6		1		1					22
LA 10069		4	12	5		1	3						25
LA 10071	4	20	28	4	1	1		2	2				62
LA 10072	1	2	4			1					1		9
LA 10073	2	19	14			5			4	1	2		47
LA 10074	3	18	33	1		8		2	4		1		68
LA 10075	6	14	58	2		6							86
LA 10078	2	13	38	2		7		2	5		1		70
LA 10078		1	1										2
LA 10079		5	2		1				1				9
LA 10080	4	9	18			7			2		1		39
LA 10081	8	16	15			5	1			1	6		52
LA 10082	25	84	87	2		33	11		2	4	18		246
LA 10083	9	24	53	11	3	18	6	5	8		1		138
LA 10088		2	1			1							4
LA 10087		8	9	2		4		1	4	2	1		31
LA 10088		2	7			1		1					11
LA 10089		1	9	1					1	1			13
LA 10090	3	5	15					1		1	1		26
LA 10091	4	8	11			2			2				27
LA 10092			2			1			1				4
LA 10094	2	2				1			1				6
LA 10097		1	7	1		1			2				12
LA 10098	5	24	34	3		11			3		1		81
LA 10099	3	16	33	2		7		1	3		1		66
LA 10100	1	8	18			4			1	1	1		34
LA 70318	1	10	28			9	2		3	1	4		58
LA 70319	2	8	18	11	2	2	3	2			5		53
LA 70320	2	4	28	8		3		1	3		1		50
LA 70321	4	6	21	7		1	4	1			1		45
LA 70322	3	3	36	7		2	2						53
LA 70323		7	29	1		5	3						45

TABLE 5: A list of Chipped Stone Artifact Types for all Sites in the Sample (continued).

SITE NO.	PRIM FLK	SEC FLK	TERT FLK	BIF THIN	BI-PLR	ANG DEB	HEAT SHTR	PROJ PT	BI-FACE	UNI-FACE	CORE	HMR STN	TOTAL
LA 71225	6	11	13			3			2		3	2	40
LA 71226	1	7	29			7		1	3	1	2		51
LA 74166	7	6	18	8		9		1			1		50
NO PROV.	22	80	116	2		39	1	2	17	1			280
IO 1	1	1	3				1				2		8
IO 2			7										7
IO 3	2	1	11			2			1				17
IO 4	2	6	7	4	1	1					1		22
IO 5	1	1	3			1	1		2				9
IO 6		3									4		7
IO 7	1	3	2			2	1				1		10
IO 8		1											1
IO 9			1										1
IO 10											1		1
IO 11											1		1
IO 12		1											1
IO 13		1	1										2
IO 14			1										1
IO 15											1		1
IO 16		1											1
IO 17		1											1
IO 18		1									2		3
IO 19	2	1	5							1	1		10
IO 20		1											1
IO 21		1	1			3					1		6
IO 22			1										1
IO 23								1					1
IO 24	1												1
IO 25		2	1			1							4
IO 26	4	1	1								1		7
IO 27		1	2			1							4
TOTAL	225	843	1,525	156	14	424	80	37	152	42	106	2	3,606

Andesitic welded tuff (9.2 percent), agate (9.2 percent), rhyolitic welded tuff (9.1 percent), small waterworn pebbles of obsidian (8.7 percent), white chalcedony (7 percent) and rhyolite (5 percent) compose the bulk of the lesser utilized materials. Andesitic welded tuff occurs in massive formations throughout the Gila forks region and rhyolite also is abundant. Rhyolitic welded tuff is locally available from the mouth of Cliff Dweller Canyon downstream to Gila Hot Springs. It often approaches the glassiness of an opaque obsidian, which would account for its equal representation with obsidian in the artifact sample. Agate, less used as a tool material, also occurs in the same context as the local cherts, is similar in size, and the two often grade into one another. Chalcedony occurs in the same context as do chert and agate.

Obsidian is found locally as small nodules both on ridge tops and in drainage bottoms. Cosgrove (1947:20, 62-63) noted the occurrence of obsidian on archeological sites of the Gila forks area on the Middle Fork and Hammack (1966:2-3) on the West Fork. Obsidian comprises 13 percent of the chipped stone collection from Gila Cliff Dwellings (Teague 1986:139-153) and 10 percent of the surface analysis sample at TJ Ruin (McKenna and Bradford 1989:31, Table 5). Small nodules were noted in several areas during this survey, particularly on ridge tops where the Gila Conglomerate is eroding. This implies that obsidian occurred with older parent materials, was eroded and redeposited into materials forming the Gila Conglomerate, and has since eroded out of that formation, thus providing a local, but, limited obsidian source quite similar to that described for Mule Creek 64 km (40 mi) to the west-southwest. Mule Creek has long been suspected as the obsidian source for prehistoric peoples of the Gila forks although Lekson (1992, personal communication) suggests that Ewe Canyon may be a possible source area. Findlow and Bolognese (1982:300) state that Mule Creek obsidian is available over a wide area, including numerous small tributaries of Mule Creek within Catron and Grant counties and, in Arizona, Greenlee County. The geology of this source area is the same andesite and rhyolite formations that occur in the Gila forks region (NMGS:1982) and is strongly suggestive that the Mule Creek obsidian "field" extends eastward to include the Gila forks region.

Nonlocal cherts at 1.6 percent, basalt at 0.6 percent, siltstone at 0.4 percent and quartzite at 0.1 percent round out the trace amounts of lithic materials used, while a single example each of granite and ignimbrite also were recorded. Basalt occurs a few miles southeast of Gila forks and the material identified as siltstone may actually be a very fine-grained welded tuff. The nonlocal cherts are those not identified from local sources during this survey; no local sources for quartzite, granite or ignimbrite are known. All of these latter materials, if not actually locally available, probably were imported from surrounding areas and are believed to occur within a 64 km (40 mi) radius of the Gila forks confluence (see Chapter Two).

DEBITAGE

Debitage (N = 3279) comprises 91 percent of the chipped stone material analyzed. Within this class tertiary flakes (47 percent), secondary flakes (26 percent) and angular debris (13 percent) dominate the assemblage, while primary flakes (6.8 percent), bifacial thinning flakes (4.7 percent), heat shatter (2.2 percent) and bipolar flakes (0.4 percent) are less represented. Because tertiary flakes comprise almost half of the lithic debitage class tool manufacture and maintenance probably consistently occurred on-site (Gossett and Beal 1984:305). Except for obsidian at 18 percent, 25 to 35 percent of the most commonly chosen raw materials were broken during the reduction sequence.

Andesitic welded tuff comprises 20 percent of the primary flakes with obsidian following at 17 percent. Obsidian dominates the bipolar flakes (73 percent), indicating that the flakes were most likely removed from nodules too small to be held in the hand.

TOOLS

A total of 331 tools was identified during the analysis and represents 10 percent of the chipped stone assemblage. Four major categories of tools were found, including bifacial tools, unifacial tools, hammerstones and cores, with subcategories of artifacts occurring for bifacial tools and cores.

BIFACIAL TOOLS. This category comprises 49 percent of the total chipped stone inventory. Cutting/scraping tools dominate the sample with scrapers being the most ubiquitous bifacial tool, knives and blanks following, and drills and gravers being the least represented (see Figures 95 and 96). Projectile points compose 10 percent of the stone tool assemblage and are discussed separately below. Most (62 percent) bifacial tools were fashioned from igneous rocks; sedimentary rock was used only half as much (35 percent). This pattern is likely a reflection of the availability of good quality, chippable igneous rocks in the immediate locale and did not require searching out sources of chert, etc. for use. Although such desirable materials as chert, chalcedony and agate are available, their relative small size was a limiting factor in tool manufacture.

PROJECTILE POINTS. The projectile points from this survey were compared to the projectile point chronology developed by C. Gossett (1985:104-136) for the Upper Gila region. Although absolute dates are unapplicable to the chronology, general periods are defined, such as Late Archaic, Early and Late Pithouse and Mimbres/Salado. This study found 10 percent (N = 2) of the total sites contain Augustine and San Jose style projectile points and date to the Early and Middle Archaic; 50 percent of the sites (N = 10) date to the Late Archaic/Early Pithouse periods; and 40 percent of the sites and one isolated artifact (N = 8) date to the Late Pithouse/Mimbres/Salado periods.

Nineteen sites provided both datable ceramics and projectile points. When the projectile point typology dates are compared to the dates defined by the associated site ceramics, 53 percent (N = 10) of the site dates agree. However, 47 percent (N = 47) do not agree, the ceramic dates being consistently later than the projectile point dates. For the earlier periods (Early to Middle Archaic), 50 percent of the cross dates do not agree, but the sample (N = 2) is too small to be meaningful. For the later periods (Late Pithouse/Mimbres/Salado) six of seven sites agree in cross dating. The main problem is in the middle periods (Late Archaic/Early Pithouse) where fully two-thirds (six of nine) of the sites do not concur in cross dating. Obviously, a major problem in dating is inherent during this period where a wide variety of San Pedro style projectile points were used and the early nondescript Mogollon ceramics occur. This leads to another potential problem in this sample where 19 percent of the sites with diagnostic projectile points have no associated ceramics.

A comparison of this sample also was made with Shafer's (1986:35-40) study of projectile points at the NAN Ranch site. Most of the projectile points recorded in this survey fall into Shafer's Group 4: dart points primarily from the Archaic to Late Pithouse periods but found in later contexts as well, perhaps as curated items or material collected for reworking into later style points (Figures 97 and 98f). At least four other specimens fall into his Group 3 (Figure 98e and i; Figure 99f and h), small corner-notched projectile points that, according to Shafer (1986:38), mark the transition from the atlatl to the bow in the Mimbres area by A.D. 1000. Only about two examples of Shafer's Group 2 projectile points occur in this sample (Figure 99b and d); those being small side-notched points attributed to the Classic Mimbres phase (Shafer 1986:37). The small triangular points with multiple side notches of Shafer's Group 1, which date to the Classic Mimbres, do not occur in this sample.

If one compares the results from the two analysis methods above, the results are similar. Although dating periods are broken down into different blocks, the general trend holds. Where 12 projectile points dated to the Early Archaic to Early Pithouse under Gossett's scheme, 11 dated to the same periods using Shafer's method. Gossett's approach tended to break the points into finer time

FIGURE 95: Bifacial Chipped Stone Tools.

FIGURE 96: Drills.

FIGURE 97: Projectile Points of the Early Periods.

FIGURE 98: Projectile Points.

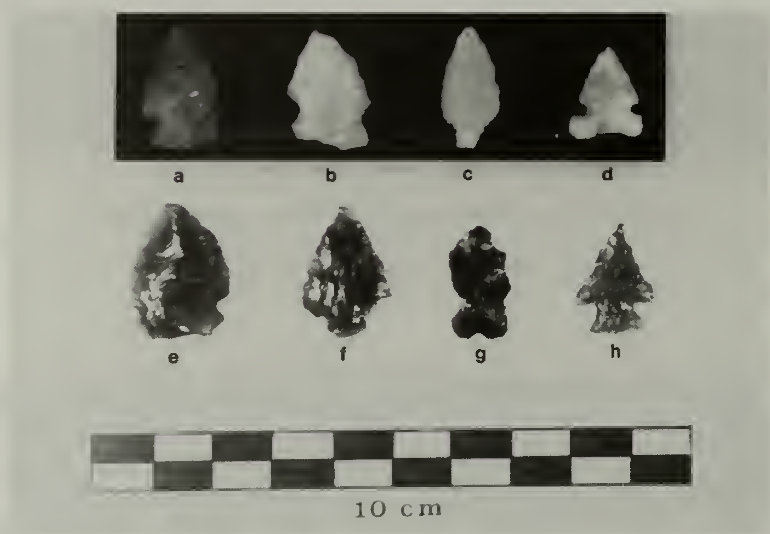


FIGURE 99: Projectile Points of the Later Periods.

periods (i.e., Early, Middle, Late Archaic and Early Pithouse), while Shafer's method tended to lump them into one large time span. Gossett's method tended to lump eight of the points into the Late Pithouse to Mimbres/Salado period, while Shafer's system placed four points in the Late Pithouse period and three points in the Mimbres phase, a reversal of the pattern. In either case, the results were very similar for this particular sample. Shafer's approach is promising and could hold the key to future projectile point analyses when using collections from controlled excavations rather than surface artifacts.

UNIFACIAL TOOLS. Flakes removed from cores for eventual tools often exhibit prepared platforms. While unifacial tools make up 12 percent of the chipped stone tool assemblage, less than one percent of the lithic assemblage exhibits evidence of prepared platforms, suggestive that tool makers preferred expedient use of debitage. Most are retouched secondary and tertiary flakes.

Most utilized flakes are andesite (43 percent), followed by obsidian (19 percent) and chert (9 percent). Use patterns were recorded as either step fractures resulting from scraping hard materials such as wood and bone, or as attrition resulting from cutting and/or sawing softer materials (such as plants, leather or rawhide) as well as hard materials (Schutt 1980). Attrition occurs more often than step fracture (88 versus 9 percent), suggestive that utilized flakes were used more often for a variety of jobs.

HAMMERSTONES. Only two hammerstones are included in this analysis, one being a reused core. All hammerstones exhibit battering on ridges only, indicating use was focused over a small field such as in tool manufacture.

CORES. Eight types of cores defined for this analysis were identified: tested; unidirectional; bidirectional; multidirectional; bipolar; bifacial; flake; and exhausted. Most of the cores came from sites within the monument, probably due to collection bias against cores during the 1968 survey. Of the overall sample, 62 specimens are of six different igneous rock types while 31 specimens are of five sedimentary rock types (Table 6). Cores comprise 32 percent of the chipped stone tool assemblage. Most are primary, multidirectional types indicative that core reduction was not conducted methodically.

The overwhelming majority of cores analyzed are multidirectional and of igneous material, followed by about half as many tested cores also of igneous materials. This pattern may be explained simply by rock size: the predominant igneous rocks of the immediate area are larger than the available sedimentary rock nodules and, because of this size difference, the igneous rock cores can be worked from several directions to acquire more desirable flakes.

GROUNDSTONE ARTIFACTS

Groundstone artifacts were not numerous; only 50 artifacts were analyzed. Six categories of artifact type were identified, including manos, metates, mortars, abraders, palette and mineral. Mortars are nonportable features located in bedrock outcrops within a site. In-depth use/wear analyses were not conducted on the artifacts. Identification of type, material, condition and counts was the basic level of analysis used. Table 7 summarizes the type of groundstone artifacts by site and Table 8 presents information on groundstone artifacts by material type.

Sixty-three percent of the groundstone artifacts are manos or mano fragments and 20 percent are metates or metate fragments, suggestive that food processing was of primary importance at sites

TABLE 6: Cores by Type and Material.

	TESTED	UNI-DIREC	BI-DIREC	MULTI-DIREC	BI-POLAR	BI-FACIAL	FLAKE	EXH	TOTAL
Sedimentary									
LOC CHERT	1		1	4			6	2	14
N-L CHRT	1			1			1		3
CHALC	1								1
AGATE	1		3	4		2		1	11
SILTST	1						1		2
Igneous									
OBSID					6				6
RHYO		3		4			1		8
RHWDT	8	1	1	7			1		18
ANDE	2	2	1	7		1	1		14
ANWDT	4			8		2			14
BASALT				1		1			2
TOTAL	19	6	6	36	6	6	11	3	93

Andesite is the preferred material type (35 percent) for groundstone tools. Almost equal percentages of rhyolite (14 percent), andesitic welded tuff (14 percent), basalt (12 percent) and conglomerate (12 percent) also were used, primarily for manos and metates. Except for basalt, all materials used for groundstone tool manufacture were immediately available in the area. Few of the groundstone items were formally manufactured, most appear expedient. Fifty-eight percent of the groundstone artifacts are complete.

Of the thirty-one manos recorded, most appear to be the one-hand variety although many are only fragments. All two-hand manos recorded are fragments or exhausted. Crew members recorded eight slab and/or basin metates and one complete and one fragment of a trough metate.

One pigment grinding tool was recorded (at LA10048) and Morris collected three pigment stones of hematite and limonite during the 1968 survey.

As seen in Table 9, evidence of food processing occurred at 74 percent of the sites with groundstone tools and, within this group, almost equally on just three site types: seven artifact scatters, six pueblo sites (including small fieldhouses) and four rockshelters.

CONCLUSIONS OF THE LITHIC ARTIFACT ANALYSES

Chipped stone and groundstone artifacts from the survey provide information on the types of stone material used, types of stone tools manufactured, site function and a general chronological framework for some sites. Fourteen types of lithic material were used in the manufacture of stone tools, most of them igneous rocks. Despite this, local chert, although commonly in small nodules, is the most prevalent material, comprising more than 25 percent of the lithic sample. Bifacial tools occur

TABLE 7: Groundstone Artifacts by Site.

LA No.	Manos	Metates	Mortars	Abraders	Palette	Mineral	Total
10018	1						1
10026	1						1
10041	4						4
10042	1	2					3
10045	2						2
10049	1						1
10055	1	2			1		4
10065	3						3
10066	1						1
10068	1		3				4
10075	1	1					2
10081	1	1					2
10082	6			1			7
10083	3						3
70318	1	2					3
70319	1						1
71225	1	1					2
71226	1						1
Unkn		1		1		3	5
Total	31	10	3	2	1	3	50

* includes fragments of artifacts

TABLE 8: Groundstone Artifacts by Material Type.

Material Type	Manos	Metates	Mortars	Abraders	Palette	Minerals	Total
RHYOL	6	1		1			8
ANDES	14	4					18
RHWDT	2				1		3
ANWDT	3	3		1			7
BAS	5						5
CONGL	1	2	3				6
HEMAT						3	3
Total	31	10	3	2	1	3	50

TABLE 9: Summary of Site Functions Based on the Lithic Analysis.

SITE NO.	SITE FUNCTION	COMMENTS
LA 4900	Tool manuf/food process	Interior flakes, bifaces; basin metate; 1 hand manos
LA 4902	Tool manufacturing	Primary, tertiary flakes; 1 biface
LA 4904	Tool manufacturing	One core
LA 4905	Tool manufacturing	Secondary flake; biface
LA 4906	Tool manufacturing	Secondary, tertiary flakes; angular debris; uniface
LA 4907	Tool manufacturing	Interior flakes; tools
LA 4911	Tool manufacturing	All flake types; tools
LA 4912	Tool manufacturing	Primary flake; tools
LA 4913	Tool manufacturing	One tertiary flake
LA 4916	Tool manufacturing	All flake types; 1 biface
LA 10006	Tool manufacturing	All flake types; tools
LA 10007	Tool manufacturing	Tools; secondary flake
LA 10008	Tool manufacturing	All flake types
LA 10009	Food processing (corn)	Two hand mano
LA 10012	Heavy plant processing	One chopper below on slope
LA 10014	Tool manufacturing	All flake types; tools
LA 10017	Food processing	Flakes; groundstone
LA 10018	Tool manuf/food process	Flakes; biface; mano
LA 10019	Tool manufacturing	Flakes; tools
LA 10022	Tool manufacturing	Interior flakes; bifaces
LA 10023	Tool manuf/maintenance	Interior flakes; bifaces
LA 10026	Tool manuf/food process	All flake types; biface
LA 10027	Tool manufacturing	All flake types; tools
LA 10028	Tool manufacturing	Secondary flake; uniface
LA 10029	Tool manuf/maintenance	All flake types; bifaces; uniface; lightly smoothed stone
LA 10030	Tool manuf/maintenance	Interior flakes; bifaces
LA 10031	Tool manuf/maintenance	Interior flakes
LA 10032	Tool manuf/maintenance	Interior flakes; projectile point; biface

TABLE 9: Summary of Site Functions Based on the Lithic Analysis (continued).

SITE NO.	SITE FUNCTION	COMMENTS
LA 10033	Tool manufacturing	All flake types; bifaces
LA 10035	Tool manufacturing	Primary, tertiary flakes
LA 10036	Tool manufacturing	All flake types; biface
LA 10037	Tool manufacturing	Secondary flake
LA 10041	Tool manuf/food process	All flake types; tools; cores; groundstone
LA 10042	Tool manuf/food process	All debitage types; all tool types; groundstone
LA 10044	Tool manuf/maintenance	All debitage types; all tools except bifaces
LA 10045	Tool manuf/food process	All debitage types; all tools except bifaces; groundstone
LA 10048	Burial	Expedient paint pounding stone
LA 10049	Tool manufacturing	All flake types; uniface
LA 10051	Tool manufacturing	All flake types; various tools
LA 10052	Tool manuf/maintenance	All debitage types; all tool types
LA 10055	Tool manuf/food process	All flake types; all tool types; groundstones
LA 10056	Tool manufacturing	One primary, one tertiary flakes
LA 10057	Tool manuf/maintenance	Four tertiary flakes
LA 10058	Tool manufacturing	Secondary flake; angular debris; uniface
LA 10059	Tool manufacturing	Secondary and tertiary flakes
LA 10060	Tool manufacturing	All flake types; projectile point; bifaces
LA 10065	Tool manuf/food process	Groundstone; two secondary flakes
LA 10066	Food processing (corn)	Two hand mano
LA 10067	Food, etc. processing	Boulder with ground areas; 3 pictographs
LA 10068	Tool manuf/food process	Interior flakes; projectile point; mano; bedrock mortar
LA 10069	Tool manuf/maintenance	Interior flakes
LA 10071	Tool manufacturing	All debitage types; projectile points; bifaces
LA 10072	Tool manufacturing	Primary, interior flakes; core
LA 10073	Tool manufacturing	Primary, interior flakes; tools
LA 10074	Tool manufacturing	All debitage types; tools
LA 10075	Tool manuf/food process	All flake types; cores; groundstone

TABLE 9: Summary of Site Functions Based on the Lithic Analysis (continued).

SITE NO.	SITE FUNCTION	COMMENTS
LA 10076	Tool manufacturing	All flake types; tools
LA 10078	Tool manufacturing	One secondary, one tertiary flake
LA 10079	Tool manufacturing	Interior flakes; biface
LA 10080	Tool manufacturing	All flake types; biface; core
LA 10081	Tool manuf/food process	All flake types; tool; groundstone
LA 10082	Tool manuf/food process	All flake types; tool; numerous cores; groundstone
LA 10083	Tool manuf/food process	All debitage types; tools; groundstone
LA 10086	Tool manufacturing	Interior flakes
LA 10087	Tool manuf/maintenance	Interior flakes; tools
LA 10088	Tool manuf/maintenance	Interior flakes; projectile point
LA 10089	Tool manuf/maintenance	Interior flakes tools
LA 10090	Tool manufacturing	All flake types; projectile point; core
LA 10091	Tool manufacturing	All flake types; bifaces
LA 10092	Tool manuf/maintenance	Tertiary flakes; angular debris; biface
LA 10094	Tool manufacturing	Primary, secondary flakes; bifaces
LA 10096	Food processing	Groundstone
LA 10097	Tool manufacturing	Interior flakes; bifaces
LA 10099	Tool manuf/maintenance	All flake types; tools
LA 10100	Tool manuf/maintenance	All flake types; tools
LA 70318	Tool manuf/food process	All flake types; tools; groundstone
LA 70319	Tool manuf/food process	All debitage types; tools; groundstone
LA 70320	Tool manuf/maintenance	All flake types; tools
LA 70321	Tool manuf/maintenance	All debitage types; tools
LA 70322	Tool manufacturing	All flake types
LA 70323	Tool manuf/maintenance	Interior flakes
LA 70325	Tool manuf/food process	All flake types; tools; groundstone
LA 70326	Tool manuf/food process	All flake types; tools; groundstone

in six types: most are scrapers. Unifacial tools were used primarily for expedient cutting and scraping activities.

Projectile point typologies generally agree with ceramic dating patterns at sites where both occur. However, there is some problem with this cross dating approach for sites in this sample dating to the Late Archaic and Early Pithouse periods. This is likely the result of the wide variety of San Pedro style projectile points used during this period and the more generalized Mogollon brownwares dominating the ceramic assemblages during the same period.

Eighty-three sites in this sample yielded chipped stone remains. Debitage is the most ubiquitous chipped stone material across the sites and is indicative that at more than 75 percent of the sites tool manufacture and maintenance was a primary activity.

Groundstone tools occurred on a limited number of sites, being associated most with artifact scatters, habitation sites and rockshelters. Food processing, as reflected in the number of manos and metates in the collection, was the primary activity associated with this artifact category.

SUMMARY AND CONCLUSIONS

The archeological inventory survey of Gila Cliff Dwellings National Monument yielded information on the prehistoric occupation of the Gila forks area and added general information to the overall picture of Mogollon archeology in southwestern New Mexico.

Within the Monument, 45 archeological sites of six site type categories provide information on settlement patterns, time ranges and exploitative activities of the Mogollon people between the years A.D. 550 and 1400. Additionally, ceramic, lithic, site type and locational information on more than 100 archeological sites outside the monument augment monument information and provide a more accurate picture of prehistory in the immediate area.

A SUMMARY OF GILA FORKS PREHISTORY

Occupation earlier than A.D. 500 in the Gila forks region is possible given the late Cochise Culture San Pedro style projectile points recovered from later sites within and outside the monument, and a Cochise Culture site probably occurred at Gila Hot Springs (Honea 1963). The Gila Cliff Dwellings provide perhaps the best evidence that pre-A.D. 500 Archaic people inhabited the area and that they used the caves on a regular basis (Anderson 1986:4). However, a pure Cochise site has yet to be found in the area and confirmed by absolute dating techniques.

Sites in the Gila forks area are indicative of a solid prehistoric occupation beginning around A.D. 550 with the movement of Georgetown phase Mogollon peoples into the upper reaches of the Gila River area. Occupation during this time was not intense, with a site density of perhaps 2.2 per square mile along the major drainages. Architectural remains consist of pitstructures on the gravelly ridge tops overlooking the main drainage of the Gila River. Artifacts are light to moderate in density with Alma Plain and smaller amounts of San Francisco Red composing the ceramic types. Pitstructures appear to be round and measure up to 4 m in diameter. Sites within the monument representing this period include LA10006 (which lies primarily just outside the TJ Unit), LA10042 and perhaps the earliest component at TJ Ruin (LA54955). The origin of the people who moved in during this period is uncertain. Fitting et al. (1982:40) do not recognize any Georgetown phase sites in the Cliff-Gila area during this period but such sites do occur over the remainder of the Mogollon area, particularly in the Reserve and Mimbres Valley regions.

The San Francisco phase, which follows the Georgetown phase in both the Reserve and Mimbres Valley areas, apparently is nonexistent in the Gila forks area. Instead, occupation here appears continuous from the Georgetown phase into the subsequent Three Circle phase (A.D. 650-800). Evidence for the latter phase is not obvious within the monument sites, nor well represented at site outside the monument. Three Circle components may occur at LA10045 and TJ Ruin but only excavation data could provide the proof.

The Mangus phase has been proposed for the period between A.D. 800-1000 in the general Cliff-Gila region downstream of the Gila forks. Within the monument, only one site (TJ Ruin) has a possible Mangus phase occupation (McKenna and Bradford 1989:20-22), although Lekson ((1992) personal communication) believes it would not be obvious at this site. In the sample of sites outside the monument only two sites, LA6537 (Hammack 1966) and West Fork Ruin (Ice 1968), have Mangus phase components. This possible light Mangus phase occupation in the upper reaches of the Gila River lends support to Fitting et al. (1982:47-49) who suggest Mangus phase occupation is heavier downstream from Cliff-Gila and occurs only a short distance upstream. According to Fitting et al. (1982:50) the denser populations at this time occurred in the Cliff-Gila section of the Gila River while population declines occurred both in the San Francisco and Mimbres river valleys.

Given the above, it appears that the pattern from A.D. 550-1000 in the Gila forks area is one of limited occupation by Mogollon people who were expanding into the headwaters of the Gila River, following the main watercourses through the rugged country and locating their residences on the elevated ridge tops immediately overlooking the watered bottomlands of those drainages. Occupation was light throughout this period but the pioneers of these earlier phases opened the Gila forks area to the subsequent Mimbres phase, a period of population expansion from the south that lasted through the next century and a half.

The Mimbres phase (A.D. 1000-1150) in the Gila forks region represents the most intense phase in the area by humans at any time. In the monument sample, the number of sites representing this phase outnumber the total number of sites for all previous phases. Eight sites within the monument date to the Mimbres phase occupation, including LA10041, LA10045, LA10052, LA10055, LA10075, LA10081, TJ Ruin and LA71226. LA10053, the check dam site, may well be associated with this time period as, undoubtedly, are many of the undatable artifact scatters within the monument. However, this cannot be confirmed at this time. This pattern appears somewhat skewed within the monument sample as true representations of earlier pithouse period sites are underrepresented.

However, for the same comparison outside the monument, the general pattern still holds, although in a somewhat more even ratio. There apparently are about as many Mimbres phase sites as earlier sites of all preceding phases. The result is the same, however, in that the number of Mimbres phase sites of a 150 to 200 year period are about the same as the number of sites representing the preceding 500 year period. An interesting pattern develops when comparing site location information between the Mimbres phase sites of those of the earlier periods (essentially, pithouse sites compared with pueblo sites). Whereas the earlier pithouse sites were generally located on the north and east side of the West Fork, Mimbres phase pueblo sites tend to occur on the south and west side of the drainage and at more varied locations, both elevationally and topographically.

The expansion of Mimbres people into the Gila forks area follows the same pattern for this period seen throughout southwestern New Mexico, with the apparent exception of Fitting's et al. (1982:50-51) Gila-Cliff Valley. During this time, Mimbres influence and occupation reached its maximum areal extent, ranging from extreme southeastern Arizona to at least the Río Grande, and from the San Francisco River Valley south to northern Chihuahua. When compared with dates from sites in the Mimbres Valley, Mimbres phase sites in the Black Range and Cliff-Gila region tend to date somewhat later (Lekson 1989a:F-34-35), and this may be true of Mimbres sites in the Gila forks region as well.

TJ Ruin was the Mimbres phase center of occupation in the Gila forks area. This large site was inhabited through the Late Pithouse period and then, as typical of other areas, the inhabitants constructed the large Mimbres phase roomblocks. Numerous smaller pueblos of this age occur up and down the three forks of the Gila River. If Lekson (1989a:F-59) is correct in his interpretation of "Great Kivas" during this period, TJ Ruin and LA10045, although not isolated "Great Kivas", probably served as geographic and social centers for the numerous small sites surrounding them. An interesting note on the Mimbres phase in the Gila forks region is that, as defined at TJ Ruin (McKenna and Bradford

1989:22), although the influence of the Mimbres phase was from the south, the ceramics show heavy influence from the Cibola area through this phase and into the following phase.

The Gila Cliff Dwellings are a primary representation of the Tularosa phase. Other less spectacular sites of this period probably occur but, as yet, remain unconfirmed by ceramic study or absolute dating techniques. Whatever the case, the size of Gila Cliff Dwellings and its place in Gila forks prehistory make it the paramount site of this period. As reported by Anderson (1986a:4-5), these cliff dwellings were constructed by a group of about 8 to 10 families who suddenly migrated southward from the Reserve area in the A.D. 1270s and 1280s. The cultural material, especially the ceramic assemblage, parallels the Tularosa phase materials from the Reserve area to the north, and tree-ring dates for the dwellings confirm the time period (Bannister et al. 1970:50-51).

While Tularosa phase populations to the north of the Gila forks apparently declined, with movement out of that area to the Gila forks, in the northern end of the Black Range (Laumbach and Kirkpatrick 1983:137-138) and perhaps as far south as the Cliff-Gila valley (Cosgrove 1932:111), contemporaneous populations in the Mimbres Valley tended to increase in what LeBlanc (1977:11-12) termed the Black Mountain phase. Additionally, further south, the Animas phase populations spread over the desert areas of southwestern New Mexico in a population shift following the Reserve/Tularosa phases to the nonmountainous environs.

Gila forks connections with areas to the south after the Mimbres phase appear quite limited. Only two sites within the general region show evidence of southern ceramics: TJ Ruin and Gila Cliff Dwellings. Even here, the evidence is light for contact with the Animas phase people of extreme southwestern New Mexico and northern Chihuahua. McKenna and Bradford (1989:22) report only one sherd of possible Playas Red at TJ Ruin, while Anderson (1986a:5, 1986b:121-122) notes only a few sherds of Cloverdale Incised from "no more than one or two vessels" at Gila Cliff Dwellings. The few remaining families in the Gila forks region at this time apparently were on the northern edge of prehistoric occupation for this region. This population decline reverses after about A.D. 1350 with the appearance of Saladoan occupation primarily along the Gila River and, to a limited extent, along the Mimbres River.

Salado peoples located along the Gila River up to the Cliff-Gila Valley. Evidence of this occupation in the Gila forks area occurs only at TJ Ruin, where an apparent site reoccupation is evident in a single roomblock at the southern end of the site (McKenna and Bradford 1989:20-22). The Salado occupation (Cliff phase) ended in the Mimbres Valley by about A.D. 1450 (Nelson and LeBlanc 1986:247) and may have continued in the Upper Gila region as long. When the Salado occupation at TJ Ruin ended is, at present, anyone's guess.

APACHES IN THE GILA FORKS AREA

As stated in Chapter Four, the time of initial Apache occupation of the Mogollon Plateau is unknown. The time of area abandonment by the late prehistoric Mogollones or protohistoric Saladoans has been a matter of speculation since Bandelier trekked through the region in the 1880s. Some researchers proffer Apache movement into the area as the reason for abandonment (see Danson 1957:111-118), while others believe an occupational hiatus occurred between the two native cultures. The answer to this question is still one of the more intriguing ones of southwestern New Mexico history. Getting solid physical evidence of Apachean occupation of the area also is an attractive quest in Southwestern archeology.

Historic records beginning in the 1700s provide some information on the Apache history of the region. However, much of this cannot be corroborated by the archeological record. Whether the Apache movement into southwestern New Mexico occurred as early as the A.D. 1300s or as late as the 1600s is unanswerable as yet. What is known is that by the early 1700s an apparently fair population of such people settled along the Mimbres, Upper Gila and San Francisco rivers. Corn agriculture was an important subsistence activity for these people, undoubtedly supplemented by hunting and gathering. That these people are poorly represented in the early Spanish records may be the result of two factors: 1) they were a mountain population of probably limited numbers and were adept at being "invisible" within their terrain when necessary; and 2) the early Spanish settlers kept primarily to the Río Grande Valley and northern Chihuahua, avoiding the mountainous regions of southwestern New Mexico until at least the second half of the 1700s when military campaigns first penetrated the heartland of the Gila Apache.

Descriptions of extensive rancherías on the above river drainages show evidence of Apache occupation in the region from the mid-1700s until the late 1800s when the government eventually removed them from the area. As animosity between the Apache and Euroamerican settlers increased, the Apache became more mobile, particularly in the late 1800s. The result was that physical evidence of their rancherías and camps, which were not permanent structures to begin with, became even more ephemeral and subject to natural erosion and later alteration by Euroamerican ranching and farming activities. Today, evidence of Apache occupation is difficult to identify and consists mainly of ceramic sherds, tepee rings or perhaps rock piles from locales of known association with Apache incidents.

Evidence of Apache use in the Gila forks area is exciting. Historical records and oral tradition show a respectable Apachean use of the Gila forks region from Sands' (1957:342) description of "decaying remains of wicky-ups" built over Gila Hot Springs and French's (1927:121-122) account of his sweat bath with Apaches in a canyon adjacent to Gila Hot Springs valley, to Whitehill's description of Geronimo's winter camp near Tepee Canyon some 29 km (18 miles) due west of the monument (McFarland 1974:25). Numerous other references by ranchers, miners and the military of Apache presence in the area add to the record. Aside from the written records, the best evidence for Apache occupation in the Gila forks area comes from six sites yielding a total of 66 Apache sherds. Five of the sites are within the monument boundaries and all six are up side canyons of the Gila River drainage. As suggested in Chapter Eight, the location of these sites in hidden locations with more than one access might imply site occupation during the 1880s when pressure from the military began to a have a serious effect on Apache occupation in this region. However, the presence of Apache pottery at these sites is suggestive that they were more than just temporary hideouts.

If the supposed "Apache Burial" site is truly Apachean, it would be a unique occurrence of this culture in this area. The location of the site fits well with Geronimo's comment, in his description of his homeland, that "the rocky caverns were our burying places" (Barrett 1906:17). Geronimo may have been born in the Gila forks area although this has been questioned (Debo 1976:7-8). Mails' description of Apache burial does not shed conclusive light on this site. He states that when an Apache was buried the body was "carried...to the hills, where it was either thrown into a crevice in the rocks or placed in a shallow grave" (Mails 1974:179). He adds, "a corpse might be pushed into a cavity left by a shifting rock or the fallen stump of a tree, the body being crammed into the smallest space possible" (Mails 1974:180). This does not exactly fit with the evidence at this site as the overhang is quite roomy, open and exposed to the elements. The only remains left are several split stalks of yucca or agave bound at one end to a cross piece, forming a small platform. In 1968, Morris noted cushions of grass at either end of the platform. Doc Campbell (1991, personal communication), who showed Morris the site, believes the rocks of the crude wall were higher when he first saw it before 1968.

The size of the platform (slightly over 1 m in length) is indicative that it may have supported the body of a small child or baby. However, Mails' information corroborates neither. If a child died at or near birth, it was buried and the cradleboard damaged and then "hung in a tree or burned" (Mails 1974:59), or, he adds, that when an infant died "it was often tied in its cradleboard and hung up in a tree, a tub of water was tied near to it so that the child might drink at will" (Mails 1974:180). The relic at the "Apache Burial" site does not resemble a cradleboard except in, perhaps, basic form. The platform appears, instead, to have functioned as a platform or frame on which to place a body. The first mention of the site as an Apache burial seems to come from the 1968 survey by Don Morris who attributes its original discovery to Doc Campbell, who visited the site with Morris in 1968. Campbell, however, states that he does not know where the assignation of "Apache Burial" came from (D. Campbell, 1991 personal communication).

Russell, in his administrative history of Gila Cliff Dwellings National Monument, offers a new idea on the origin and affiliation of this site; perhaps it was the location of one of several prehistoric mummies removed during the early years (Russell 1992). Whether this site is Apache in origin may never be answered although radiometric dating of the remaining wood could clarify the difference between Morris' and Russell's theories. However, if the site is Apachean, disturbance of the few remains could be a sensitive issue to those descendants who maintain an affinity to this region and to any existing Apache remains.

EUROAMERICAN HISTORY

Euroamerican history in the Gila forks region is primarily one of late nineteenth century ranching and mining and military actions needed to protect those people from the Apache. Numerous accounts of these interactions exist in books and articles on the region but no evidence or written record brings these cultures together within the current monument boundaries. Gila Cliff Dwellings, along with the Gila Hot Springs, has been a focal point for people in the region from at least the 1870s when the Hill brothers began taking people to the ruins as a point of interest. This curiosity about prehistoric remains within the area continues into the present and will continue into the future. The historic period within the boundaries include, aside from the interpreted cliff dwellings, only remnants of campfires, some scattered trash and a few initials and dates scratched within overhangs. Disturbance of the prehistoric sites by relic hunters also is a record of this era. Further research into this period of history is needed to round out the knowledge of the region and present a more complete picture of Gila Cliff Dwellings National Monument.

RECOMMENDATIONS

The archeological survey of Gila Cliff Dwellings National Monument provided more information for discussing and interpreting the Gila forks region. This study answered some questions but raised more. With this in mind, the author makes the following recommendations for further studies. Investigations can be designed to answer a number of questions about the prehistoric cultures of the Mogollon heartland and still other questions about the historic occupation of the region. Some of the recommendations echo those posed specifically for TJ Ruin (McKenna and Bradford 1989:37-39) but are applicable to the area as a whole. Some may be combined with others for a complete study. The following recommendations are not listed in order of priority, but are, instead, offered as ideas to increase and enhance the interpretive and managerial concerns of the monument.

MONUMENT SPECIFIC

1. Remote Sensing Survey of Selected Sites Within the Monument

A systematic remote sensing survey of sites within the monument would provide additional information using nondestructive techniques. Terrestrial magnetometry or ground-penetrating radar could provide a detailed map of underground features without the expense and destruction of excavation. These techniques would be particularly valuable at TJ Ruin and the "polo field", but also would be appropriate at LA10042, LA10044 and LA10045. One of these techniques, coupled with aerial infra-red and black-and-white photography, would result in a more detailed map of these sites, showing the location of suspected buried pitstructures and other nonvisible features.

2. Conservation of Vandalized Sites/Rooms

Vandals damaged two or three rooms at TJ Ruin in past years as well as portions of LA10049, LA10055, LA10056, LA10057, LA10058, LA10059, LA10060, LA10068 and LA10069. A project designed to recover the remaining information from the damaged areas would be productive. Although damaged, it has long been proven that important information can be recovered from such sites. This program would provide for 1) retrieval and documentation of this information, which would add to the now limited knowledge of these sites, 2) the incorporation of information into any larger investigation conducted at any of these sites (particularly TJ Ruin), 3) an addition to our very limited knowledge of Apache occupation in the region, 4) backfilling and recontouring of the damaged areas, and 5) as reclaimed, would remove overt signs of previous destruction and discourage further vandalism by eliminating the obvious scars of illegal activities.

3. Limited Testing at Selected Sites

Based on information obtained in item 2 above, a plan of limited excavation at one or more of the listed sites could be designed to gather additional information to further our knowledge about particular aspects of these sites and area prehistory. This is especially true for TJ Ruin where surface information has been all but exhausted and subsurface information is needed to determine more about site chronology and occupational sequences. Limited testing at sites LA10049 and LA10058 could provide the same kind of information and perhaps answer the question of their relationship, if any, to the Tularosa occupation of the monument. Additional information recovered from Apache components would add information to an almost nonexistent base.

4. Rock Art Documentation

Within the monument boundaries, six sites have rock art, including prehistoric pictographs and more recent "historic" inscriptions. A program to record all rock art elements at all sites within the monument would benefit knowledge in two ways: it would 1) supply information on this more esoteric part of the Mogollon culture; and 2) provide baseline information on the number, condition and variety of styles and materials used for monitoring any cultural or natural damage to the rock art elements. Further, such a program could be expanded to include other sites in the Gila forks area where more substantial rock art panels exist (e.g., the interpreted rock art panel below LA10100 near Scorpion Campground and the numerous rock art sites in the vicinity of the confluence of the West and Middle forks).

5. Archival Search and Local Interviews

As expanded from the recommendation in the TJ Ruin report, a search of artifactual and paper archives is appropriate, along with interviews of local residents, regarding any oral tradition or knowledge about more recent activities and collections from sites within the monument. This information would augment our present knowledge of the monument prehistory and any acquired in the future.

6. Apache Ethnography and History

A study of Apache use and occupation of the Gila forks region could result in a better understanding of use before and during the early American acquisition of the region. Such a study would round out the interpretive program of the monument and also establish a basis for dealing with any future concerns of Native Americans regarding the monument. Such a study should expand beyond the bounds of the monument to include the general Gila forks region and, to a lesser degree, southwestern New Mexico. Interviews with members of the Warm Springs people at both Fort Sill and Mescalero are a critical part of this study.

7. History of Ranching in the Gila Forks Area

A history of the early days of ranching in the area is appropriate as an adjunct to the history of the monument. As with the history of Apaches in the area, this study would develop the interpretive base for the monument; the effect of ranching on what would become monument lands, the relationship between TJ Ranch and TJ Ruin, the limited historical artifacts within the monument and the more substantial historic remains that surround the monument (cabins, graves, etc.). Elizabeth McFarland (1974) did an admirable job on area history and provided basic information more specific to the monument and its interpretation. This work would be the basis for gathering additional information. Interviews with Mrs. McFarland would add much to this study.

8. Campbell Family History as it Relates to the Monument

Since the 1930s, Dawson Campbell and his family have been major characters in the management and evolution of the monument. Perhaps no person other than "Doc" can be so intimately associated with the recent history of the monument and its preservation. This period is very much a part of the history of the monument and critical to the future understanding and interpretation of it. A study of this history, and the evolution of tourism and conservation, is needed and should be done while the primary subjects are still in the area.

GENERAL

1. A Riverine Survey of the Larger Gila Forks Region

As described in the TJ Ruin report, such a survey would identify site clusters and any other major ruins, such as TJ Ruin, that may exist in the larger Gila forks area. The numerous small surveys conducted over the years provide a hint of site types, densities and locales along the three forks of the Gila River. However, these surveys have been quite narrow in scope and area of coverage and left large tracts of land within the river bottoms and the immediately adjoining ridge tops unsurveyed (e.g., a narrow trail or power line survey through the Heart Bar ranch would miss TJ Ruin). In addition, these surveys, as well as the additional land surveyed by Morris, are but a miniscule sample of the mountainous region situated between the Cibola and Mimbres subregions of the Mogollon. A riverine survey of Sapillo Creek, Mogollon Creek, Turkey Creek and the three forks of the Gila River, although biased in design, would result in larger coverage of this critical area and allow us to make better interpretations of prehistoric population movements, settlement patterns, trade and exchange patterns and "clarify the significance of the TJ Ruin in the extreme upper Gila region" (McKenna and Bradford 1989:38). Such information could result in a better understanding of relationships between these two major subcultures of the Mogollon and "clarify the relationships between these branches as well as define the nature and degree of interaction between them" (Traylor 1986). Additionally, the data could answer such questions as: 1) what is the extent and density of Archaic age sites in the region; 2) from which direction did the Georgetown phase people immigrate; 3) what is the density of Mangus phase sites within the larger region; 4) how does that pattern relate to the Cliff-Gila valley pattern; and 5) does the Gila forks locality exist as the only or one of many wide bottomland pockets in the mountain canyons attracting prehistoric settlement?

2. Specialized Studies on Ceramic and Lithic Materials

The identification of area clay sources and lithic source materials is needed for the Gila forks region. Petrographic analysis of ceramic artifacts and trace element analysis of lithic materials would aid in the identification of resource procurement patterns, trade and exchange patterns, and answer questions regarding the geological distribution of desirable resource materials. The question of ceramic exchange versus local production could be answered and would provide material for comparative studies outside the area. The same is true of lithic materials. A more in-depth study in the Gila forks region similar to that done by Weber (1985) in the Cliff-Gila area could provide very valuable information on local lithic material availability and procurement. Trace element analysis of the local obsidian could be compared to that from Mule Creek and other locales and provide more information on this important widely traded lithic material.

REFERENCES CITED

Accola, Richard M.
1981 Mogollon Settlement Patterns in the Middle San Francisco Drainage, West-Central New Mexico. *The Kiva* 46(3):155-68.

Adams, Karen R. and Lisa W. Huckell
1986 Plant Remains. In The Archeology of Gila Cliff Dwellings. *Western Archeological and Conservation Center Publications in Anthropology* 36. Tucson.

Adams, Stephen E.
1983 Trip Report to Gila Cliff Dwellings National Monument. Memo to Associate Regional Director dated September 2, 1983 on file at the National Park Service, Southwest Regional Office. Santa Fe.

Ailman, H. B.
1983 *Pioneering in Territorial Silver City. H.B. Ailman's Recollections of Silver City and the Southwest, 1871-1892,* edited by H.J. Lundwall, University of New Mexico Press. Albuquerque.

Anderson, Keith M.
1986a Summary. In The Archeology of Gila Cliff Dwellings, pp. 1-12. *Western Archeological and Conservation Center Publications in Anthropology* 36. Tucson.

1986b Pottery. In The Archeology of Gila Cliff Dwellings, pp. 113-129. *Western Archeological and Conservation Center Publications in Anthropology* 36. Tucson.

Anderson, K.M., G.J. Fenner, D.P. Morris, G.A. Teague and C. McKusick
1986 The Archeology of Gila Cliff Dwellings. *Western Archeological and Conservation Center Publications in Anthropology* 36. Tucson.

Anyon, Roger
1980 The Late Pithouse Period. In *An Archeological Synthesis of South-Central and Southwestern New Mexico* by Steven A. LeBlanc and Michael E. Whalen, pp. 143-204. University of New Mexico, Office of Contract Archeology. Albuquerque.

Anyon, Roger, Patricia A. Gilman and Steven A. LeBlanc
1981 A Reevaluation of the Mogollon-Mimbres Archaeological Sequence. *The Kiva* 46:4:209-225.

Anyon, Roger and Steven A. LeBlanc
1980 The Architectural Evolution of Mogollon-Mimbres Communal Structures. *The Kiva* 45(3):253-277.

1984 The Galaz Ruin. *Maxwell Museum of Anthropology Publication Series,* edited by J.J. Brody and M.L. Salvador. The University of New Mexico Press, Albuquerque.

Baker, Gayla S.
1971 The Riverside Site, Grant County, New Mexico. *Southwestern New Mexico Research Reports* 5. Department of Anthropology, Case Western Reserve University. Cleveland.

Bancroft, Hubert H.
1962 *History of Arizona and New Mexico.* Horn and Wallace. Albuquerque.

Bandelier, Adolph F.
1884 Reports by A.F. Bandelier on his Investigations in New Mexico During the Years 1883-84. Archaeological Institute of America, Fifth Annual Report of the Executive Committee.

1892 Final Report of Investigations Among the Indians of the Southwestern United States, Pt. 2. *Papers of the Archaeological Institute of America* 4. Cambridge.

Bannister, Bryant, John W. Hannah and William J. Robinson
1970 *Tree-Ring Dates From New Mexico M-N, S, Z, Southwestern New Mexico.* Laboratory of Tree-Ring Research. University of Arizona. Tucson.

Barrett, S.M.
1906 *Geronimo's Story of His Life.* Reprinted 1969 by Garrett Press, Inc. New York.

Beal, John D., and Oliver McCrary
1984 Lithic Analysis. In Anasazi Pioneers: Puebloan Occupational Dynamics in the San Juan Coal Lease, edited by J.D. Beal, pp. 309-364. *School of American Research, Contract Archaeology Program Report* 096. Santa Fe.

Bennett, Iven
1986 Warmest and Coldest Months. In *New Mexico in Maps,* edited by Jerry L. Williams (second edition), pp. 34-36. University of New Mexico Press. Albuquerque.

Berman, Mary Jane
1978 The Mesa Top Site: An Early Mogollon Village in Southeastern Arizona. *New Mexico State University Cultural Resources Management Division Report* 280. Las Cruces.

1979 *Cultural Resources Overview, Socorro Area, New Mexico.* USDA Forest Service, Southwestern Region, and Bureau of Land Management, New Mexico State Office. Albuquerque and Santa Fe.

Bluhm, Elaine A.
1957 The Sawmill Site, A Reserve Phase Village, Pine Lawn Valley, Western New Mexico. *Fieldiana: Anthropology* 47:1. Chicago.

Bornong, Bernie
1985 Gila Cliff Dwellings Trail, A Cultural Resources Survey, Wilderness Ranger District, Gila National Forest. Ms. on file at the Supervisor's Office, Gila National Forest. Silver City.

Bradford, James E.
1986 Trip Report to Gila Cliff Dwellings National Monument. Memo to Associate Regional Director dated July 23, 1986 on file at National Park Service, Southwest Regional Office. Santa Fe.

1988 Trip Report to Gila Cliff Dwellings National Monument. Memo to Associate Regional Director dated November 8, 1988 on file at National Park Service, Southwest Regional Office. Santa Fe.

1989a Trip Report to Gila Cliff Dwellings National Monument. Memo to Associate Regional Director dated May 8, 1989 on file at National Park Service, Southwest Regional Office. Santa Fe.

1989b Trip Report to Gila Cliff Dwellings National Monument. Memo to Associate Regional Director dated June 23, 1989 on file at National Park Service, Southwest Regional Office. Santa Fe.

1991 Trip Report to Gila Cliff Dwellings National Monument. Memo to Associate Regional Director dated May 23, 1991 on file at National Park Service, Southwest Regional Office. Santa Fe.

Breternitz, David A.

1966 An Appraisal of Tree-Ring Dated Pottery in the Southwest. *Anthropological Papers of the University of Arizona* 10. University of Arizona Press. Tucson.

Brody, J.J.

1977 *Mimbres Painted Pottery*. School of American Research, University of New Mexico Press. Albuquerque.

Brugge, David M.

1982 Apache and Navajo Ceramics. In Southwestern Ceramics: A Comparative Review, edited by Albert H. Schroeder. *The Arizona Archaeologist* 15.

1984 The Protohistoric Among Non-Pueblo Groups of the Southwest. In Collected Papers in Honor of Harry L. Hadlock, edited by Nancy L. Fox, pp. 169-175. *Papers of the Archaeological Society of New Mexico* 9. Albuquerque.

Bussey, Stanley D.

1972 Late Mogollon Manifestations in the Mimbres Branch, Southwestern New Mexico. Ph.D. dissertation, University of Oregon. University Microfilms. Ann Arbor.

Campbell, Dawson

nd Notes and Maps on Archeological Sites. On file at the National Park Service, Western Archeological and Conservation Center. Tucson.

1963 Report on Stabilizing a Rock Slab in Room 31, Cave 5, of the Gila Cliff Dwellings. Memorandum on file at the Western Archeological and Conservation Center, National Park Service. Tucson.

Carlson, Roy

1965 Eighteenth Century Navajo Fortresses of the Gobernador District. *University of Colorado Studies, Series in Anthropology* 10. Boulder.

Chapman, Richard C.

1982 Dating Archaeological Sites with Lithic Manufacturing Debris. In *Inventory Survey of the Lower Hidden Mountain Floodpool, Lower Rio Puerco Drainage, Central New Mexico*, edited by P.L. Eidenback, pp. 235-287. Human Systems Research, Inc. Tularosa.

Chapman, Richard, C., Cye W. Gossett and William J. Gossett
1985 Class II Cultural Resource Survey, Upper Gila Supply Study, Central Arizona Project, Volumes 1-2. Deuel and Associates. Ms. on file with the Bureau of Reclamation. Phoenix.

Chapman, Richard C. and Jeanne A. Schutt
1977 Methodology of Lithic Analysis. In *Archaeological Investigations in Cochiti Reservoir, New Mexico. Volume 2: Excavation and Analysis, 1975 Season*, edited by R.C. Chapman and J.V. Biella, pp. 83-96. Office of Contract Archeology, University of New Mexico. Albuquerque.

Christiansen, Paige
1974 The Story of Mining in New Mexico. *New Mexico Bureau of Mines and Mineral Resources Scenic Trips to the Geologic Past 12*. Socorro.

Clark, Neil M.
1948 Wilderness Family. *Saturday Evening Post* 3/27/48.

Clemons, Russell E., Paige W. Christiansen and H.L. James
1980 Southwestern New Mexico. *New Mexico Bureau of Mines and Mineral Resources Scenic Trips to the Geologic Past* 10. Socorro.

Corder, Wade
1988 Geology: Gila Cliff Dwellings National Monument. Paper on file at Gila Cliff Dwellings National Monument.

Cosgrove, C.B.
1947 Caves of the Upper Gila and Hueco Areas in New Mexico and Texas. *Papers of the Peabody Museum of American Archaeology and Ethnology,* Harvard University 24:2. Cambridge.

Cosgrove, H.S. and C. B.
1932 The Swarts Ruin. A Typical Mimbres Site in Southwestern New Mexico. Report of the Mimbres Valley Expedition Seasons of 1924-1927. *Papers of the Peabody Museum of American Archaeology and Ethnology,* Harvard University 15:1. Cambridge.

Creel, Darrell and Bradley Adams
1986 Investigation of Water Control Features at NAN-20. In The NAN Ranch Archaeology Project 1985 Interim Report by Harry J. Shafer, pp. 50-66. *Anthropology Laboratory Special Report* 7. Texas A&M University. College Station.

Cremony, John C.
1868 *Life Among the Apaches*. A. Roman & Company, New York. Reprinted 1951 for Arizona Silhouettes. Tucson.

Cress, J. P.
nd Partial Report on a Group of Mimbres Phase Rooms. Ms. on file at the Forest Supervisor's Office, Gila National Forest. Silver City.

Danson, Edward B.
1957 An Archeological Survey of West Central New Mexico and East Central Arizona. *Papers of the Peabody Museum of Archaeology and Ethnology* 44:1. Harvard University. Cambridge.

Debo, Angie
1976 *Geronimo: The Man, His Time, His Place*. University of Oklahoma Press. Norman and London.

Dick, Herbert W.
1965 Bat Cave. *School of American Research Monograph* 27. Santa Fe.

Dittert, Alfred E., Jr., James J. Hester and Frank W. Eddy
1961 An Archaeological Survey of the Navajo Reservoir District, Northwestern New Mexico. *Monographs of the School of American Research and the Museum of New Mexico* 23. Santa Fe.

Everhart, Ronald E. and Pamela A. Everhart
1970 Report on Salvage Operations, Recovery of a Human Burial, Gila Cliff Dwellings NM. Ms. on file at the National Park Service, Southwest Regional Office. Santa Fe.

Feather, Adlai, editor
1959 Colonel Don Fernando De La Concha Diary, 1788. *New Mexico Historical Review* 34:4:285-304.

Findlow, Frank J.
1979 A Catchment Analysis of Certain Prehistoric Settlements in Southwestern New Mexico. *Journal of New World Archaeology* 3:3:1-15.

Findlow, Frank J. and Marisa Bolognese
1982 A Preliminary Analysis of Prehistoric Obsidian Use Within the Mogollon Area. In *Mogollon Archaeology: Proceedings of the 1980 Mogollon Conference*, edited by P.H. Beckett and K. Silverbird, pp. 297-316. Acoma Books. Ramona, California.

Findlow, Frank J. and Suzanne P. DeAtley
1976 Prehistoric Land Use Patterns in the Animas Valley: A First Approximation. *Anthropology* UCLA 6:2:1-57.

1978 An Ecological Analysis of Animas Phase Assemblages in Southwestern New Mexico. *Journal of New World Archaeology* 2:5:6-18.

1972 Preliminary Notes on Cliff Valley Settlement Patterns. *The Artifact* 10(4): 15-30.

Fitting, James E.
1973 Four Archaeological Sites in the Big Burro Mountains of New Mexico. *Center of Anthropological Study Monograph* 1. Las Cruces.

Fitting, James E., Claudia B. Hemphill and Donald R. Abbe
1982 The Upper Gila Water Supply Study: A Class I Cultural Resources Overview. Hemphill Associates. Ms. on file at Bureau of Reclamation. Boulder City.

Forbes, Jack D.
1960 *Apache, Navaho, and Spaniard.* University of Oklahoma. Norman.

French, William
1927 *Some Recollections of a Western Ranchman.* Methuen and Co., Ltd. London.

Gilman, Patricia A.
1980 The Early Pueblo Period: Classic Mimbres. In *An Archeological Synthesis of South-Central and Southwestern New Mexico.* Edited by S.A. LeBlanc and M.E. Whalen. University of New Mexico Office of Contract Archeology. Albuquerque.

Gladwin, Winnifred and Harold S. Gladwin
1934 A Method for Designation of Cultures and Their Variations. *Medallion Papers* 15. Globe.

Goodwin, Grenville
1969 *The Social Organization of the Western Apache*. University of Arizona Press. Tucson.

Gordon, G.H.
1935 Report on Gila Cliff Dwellings National Monument. Ms. on file at the National Park Service, Western Archeological and Conservation Center. Tucson.

Gossett, Cye W.
1985 Projectile Points as Chronological Indicators. In *Class II Cultural Resource Survey, Upper Gila Supply Study, Central Arizona Project* by R.C. Chapman, C.W. Gossett and W.J. Gossett. Bureau of Reclamation. Phoenix.

Gossett, Cye W. and John D. Beal
1984 Lithic Assemblages and Site Spatial Distribution in the San Mateo Region. In The Lee Ranch Mine Project: Dimensions of Occupational Persistence, edited by J.D. Beal, pp. 283-316. *School of American Research, Contract Archaeology Program* 086. Santa Fe.

Gould, Charles N.
1937 Geological Report on Gila Cliff Dwellings National Monument, New Mexico, Inspected October 17, 1937. Ms. on file at the National Park Service, Southwest Regional Office. Santa Fe.

Graybill, Donald A.
1975 Mimbres-Mogollon Adaptations in the Gila National Forest, Mimbres District, New Mexico. *USDA Forest Service, Southwest Region Archeological Report* 9. Albuquerque.

Gunnerson, Dolores A.
1956 The Southern Athabascans: Their Arrival in the Southwest. *El Palacio* 63:346-365.

1974 *The Jicarilla Apaches: A Study in Survival*. Northern Illinois University Press. DeKalb.

Gunnerson, James H. and Dolores A. Gunnerson
1971 Apachean Culture: A Study in Unity and Diversity. In, Apachean Culture, History, and Ethnology, edited by K. H. Basso and M.E. Opler, pp. 7-27. *Anthropological Papers of the University of Arizona* 21. Tucson.

Hammack, Laurens C.
1966 Diablo Highway Salvage Archaeology. *Laboratory of Anthropology Notes* 41.

Hammack, Laurens C., Stanley D. Bussey and Ronald Ice
1966 The Cliff Highway Salvage Project. Ms. on file at the Museum of New Mexico, Laboratory of Anthropology. Santa Fe.

Hammond, George P. and Agapito Rey
1966 *The Rediscovery of New Mexico, 1580-1594*. The University of New Mexico Press. Albuquerque.

Harley, George T.
1934 The Geology and Ore Deposits of Sierra County, New Mexico. *New Mexico School of Mines Bulletin* 10. Socorro, New Mexico.

Haury, Emil W.
1936a The Mogollon Culture of Southwestern New Mexico. *Medallion Paper* 20. Globe.

1936b Some Southwestern Pottery Types: Series IV. *Medallion Paper* 19. Globe.

Hemphill, Claudia B.
1983 The Eaton Site: Late Archaic on the Upper Gila. Unpublished Master's thesis, University of Oregon. Eugene.

Henshaw, Henry W.
1879 Cliff-House and Cave on Diamond Creek, New Mexico. In, *Report Upon United States Geographical Surveys West of the One Hundredth Meridian, Vol. VII--Archaeology* by George M. Wheeler. Washington, D.C.

Herrington, S. LaVerne C.
1979 Settlement Patterns and Water Control Systems of the Mimbres Classic Phase, Grant County, New Mexico. Ph.D. dissertation, University of Texas at Austin. University Microfilms International. Ann Arbor.

1982 Water Control Systems of the Mimbres Classic Phase. In *Mogollon Archaeology: Proceedings of the 1980 Mogollon Conference*, edited by P.H. Beckett and K. Silverbird, pp. 75-90. Acoma Books. Ramona, California.

Hester, James J.
1962 Early Navajo Migrations and Acculturations in the Southwest. *Museum of New Mexico Papers in Anthropology* 6. Santa Fe.

Hibben, Frank C.
1938 A Cache of Wooden Bows From the Mogollon Mountains. *American Antiquity* 4:36-38.

Hodge, Frederick W., George P. Hammond and Agapito Rey
1945 Fray Alonso de Benavides' Revised Memorial of 1634. *Coronado Cuarto Centennial Publications* 4. University of New Mexico Press. Albuquerque.

Honea, Kenneth
1963 The Diablo Complex of the San Pedro Stage at Gila Hot Springs, New Mexico. *Museum of New Mexico Laboratory of Anthropology Notes* 284. Santa Fe.

Hough, Walter
1907 Antiquities of the Upper Gila and Salt River Valleys in Arizona and New Mexico. *Bureau of American Ethnology, Bulletin* 35. Washington, D.C.

Ice, Ronald J.
1968 West Fork Ruin. A Stratified Site Near Gila Cliff Dwellings National Monument, New Mexico. *Laboratory of Anthropology Notes* 48. Santa Fe.

1987 Trip Report to Gilà Cliff Dwellings National Monument. Memo to Associate Regional Director dated November 5, 1987 on file at National Park Service, Southwest Regional Office. Santa Fe.

Janes, Joseph B.
1981 An Archeological Survey of the Proposed Gila Center Explosives Magazine Site, Gila National Forest, New Mexico, September 1981. Report on file at the Forest Supervisor's Office, Gila National Forest. Silver City.

Janes, Joseph B. and Charles Reeves
1974 The Lagoon Archaeological Survey Site. Ms. on file at Forest Supervisor's Office, Gila National Forest. Silver City.

Janes, Joseph B. and Landon D. Smith
1975 An Archeological Survey of the Proposed Gila Center Fire Base, Gila National Forest, New Mexico. Ms. on file at Forest Supervisor's Office, Gila National Forest. Silver City.

Jett, Stephen C. and Peter B. Moyle
1986 The Exotic Origins of Fishes Depicted on Prehistoric Mimbres Pottery from New Mexico. *American Antiquity* 51:4:688-720.

Jones, Karin L. and Cherie L. Scheick
1989 A Chronological and Functional Study of Chipped Stone and Groundstone. In Archaic and Puebloan Land Use and Occupation Along the Middle Chaco River, edited by Cherie Schieck. *Southwest Archaeological Research Report Series* 181. Santa Fe.

Kayser, David
1973 The Southern Apache Agency. *El Palacio* 79(2):16-23.

Kerley, Janet and Patrick Hogan
1983 Preliminary Debitage Analysis. In *Economy and Interactions Along the Lower Chaco*, edited by P. Hogan and J.C. Winter, pp. 255-261. Office of Contract Archeology and the Maxwell Museum of Anthropology, University of New Mexico. Albuquerque.

Kessell, John L.
1971 Campaigning on the Upper Gila River, 1756. *New Mexico Historical Review* 66(2):133-160.

Kidder, Alfred V., Harriet S. Cosgrove and Cornelius B. Cosgrove
1949 The Pendleton Ruin, Hidalgo County, New Mexico. *Contributions to American Anthropology and History* 50. Carnegie Institute of Washington Publication 585. Washington, D.C.

King, Dale S.
1955 Report of Trip to Gila Cliff Dwellings National Monument. Ms. on file at the National Park Service, Western Archeological and Conservation Center. Tucson.

Kramer, John
1988 Rapelling Tower, A Cultural Resources Survey, Wilderness Ranger District, Gila National Forest. Ms. on file at the Forest Supervisor's Office, Gila National Forest. Silver City.

Kuellmer, Frederick J.
1954 Geologic section of the Black Range at Kingston, New Mexico. *State Bureau of Mines and Mineral Resources Bulletin* 33. Socorro, New Mexico.

Lange, Charles H. and Carroll L. Riley
1970 *The Southwestern Journals of Adolph F. Bandelier*, 1883-1884. University of New Mexico Press. Albuquerque.

Laumbach, Karl W.
1980 Emergency Survey and Excavation in Southwestern Mew Mexico. *Cultural Resource Management Division Report* 354, New Mexico State University, Las Cruces.

1982 Perennial Use of Late Mimbres Small House sites in the Black Range: A reflection of Extended Economic Relationships or a Radical Shift in Settlement-Subsistence Patterning? In *Mogollon Archaeology: Proceedings of the 1980 Mogollon Conference*, edited by P. H. Beckett and K. Silverbird, pp. 103-109. Acoma Books. Ramona, California.

Laumbach, Karl W. and David T. Kirkpatrick
1983 The Black Range Survey. *New Mexico State University Cultural Resources Management Division Report* 566. Las Cruces.

LeBlanc, Steven A.
1976 Mimbres Archeological Center: Preliminary Report on the Second Season of Excavation 1975. *Journal of New World Archaeology* 1:6. Los Angeles.

1977 The 1976 Field Season of the Mimbres Foundation in Southwestern New Mexico. *Journal of New World Archaeology* 2:2. Los Angeles.

1980 The Early Pithouse Period. In *An Archeological Synthesis of South-Central and Southwestern New Mexico* by Steven A. LeBlanc and Michael E. Whalen, pp. 119-141. Office of Contract Archeology, University of New Mexico. Albuquerque.

1983 *The Mimbres People*. Thames and Hudson. London.

LeBlanc, Steven A. and Ben Nelson
1976 The Salado in Southwestern New Mexico. *The Kiva* 42(1):71-79.

LeBlanc, Steven A. and Michael E. Whalen
1980 *An Archeological Synthesis of South-central and Southwestern New Mexico*. Office of Contract Archaeology. Albuquerque.

Lekson, Stephen H.
1978a Settlement Patterns in the Redrock Valley of the Gila River, New Mexico. Unpublished Master's Thesis, Department of Anthropology, Eastern New Mexico University. Portales.

1978b The Villareal Sites, Grant County, New Mexico: Documentation of the 1972 and 1973 Seasons. Ms. on file at the Laboratory of Anthropology. Santa Fe.

1984 Mimbres Settlement Size in Southwestern New Mexico. In Recent Research in Mogollon Archaeology, edited by S. Upham, F. Plog, D. Batcho, and B. Kauffman, pp. 68-74. *The University Museum Occasional Papers* 10. New Mexico State University. Las Cruces.

1989 Draft, Analysis and Statement of Significance on the Mimbres Culture in Southwestern Prehistory. Ms. on file at the New Mexico State Historic Preservation Division. Santa Fe.

1990 Mimbres Archaeology of the Upper Gila, New Mexico. *Anthropological Papers of the University of Arizona* 53. The University of Arizona Press. Tucson.

Mails, Thomas E.
1974 *The People Called Apache*. Reprinted 1981. Promontory Press. New York.

Maker, Harry J. and Leroy A. Daugherty

1986 Soils. In, *New Mexico in Maps* (second edition), edited by Jerry L. Williams, pp. 64-66. University of New Mexico Press. Albuquerque.

Maker, H. J., H. E. Dregne, V. G. Link and J. U. Anderson

1974 Soils of New Mexico. *New Mexico State University Agricultural Experiment Station, Research Report* 285. Las Cruces, New Mexico.

Mallouf, Michael

1983a Cultural Resources Clearance Investigation, Western New Mexico Telephone Co., Archeological Survey - Part 43 - 1983, Location for Placement of Telephone Microwave Tower and Access Road, Gila National Forest. University of Texas, Austin.

1983b Cultural Resources Clearance Investigation, Western New Mexico Telephone Co., Archeological Survey - Part 44 - 1983, Location for Placement of Telephone Microwave Tower and Buried Telephone Cable Site, Gila National Forest. University of Texas, Austin.

1984a Cultural Resources Clearance Investigation, Western New Mexico Telephone Co., Archeological Survey - Part 50 - 1984, Location for Placement of Buried Telephone Cable Along Forest Road 528, Gila National Forest. University of Texas, Austin.

1984b Cultural Resources Clearance Investigation, Western New Mexico Telephone Co., Archeological Survey - Part 53 - 1984, Location for Placement of Telephone Microwave Tower, Access Road, and Buried Telephone Cable, Gila National Forest. University of Texas, Austin.

1985 Cultural Resources Clearance Investigation, Western New Mexico Telephone Co., Archeological Survey - Part 57 - 1985, Location for Placement of Aerial Utility Line, Gila National Forest. University of Texas, Austin.

Martin, Paul S.

1943 The SU Site, Excavations at a Mogollon Village, Western New Mexico. Second Season 1941. *Field Museum of Natural History* 32:2.

Martin, Paul S., John B. Rinaldo and Ernst Antevs

1949 Cochise and Mogollon Sites, Pine Lawn Valley, Western New Mexico. *Fieldiana: Anthropology* 38:1.

Martin, P.S., J.B. Rinaldo, E. Bluhm, H.C. Cutler and R. Grange, Jr.

1952 Mogollon Cultural Continuity and Change, The Stratigraphic Analysis of Tularosa and Cordova Caves. *Fieldiana: Anthropology* 40.

Martin, William C.

1986 Vegetation: Riparian and Montane. In *New Mexico in Maps* edited by Jerry Williams (second edition), pp. 67-69. University of New Mexico Press. Albuquerque.

McCluney, Eugene B.

nd The Excavation at the Joyce Well Site, Hidalgo County, New Mexico. Ms. on file at The School of American Research. Santa Fe.

1962 Clanton Draw and Box Canyon. *The School of American Research Monograph* 26. Santa Fe.

McFarland, Elizabeth F.
1967 *Forever Frontier: The Gila Cliff Dwellings*. The University of New Mexico Press. Albuquerque.

1974 *Wilderness of the Gila*. The University of New Mexico Press. Albuquerque.

McKenna, James A.
1979 *Black Range Tales*. Rio Grande Press, 7th Printing. Glorieta, New Mexico.

McKenna, Peter J. and James E. Bradford
1989 TJ Ruin, Gila Cliff Dwellings National Monument, New Mexico. *Southwest Cultural Resources Center Professional Papers* 21. Santa Fe.

McKusick, Charmion
1986 Faunal Remains. In The Archeology of Gila Cliff Dwellings. *Western Archeological and Conservation Center Publications in Anthropology* 36. Tucson.

Moore, James L.
1988 Archaeological Test Excavations at the Cherry Creek Site Near Tyrone, Grant County, New Mexico. *Laboratory of Anthropology Note* 462. Santa Fe.

Morgart, John T.
1986 Trip Report to Gila Cliff Dwellings National Monument. Memo to Associate Regional Director dated November 6, 1986 on file at National Park Service, Southwest Regional Office. Santa Fe.

1987a Trip Report to Gila Cliff Dwellings National Monument. Memo to Chief, Division of Conservation dated March 16, 1987 on file at National Park Service, Southwest Regional Office. Santa Fe.

1987b Completion Report: Ruins Stabilization at Gila Cliff Dwellings National Monument, New Mexico. Fiscal Year 1987. Report on file at the National Park Service, Southwest Cultural Resources Center. Santa Fe.

Morris, Don
1968a A Preliminary Report of a Survey of Gila Cliff Dwellings and a Portion of the Gila National Forest, New Mexico. Ms. on file at the National Park Service, Southwest Regional Office. Santa Fe.

1968b Stabilization Report, Gila Cliff Dwellings. Ms. on file at the National Park Service, Western Archeological and Conservation Center. Tucson.

1968c Field Notes: Site Forms. On file at the National Park Service, Western Archeological and Conservation Center. Tucson.

1986 Area Survey. In The Archeology of Gila Cliff Dwellings. *Western Archeological and Conservation Center Publications in Anthropology* 36. Tucson.

Murray, John A.
1988 *The Gila Wilderness: A Hiking Guide*. University of New Mexico Press. Albuquerque.

Museum of New Mexico
1991 Archeological Resources Management System. Ms. on file at the Laboratory of Anthropology. Santa Fe.

Myers, Lee
1968 Military Establishments in Southwestern New Mexico: Stepping Stones to Settlement. *New Mexico Historical Review* 63(1):5-48.

Neely, James A.
1978 The Archaeology of the W.S. Ranch Site, West Central New Mexico, the 1977 Season. Paper presented at the 43rd Annual Meeting of the Society for American Archaeology. Tucson.

Nelson, Ben A. and Steven A. LeBlanc
1986 *Short-Term Sedentism in the American Southwest, The Mimbres Valley Salado*. Maxwell Museum of Anthropology and the University of New Mexico Press. Albuquerque.

Nelson, Margaret C.
1981 Chipped Stone Analysis in the Reconstruction of Prehistoric Subsistence Practices: An Example from Southwestern New Mexico. PhD dissertation. Department of Anthropology, University of California. Santa Barbara.

New Mexico Geological Society
1982 New Mexico Highway Geologic Map. Socorro.

New Mexico State Planning Office
1967 *Water Recources of New Mexico: Occurrence, Development and Use*. State Planning Office. Santa Fe.

Newton, Richard
1985 Gila Visitor Center Bridge Construction, Wilderness Ranger District, Gila National Forest. Ms. on file at Forest Supervisor's Office, Gila National Forest. Silver City.

Nightengale, Christian B.
1986a An Archeological Survey of the Forks Campground and a Proposed Borrow Area in SA Canyon, Located Southeast of the Confluence of the Middle and East Forks of the Gila River. Ms. on file at the Forest Supervisor's Office, Gila National Forest. Silver City.

1986b An Archeological Survey of Portions of Forest Service Trail #724 (Gila River Trail) and Trail #247 (Sapillo Creek Trail). Ms. on file at the Forest Supervisor's Office, Gila National Forest. Silver City.

Nordby, Larry V.
1979 A Stabilization Inspection for Gila Cliff Dwellings National Monument. Ms. on file at the National Park Service, Southwest Regional Office. Santa Fe.

1985 Trip Report to Gila Cliff Dwellings National Monument. Memo to Associate Regional Director dated April 2, 1985 on file at National Park Service, Southwest Regional Office. Santa Fe.

Nowak, Michael, and Christopher A. Jones
1985 Archeological Investigations in Southeastern Colorado. *Colorado College Publications in Archaeology* 8. Colorado Springs.

Opler, Morris E.
1937 An Outline of Chiricahua Apache Social Organization. In *Social Anthropology of North American Tribes*, edited by Fred Eggan, pp. 173-239. Chicago.

Pattie, James O.
1984 *The Personal Narrative of James O. Pattie*, edited by Timothy Flint. Originally published in 1833 by E.H. Flint. Cincinatti. Reprinted in 1984 by the University of Nebraska Press. Lincoln.

Peirce, H. Wesley
1974 Thick Evaporites in the Basin and Range Province, Arizona. *The Northern Ohio Geological Society, Inc., Fourth Symposium on Salt* 1:47-55. Cleveland.

1984 Some Late Cenozoic Basins and Basin Deposits of Southern and Western Arizona. In *Landscapes of Arizona: The Geological Story*, edited by T.L. Smiley, J.D. Nations, T.L. Pewe, and J.P. Schafer. University Press of America. Lanham, Maryland.

Ratté, J.C., D.L. Gaskill, G.P. Eaton, D.L. Peterson, R.B. Stotelmeyer and H.C. Meeves
1979 Mineral Resources of the Gila Primitive Area and Gila Wilderness, New Mexico. *Geological Survey Bulletin* 1451, Washington, D.C.

Reed, Eric K.
nd A Review of Upper Gila Prehistory. Ms. on file at Gila Cliff Dwelling National Monument.

1965 Human Prehistory in Southwestern New Mexico. In, *New Mexico Geological Society Guidebook of Southwestern New Mexico* II, edited by J.P. Fitzimmons and C. Lochman-Balk, pp. 228-229. Albuquerque.

Richert, Roland
1955a Correspondence to Emil Haury. On file at the National Park Service, Southwest Regional Office. Santa Fe.

1955b Surface Sherd Collection, Gila Cliff Dwellings. Correspondence to General Superintendent on file at the National Park Service, Southwest Regional Office. Santa Fe.

1956 Ruins Stabilization Report, Gila Cliff Dwellings National Monument, Catron County, New Mexico. Southwestern National Monuments Stabilization Unit. Ms. on file at the National Park Service, Southwest Regional Office. Santa Fe.

1967 Memorandum from Richert to Chief, Southwest Archeological Center dated November 27, 1967. On file at Gila Cliff Dwellings National Monument.

Rinaldo, John B. and Elaine A. Bluhm
1956 Late Mogollon Pottery Types of the Reserve Area. *Fieldiana: Anthropology* 36:7.

Russell, Peter
1992 Administrative History of Gila Cliff Dwellings National Monument. National Park Service, *Southwest Cultural Resources Center Professional Papers* Santa Fe.

Sandor, J.A. and P.L. Gersper
1988 Evaluation of Soil Fertility in Some Prehistoric Agricultural Terraces in New Mexico. *Agronomy Journal* 80:846-850.

Sandor, J.A., P.L. Gersper and J.W. Hawley
1986 Soils at Prehistoric Agricultural Terracing Sites in New Mexico. *Soil Science Society of America Journal* 50:166-180.

Sands, G. H.
1957 The U.S. Cavalry at the Gila River Cliff Dwellings, 1885. *El Palacio* 64:11-12, pp. 340-346.

Schaafsma, Polly
1980 *Indian Rock Art of the Southwest*. University of New Mexico Press. Albuquerque.

Schroeder, Albert H.
1962 A Study of the Apache Indians, Part IV. Ms. on file National Park Service, Southwest Regional Office. Santa Fe.

1963 Navajo and Apache Relationships West of the Rio Grande. *El Palacio* 70:3:5-23.

1974 *A Study of the Apache Indians, Parts I-III.* Garland Publishing. New York.

Schutt, Jeanne A.
1980 The Analysis of Wear Patterns Resulting from the Use of Flake Tools in Manufacturing and Processing Activities: A Preliminary Report. In *Human Adaptations in a Marginal Environment: The UII Mitigation Project*, edited by J.L. Moore and J.C. Winter, pp. 66-93. Office of Contract Archeology, University of New Mexico. Albuquerque.

Scoggins, Kenneth
1985 Letter report from Gila Forest Supervisor to State Historic Preservation Officer date June 13, 1985. On file at the Forest Supervisor's Office, Gila National Forest. Silver City.

Shafer, Harry J. and Anna J. Taylor
1986 Mimbres Mogollon Pueblo Dynamics and Ceramic Style Change. *Journal of Field Archaeology* 13:1:43-68.

Skinner, Elizabeth
1974 Similarity of Lithic Industries in the Burro Mountains and the Cliff Valley of Southwestern New Mexico. *The Artifact* 12:3:30-44.

Smith, Ralph A.
1962 Apache Plunder Trails Southward, 1831-1840. *New Mexico Historical Review* 37:1:20-42

Steen, Charlie
1942a Ruins Stabilization at Gila Cliff Dwellings National Monument, 1942. Ms. on file National Park Service, Southwest Regional Office. Santa Fe.

1942b Summary of Upper Gila Archaeology. Ms. on file Gila Cliff Dwellings National Monument.

Stieger, Patti
1985a West Fork Trail, A Cultural Resource Survey. Wilderness Ranger District, Gila National Forest. Ms. on file at Forest Supervisor's Office, Gila National Forest. Silver City.

1985b Middle Fork Trail 157.2, A Cultural Resource Survey, Wilderness District, Gila National Forest. Ms. on file at Forest Supervisor's Office, Gila National Forest. Silver City.

Stuart, David E., and Rory P. Gauthier
1981 *Prehistoric New Mexico*. New Mexico State Historic Preservation Bureau. Santa Fe.

Teague, George A.
1986 Chapter 7 - Stone Artifacts. In The Archeology of Gila Cliff Dwellings pp. 131-163. *Western Archeological And Conservation Center Publications in Anthropology* 36. National Park Service. Tucson.

Thomlinson, M. H.
1945 Forgotten Fort. *New Mexico Magazine* 23(11)

Thompson, B.H., H. James, C.N. Gould, W.H. Wirt, C.A. Richey and E.K. Reed
1937 Report on Gila Primitive Area New Mexico, September 17-26, 1937 and October 13-22, 1937. Ms. on file National Park Service, Southwest Regional Office. Santa Fe.

Thrapp, Dan L.
1974 *Victorio and the Mimbres Apaches*. University of Oklahoma Press. Norman.

Traylor, Diane
1986 National Register of Historic Places Inventory - Nomination Form: Gila Cliff Dwellings National Monument. On file National Park Service, Division of Anthropology. Santa Fe.

Tuan, Yi-Fu, Cyril E. Everard, Jerold G. Widdison and Ivan Bennett
1973 *The Climate of New Mexico*. New Mexico State Planning Office. Santa Fe.

United States Government
1907 A Proclamation, No. 781, Stat. 2162. On file at the National Park Service, Southwest Regional Office. Santa Fe.

1962 Presidential Documents, Proclamation 3467. *Federal Register* 27:77:3791.

Vivian, Gordon
1955 Trip report to Gila Cliff Dwellings. Correspondence to General Superintendent on file National Park Service, Southwest Regional Office. Santa Fe.

1956 Archeological Sites Visited at Gila Cliff Dwellings National Monument. Memo from Vivian to General Superintendent dated April 10, 1956 on file National Park Service, Southwest Regional Office. Santa Fe.

1963a Field Notes, Gila Cliff. On file at the National Park Service, Western Archeological and Conservation Center. Tucson.

1963b Work at Gila Cliff Dwellings. Memo from Vivian to Regional Archeologist. On file at the National Park Service, Western Archeological and Conservation Center. Tucson.

Vivian, Gordon and Dee Dodgen
nd Excavation and Stabilization at Gila Cliff Dwellings. Ms. on file National Park Service, Western Archeological and Conservation Center. Tucson

Wachter, Bruce
1985 Bedrock Deterioration and Rockfall Hazard at Gila Cliff Dwellings National Monument: Report of Examination Trip of September 11, 1985. On file at the National Park Service, Southwest Regional Office. Santa Fe.

Warnica, James M.
1975 Mimbres Sites on the Upper Gila River: A Preliminary Report. Ms. on file Eastern New Mexico University. Portales.

Watson, Editha L.
1927 Some New Mexico ruins. *El Palacio* 23(7-8):174-234.

1929 Caves of the Upper Gila River, New Mexico. *American Anthropologist* 31:299-306.

Watson, Dorothy
1987 *The Pinos Altos Story*. Privately printed.

Weber, Robert H.
1985 Lithic Resource Potential of the Eastern Portion of the Survey Area. In *Class II Cultural Resource Survey, Upper Gila Water Supply Study, Central Arizona Project* by R.C. Chapman, C.W. Gossett and W.J. Gossett. Bureau of Reclamation. Phoenix.

Webster, Clement L.
1891 Preliminary Notes on the Archeology of Southwestern New Mexico. *The American Naturalist* August:768-770.

1893 Among the Cliff-Dwellers. *The American Naturalist*. May:435-438.

1912a Some Burial Customs Practiced by the Ancient People of the Southwest. *The Archaeological Bulletin* 3:3:69-79.

1912b Archaeological and Ethnological Researches in Southwestern New Mexico, Part I. *The Archaeological Bulletin* 3:4:101-115.

1913a Archaeological and Ethnological Researches in Southwestern New Mexico, Part II. *The Archaeological Bulletin* 4:1:14-20.

1913b Archaeological and Ethnological Researches in Southwestern New Mexico, Part III. *The Archaeological Bulletin* 4:2:43-48.

1914a Archaeological and Ethnological Researches in Southwestern New Mexico, Part IV. *The Archaeological Bulletin* 5:2:19-25.

1914b Archaeological and Ethnological Researches in Southwestern New Mexico, Part V. *The Archaeological Bulletin* 5:3:44-46.

Wellman, Paul I.
1947 *Death on Horseback*. Seventy Years of War for the American West. J.B. Lippincott Co. Philadelphia and New York.

Whalen, Norman
1971 Cochise Culture Sites in the Central San Pedro Drainage, Arizona. Unpublished Ph.D. dissertation, University of Arizona. Tucson.

Wilcox, David R.
1981 The Entry of Athapaskans into the American Southwest: The Problem Today. In The Protohistoric Period in the North American Southwest, A.D. 1450-1700, edited by D. R. Wilcox and W. B. Masse, pp. 213-256. *Arizona State University Anthropological Research Papers* 24. Tempe.

Wilson, Benjamin D.
1934 Benjamin David Wilson's Observations on Early Days in California and New Mexico. *Historical Society of Southern California Annual Publications* 6. Los Angeles.

Winter, Joseph C.
1986 New Evidence on the Arrival of the Athabascans in the Southwest and Western High Plains. Paper presented at the 1986 Navajo Studies Conference, Albuquerque.

1988 *Stone Circles, Ancient Forts, and Other Antiquities of the Dry Cimarron Valley*. New Mexico Office of Cultural Affairs, Historic Preservation Division. Santa Fe.

Woodbury, Richard B.
1954 Prehistoric Stone Implements of Northeastern Arizona. *Peabody Museum Papers of American Archaeology and Ethnology* 24:6.

Woodrow, Henry
1989 History of McKenna Park District, Gila National Forest. In The Early Days: A Sourcebook of Southwestern Region History, Book 1, pp.186-201. *USDA Forest Service Southwestern Region Report* 7. Albuquerque.

Wylie, Henry G.
1974 An Analysis of Lithic Artifacts From the Gila National Forest Near Reserve, New Mexico and An Archeological Survey of the Reserve Land Exchanges, Gila National Forest, New Mexico. *USDA Forest Service Archeological Report* 2. Albuquerque.

APPENDIX 1

A LIST OF PLANTS FOUND IN OR NEAR GILA CLIFF DWELLINGS NATIONAL MONUMENT

A LIST OF PLANTS FOUND NEAR GILA CLIFF DWELLINGS NATIONAL MONUMENT

TREES

Common Name	Scientific Name	Comments		
Alder, Arizona	*Alnus oblongifolia*	H	***	
Alder, New Mexican	*Alnus sp.*	H		
Ash, Velvet	*Fraxinus pennsylvanicia v.*		**	
Box Elder, Inland	*Acer negundo*	H	**	
Chokecherry, Southwestern	*Prunus serotina virens*		**	AH
Cottonwood, Fremont	*Populus fremonti*		**	
Cottonwood, Lanceleaf	*Populus acuminata*		*	
Cottonwood, Narrowleaf	*Populus angustinfolia*	H	**	
Fir, Douglas	*Pseudotsuga menziesi*	H	**	
Hoptree, Narrowleaf	*Ptelea angustifolia*	H		
Juniper, Aligatorbark	*Juniperus deppeana*	H	**	
Juniper, One-seed	*Juniperus monosperma*	H	**	
Juniper, Rocky Mountain	*Juniperus scopulorum*	H	**	AH
Oak, Gambel	*Quercus gambelii*	H	**	
Oak, Gray	*Quercus grisea*	H	**	
Oak, Silverleaf	*Quercus hypoleucoides*		*	
Pine, Chihuahua	*Pinus leiophylla*		*	
Pine, Piñon	*Pinus edulis*	H	**	AH
Pine, Ponderosa	*Pinus ponderosa*	H	**	AH
Pine, Southwestern White	*Pinus strobiformis*		*	
Sycamore, Arizona	*Platanus wrighti*		***	
Walnut, Arizona	*Juhlans major*	H	**	AH
Willow	*Salix sp.*	H	**	

H Listed for the general vicinity by B. Hayward (McFarland 1967)
* Listed but not confirmed by U.S.F.S. staff
** Confirmed within Gila Forks vicinity (Anonymous nd)
*** Confirmed within monument boundaries (Anonymous nd and this survey)
AH Recovered from Gila Cliff Dwellings (Adams and Huckell 1986)

SHRUBS AND VINES

Common Name	Scientific Name	Comments		
Apache Plume	*Fallugia paradoxa*		***	
Beargrass	*Nolina Microcarpa*		*	
Buckbrush	*Ceanothus fendleri*		*	
Buckthorn, Birchleaf	*Rhamnus betuloides*	H	***	
Buffalo-Gourd	*Cucurbita foetidissima*		***	
Brickel Bush	*Brickellia sp.*		*	
Cliffrose	*Cowania stansburiana*	H	**	
Currant, Golden	*Ribes aureum*	H	***	
Gooseberry, Orange	*Ribes pinetorum*		**	
Grape, Canyon	*Vitis arizonica*	H	***	
Gromwell	*Lithospermum sp.*			AH
Groundsel, Ragwort	*Senecio multicapitatus*		***	
Honeysuckle, Arizona	*Lonicera arizonica*		*	
Locust, New Mexican	*Robinia neomexicana*	H	*	
Morning Glory, (Red Starflower)	*Ipomoea coccinea*		*	
Mountain Mahogany	*Cercocarpus brevifolius*	H	***	
Poison Ivy	*Rhus radicans*		**	
Rabbitbrush	*Chrysothamnus nauseosus*		***	
Rose, Wild	*Rosa fendleri*		***	
Silktassel, Wright's	*Garrya wrightii*		**	
Squawbush	*Rhus trilobata*		***	
Virgin's Bower, Western	*Clematis ligusticifolia*	H	**	
Virginia Creeper	*Parthenocissus vitacea*	H	***	
Wild Olive, New Mexico	*Forestiera neomexicana*	H	***	

CACTII

Cholla, Cane	*Opuntia spinosior*		*	
Hedgehog, Claret Cup	*Echinocereus triglochidiatus*		*	
Hedgehog, Fendler	*Echinocereus fendleri*		*	
Hen and Chicken Cactus	*Coryphantha vivipara*		*	
Prickly Pear, Smooth Mountain	*Opuntia compressa*		*	AH
Prickly Pear, Purple Fruited	*Opuntia phaeacantha discata*		*	
Prickly Pear, Sprawling	*Oputia phaeacantha major*		*	
Prickly Pear, Yellow	*Oputia sp.*	H		

FLOWERING PLANTS

Common Name	Scientific Name	Comments
Alfilaria	*Erodium sp.*	+
Alumroot	*Heuchera versicolor*	H
Aster, Leafybract	*Aster foliaceus*	H ***
Beebalm (Horsemint)	*Monarda menthaefolia*	H ***
Beeplant, Rocky Mountain	*Cleome serrulata*	***
Blue Bells	*Mertensia franciscana*	*
Candytuft, Wild (Pennycress)	*Thlaspi monanum fendleri*	*
Cattail	*Typha latifolia*	**
Century Plant	*Agave parryi*	*
Cinquefoil, Scarlet	*Potentilla thurberri*	H *
Columbine, Yellow	*Aquilegia chrysantha*	***
Coneflower, Cutleaf	*Rudbeckia laciniata*	H ***
Dandelion	*Agoseris sp.*	H
Datura	*Datura meteloides*	H ***
Dayflower	*Commelina diathifolia*	***
Deervetch	*Lotus wrightii*	*
Devilsclaws	*Proboscidea altheaefolia*	* AH
Dock (Wood Sorrel)	*Rumex sp.*	H * +
Fireleaf Woolywhite	*Hymenopappus filifolius*	**
Firewheel	*Gaillardia pulchella*	H **
Fleabane (Wild Daisy)	*Erigeron bellidiastrum*	H ***
Four O'clock, Many-flowered	*Mirabilis multiflora*	H ***
Four O'clock, Longneck	*Mirabilis longiflora*	***
Four O'clock, Ribbon	*Mirabilis linearis*	***
Gaura	*Gaura sp.*	***
Geranium, Richardson (Cranesbill)	*Geranium righardsonii*	H ***
Gilia, Skyrocket	*Gilia aggregata*	H *
Globemallow	*Sphaeralcea angustifolia*	H *
Goathead	*Tribulus terrestis*	*
Golden Smoke	*Corydalis aurea*	***
Groundsel	*Senecio bigelovii*	H ***
Hemlock, Water	*Cicuta douglasii*	H ***
Horehound	*Marrubium vulgare*	**
Horsenettle (Nightshade)	*Solanum elaegnifolium*	**
Horsetail	*Equisetum sp.*	*
Indian Hemp (Spreading Dogbane)	*Apocynum androsaemifolium*	**
Knotweed	*Polygonum aviculare*	**
Lambsquarters	*Chenopodium album*	*

+ some species introduced from Europe

FLOWERING PLANTS continued

Common Name	Scientific Name	Comments
Larkspur	*Delphinium sp.*	*
Lupine	*Lipinis sp.*	H **
Meadow Rue	*Thalicitrum fendleri*	H ***
Milk Vetch	*Astragalus sp.*	***
Mint, Field	*Mentha arrensis*	***
Mistletoe	*Phorodendrum sp.*	***
Mistletoe, Dwarf	*Arceuthobium sp.*	***
Monkeyflower, Yellow	*Mimulus guttatus*	H ***
Mullein (Indian Tobacco)	*Verbascum thaspus*	H ***
Nuttall's Linanthus	*Linanthus nuttalli*	***
Onion	*Allium sp.*	*
Paintbrush, Indian	*Castilleja sp.*	H ***
Penstemon, Beardlip	*Penstemon barbatus*	H ***
Penstemon, Purple	*Penstemon jamesii*	*
Peppergrass	*Lepidium sp.*	***
Pigweed	*Amaranthus sp.*	*
Poison Hemlock	*Conium maculatum*	*
Portulaca (Purslane)	*Portulaca sp.*	*
Prickly Poppy	*Argemone platyceras*	H **
Primrose, Evening	*Oenothera hookeri*	H ***
Primrose, Yellow	*Pimnla sp.*	H
Rubberweed	*Hymenoxys sp.*	*
Rush, Scouring	*Juncus sp.*	H *
Salisfy (Goatsbeard)	*Tragapogon dubius*	***
Saltbrush	*Atriplex canescens*	H
Shepard's Purse	*Capsella bursa*	**
Snake Weed	*Guitierrezia sarothrae*	***
Snapdragon Vine	*Murandya antirrhiniflora*	***
Solomonseal, Flase	*Smilicina racemosa*	H ***
Solomonseal, Southwest	*Polygoratim cobrense*	***
Sorrel, Violet	*Oxalis violetea*	***
Spearmint	*Mentha spicata*	***
Spiderflower	*Cleome lutea*	H
Spring Vetch	*Vicia satira*	***
Starflower	*Smilacina stellata*	*
Stringbean, Eggleaf	*Phaseolus ritensis*	***
Stonecrop	*Sedum sp.*	H
Sunflower	*Helianthus annuus*	H *
Stickleaf Mentzelia	*Mentzelia albacaulis*	*
Stinging Nettle	*Urtica gracilis*	**
Sweetclover, White	*Melilotus alba*	***
Sweetclover, Yellow	*Melilotus indicus*	*

FLOWERING PLANTS continued

Common Name	Scientific Name	Comments
Thistle, Common	*Sonchus oleranceus*	**
Thistle, New Mexican	*Cirsium neomexicana*	*
Tumble Mustard	*Sisymbrium sp.*	*
Verbena, Dakota	*Verbena vipinnatifida*	***
Verbena, Wright's	*Verbena wrightii*	**
Violet, Canada	*Viola canadensis*	H ***
Wallflower, Western	*Erysimum capitatum*	***
Wild Buckwheat	*Eriogonum sp.*	*
Wild Strawberry	*Fragaria bracteata*	*
Windmills, Pink	*Sisyraorium linearifilium*	***
Yarrow	*Melilotus indicus*	H ***

GRASSES

Common Name	Scientific Name	Comments	
Bottlebrush Squirreltail	*Sitanion hystrix*	PJ/PP	DP
Brome, Mountain	*Bromus carinatus*	PJ/PP	DP
Brome, Nodding	*Bromus anomalus*	PP	DP
Bull Grass	*Muhlengergia emersleyi*	PJ	DP
Fescue, Arizona	*Fescuta arizonica*	PP	DP
Gramma, Blue	*Bouteloua gradilis*	PJ/PP	DP
Junegrass	*Koeleria cristata*	PJ/PP	DP
Muhly, Longtongue	*Muhlenbergia longiligula*	PJ	DP
Muhly, Mountain	*Muhlenbergia montana*	PJ/PP	DP
Muhly, New Mexico	*Muhlenbergia sp.*	PJ	DP
Mutton Bluegrass	*Poa fendleriana*	PP	DP
Piñon Rice Grass	*Oryzopsis hymenoides*	PJ	DP
Wolftail	*Lycurus phleoides*	PJ	DP

PJ occurs in piñon-juniper woodland
PP occurs in ponderosa pine forest
DP confirmed by Dave Peters, Biologist, Gila Wilderness District

APPENDIX 2

FIELD RECORDING FORMS USED FOR THIS PROJECT

(SEE APPENDIX 3 FOR LITHIC FIELD ANALYSIS FORMS)

ARCHEOLOGICAL INVENTORY SITE FORM

Division of Anthropology
Branch of Cultural Resources Management
National Park Service

Site No.:_______________ Field No.:__________ Site Name:_______________
Project:___________________________ Recorders:_____________________
Comparative Site Nos.:___________________________________ Date:__________
Previous Documentation/Research:____
____
____
____

Brief Description of Site Setting:_______________________________________
____
____
____

Cultural Affiliation:	Culture	Subculture	App. Dates
Prehistoric	______________	______________	__________
	______________	______________	__________
Historic	______________	______________	__________

Total Number of Components:__________

SITE LOCATION

A. Map Locations:
State____ County___________ USGS Quad__________________; T_____, R_____;
Section_____, _____ 1/4 of _____ 1/4 of _____ 1/4; Survey Unit____________
UTM Coordinates: Zone_____Easting_____________ Northing_______________
Aerial Reference________________________ Other_________________________

B. Reference Points:
Major Landforms Visible From Site (name, type, distance, direction)____
____
____
____

C. Access:
Nearest Highway (name, number, distance, direction)__________________
Nearest Road/Trail (name, number, distance, direction)_______________
Description of Terrain From Nearest Road to Site_____________________
____
____
____
____

Site No.____________ Survey Unit____________ Recorder____________ Date____
___

D. Description of Site Location____
____
____
____
____

ENVIRONMENTAL DATA

A. Elevation (ft)__________ Exposure____________ Slope (degree/dir)_______
___

B. Water Resources
Drainage: Primary____________________
Secondary____________________
Tertiary_______________________
Quaternary_______________________

Drainage in Immediate Vicinity of Site__________________________________
____

Available Water (check all known water sources within a 2 mile radius).

River____ Seep____ Spring____ Bedrock Catchment___

Intermittent Wash____ Arroyo____ Intermittent Waterfall____

Other____(specify)____

Nearest Potential Water Sources (name, type, distance, direction)_______
____

Nearest Permanent Water Sources (name, type, distance, direction)_______
____

C. Biotic Communities
Vegetation Classification:
Desert Scrub____ Grassland____ Open Woodland____ Closed Woodland___

Riparian____ Heavily Disturbed____ Cliff Side____ Tundra____

Predominate Vegetation at Site______________________________________
____

Other Vegetation at Site____
____

Evidence For Disturbance of Biotic Communities__________________________
____

Site No.__________ Survey Unit___________ Recorder____________ Date________

D. Geology

Surface Material: Alluvial____ Colluvial_____ Talus____ Aeolian___ Residual____ Eroding______ Bedrock Outcrop_____

Surface Rock Unit: Sandstone____ Limestone____ Basalt____ Granite____ Schist_____ Conglomerate____ Clay/Shale____ Cinder____ Rock/Cobble____ Boulder_____ Other____(specify)__________

Substrate: Bedrock____ Boulder/Cobble____ Gravel____ Sand____ Clay____ Other____(specify)______________________________

Soils____

____

____

____

E. Topography

Land Classification Units:

Arroyo/Wash____	Dune____	Playa____
Base of Cliff____	Flood Plain_____	Ridge____
Base of Talus____	Foothill____	Saddle____
Bench____	Hill Top____	Slope____
Blowout____	Low Rise____	Terrace____
Canyon Rim__	Mesa Top____	Valley Bottom____
Cave/Shelter____	Mountain____	Other____(specify)
Cliff/Scarp____	Open Canyon Floor____	__________________
Constricted Canyon____	Plain/Flat____	__________________

Description of Immediate Topographic Setting______________________________

____

____

____

F. Overall Landscape Description and Analysis (relate biotic, geologic, and topographic characteristics to resource potential, i.e. land use and procurement strategies)____

____

____

____

____

____

____

____

____

____

Site No.__________ Survey Unit_________ Recorder____________ Date__________

SITE DESCRIPTION

A. Prehistoric Site
Surface Structures:

No. of Structures____ No. of Rooms Visible____ Site Dimensions__________

Structure Type:
Single-room Field Structure____ Small Unit Pueblo (3-8 rooms)____

Multi-room Field Structure_____ Large Unit Pueblo (9-25 rooms)___

Farmstead____ Core Village (> 25 rooms)___
Granary/Storage Room(s)____ Ceremonial Complex____
Water Catchment____ Unidentified Structures____
Other____ (specify)_____________ Shape of Structure ________________
Average Room Size_______________ Average Present Wall Height___________

Architectural Elements:
Plaza____ Courtyard____ Covered Passageways____ Doorways____
Defensive Features____ Storage/Grinding Bins____ Wingwalls_____
Kiva____ Community Room____ Streets, trails, stairways_____
Open-air Features____ Retaining Walls____ Mounded Berms_____
Cleared Areas____ Multiple Story Structures____ Alignment(s)____
Masonry____ Other____(specify)_______________________________________

Sub-surface Structures:
No. of Depressions Visible________ No. of Structures Estimated_________
Average Depth__________ Average Size__________ General Shape___________
Inferred Function - Habitational____ Storage____ Burial____
Mealing Bin____ Ceremonial____ Other____________

Associated Site Features (include number of each):
Alignment____ Firepit/Hearth____ Slab-lined Cist____
Bedrock Feature____ Mounded Midden____ *Trash Area ___
Burial____ Quarry____ Terrace____
Check Dam____ Rock Art_____ Wall____
Diversion Wall____ Rock Pile_____ Other:______________
____

B. Non-structural Prehistoric Sites
Lithic Scatter____ Ceramic Scatter____ Agricultural Field System ___
Other____(specify)____

* Trash Area(s) Size____

Site No.__________ Survey Unit__________ Recorder____________ Date_________

C. Historic Site
Structures: House____ Barn____ Shed____ Hogan____ Sweatlodge____
Other____(specify)____

Shape____________ Size_________________ Entrance Orientation__________

Masonry_____ Brick____ Wood____ Upright Slabs____ Other________________

Features: Ash Pile____ Wood Chop Area____ Dam/Reservoir____ Pen___

Trash Dump/Pile____ Foundations____ Other:_________________

____

D. Artifact Assemblage
No. of Artifacts: <10____, 10-25____, 26-100____, 101-500____, >500____
Ceramics____
____
____

Lithic Flaked Tools____
____
____

Lithic Debitage____
____
____

Ground Stone____
____

Historical Materials____
____
____

Other Materials____
____
____

E. Inferred Activities
Habitation____ Agricultural____ Food Gathering/Processing____
Seasonal Use____ Tool Manufacture____ Ceremonial/Integrative____
Quarry____ Rock Art____ Other:_________________________________

F. Summary Site Description____
____
____
____
____
____
____
____
____

Site No.__________ Survey Unit__________ Recorder___________ Date__________

RESOURCE MANAGEMENT

A. Site Disturbance
Categories (L = Light, M = Moderate, H = Heavy):
Rodents____ Domestic Animals____ Deflation____ Water Erosion____
General Weathering____ Vehicular Traffic____ Heavy Equipment____
Vandalism____ Pothunting____ Other:________________________________

B. Mitigation Recommendations
Avoid____ Protect____ Research Program____ Stabilization____
Discussion____
____
____

C. Site Significance
Research and Interpretive Potential_____________________________________
____
____
____

PHOTOGRAPHS

Photograph Record Sheet: B/W, Page #___; Color, Page #___; Video Tape #____

Black-and-White Photographs

Photographer	Roll No.	Exp. No.	Description

Color Photographs

Photographer	Roll No.	Exp. No.	Description

SUPPLEMENTAL FORMS AND MAPS

Check Those Attached:

Site Map____ Ceramic Form____ Debitage Form____ Stone Tool Form____
Supplementary Artifact Data Form____ Surface Collection Map Form____
Rock Art Panel Form____ Rock Art Drawings____ Stabilization Assessment____

CERAMIC DATA SHEET

PAINTED WARES

Recorder ____________________ Date ___________ Field # __________ Lab # _______

	Sample Unit				
Radius:					
Type					
La Plata B/W					
White Mound B/W					
Kiatuthlana/Red Mesa B/W					
Puerco/Escavada B/W					
Reserve B/W					
Tularosa B/W					
Puerco B/W					
Wingate B/W					
St. Johns Poly.					
Heshotauthla Polychrome					
Springerville Polychrome					

Comments on reverse

CERAMIC DATA SHEET Page ____ of _____

UTILITY WARES

Recorder ____________________ Date ___________ Field # ________ Lab # _________

Unit #					
Unit Radii					
Alma Plain					
Alma Textured					
Alma Neck Banded					
? brn body					
Lino Gray					
Kana-a Gray					
? gray body					
San Fran. Red					
Lino Fugit. Red					
Reserve Pln Corr.					
Reserve Punched Corrugated					
Patterned Corr.					
? brn corr. body					
? gray corr. body					
Three Circle Corrugated					

For corrugated wares: note number of vertical (_____) and flared (_____) rims

ISOLATED ARTIFACT FORM

Institution No./Name/Project____

UTM: Zone___ ___ E ____ ____ ____ ____ ____ ___ N___ ___ ___ ___ ___ ___ ___

Legal Description _____ 1/4 ___ 1/4 ___ 1/4 T ___ N/S R ___ E/W Sec. _______

Elevation (in feet) ________________ County ______________ State ____________

*Map Reference: ____ State ____________

Topographic Setting:

____ arroyo/wash	____ flood plain	____ plain/flat
____ base of cliff	____ valley bottom	____ playa
____ bench	____ hill top	____ ridge
____ blowout	____ slope	____ saddle
____ canyon rim	____ low rise	____ base of talus slope
____ cave	____ mesa	____ terrace
____ cliff/scarp	____ mountain	____ other (specify)___
____ constricted canyon	____ mt. front/foothill	________________________
____ dune	____ open canyon floor	________________________

____

____

Local Vegetation____

____

Ecological Zone: forest____ woodland____ scrubland____ grassland____
desertscrub____ marshland____ other (sepcify)____________

Cultural Data:
Chipped stone
type______________________________ Material type______________________
Describe (% cortex, modified, unmodified, platform, angular debris, primary, secondary, tertiary, etc.)

____

____

____

____

____

____

____

*Form must be accompanied by photocopy portion of USGS map showing T. R., scale quad name, and location of isolated artifact.

Ground stone (describe)____
____

Ceramics
Type (if known)____
Describe (paint, slip, temper, paste, vessel form, rim, etc.)____________
____
____
____
____
____

Historic (older than 50 years)____
____
____
____

Other____
____
____

Sketch (if applicable):

Cultural Affiliation______________________________ Best date______________
Artifact collected? _____yes ______no
Are there other isolated artifacts, features, or sites close by?______________
LA or Field Identification # ____

Published Reference: Date______________ Institution______________________
Author and Title____

Field Recorder____ Date______________

APPENDIX 3

LITHIC ANALYSIS GUIDELINES, GLOSSARY AND ANALYSIS FORMS

James M. Rancier

FIELD ANALYSIS OF LITHIC ARTIFACTS DURING 1988-89 GILA CLIFF DWELLINGS NATIONAL MONUMENT ARCHEOLOGICAL SURVEY PROJECT NEW MEXICO

James M. Rancier

November 1988

National Park Service
Division of Anthropology
Branch of Cultural Resources Management
Santa Fe, New Mexico

INTRODUCTION

From September 6-29, 1988, the Division of Anthropology, Branch of Cultural Resources Management of the National Park Service (NPS), Southwest Regional Office, Santa Fe, New Mexico conducted an archeological inventory survey at Gila Cliff Dwellings National Monument. During that period, the division surveyed most of the monument area. The objectives of the survey were to identify all cultural resources located within the monument and to update previously investigated site records.

REPORT OBJECTIVES

The objectives of this report are to explain the field methodology used during the survey, explain the field forms and provide the glossary of terminology used in the field analysis of lithic artifacts found during the survey.

FIELD METHODOLOGY

As a general rule, light density or light density intrasite concentrations of lithic artifacts were not numerically sampled during field analysis. In many cases, small sites or intrasite concentrations with approximately 50 lithic artifacts were analyzed completely. Large sites or sites with a number of high count lithic artifact concentrations were sampled. When practical, each sample unit in a high density site or intrasite concentration would contain approximately 50 lithic artifacts. If crew members located a complex site, a sample of the intrasite components was analyzed based on available time for lithic analysis as a part of the recording of the total site. Assumably, complex sites receive more in-depth field recording after review of the survey and site evaluations.

When crew members needed to sample lithic artifacts on a site, they chose areas associated with high density artifact concentrations, concentrations associated with features or structures, and/or concentrations associated with diagnostic artifacts for analysis. Time limits for recording sites determined the number of lithic analysis sample units completed. In all cases where sampling of the artifact assemblage was needed, 100 percent of the lithic artifacts within each sample unit were analyzed. Sample area size and the orientation of square or rectangular units were determined by artifact density and physical location in an attempt to approach 50 artifacts per sample unit. Crew members noted the location of each sample unit on the site map and the sample unit dimensions and orientation for that area on the lithic analysis forms. Orientation for each sample unit was on a north-south or east-west axis whenever possible. The location of collected artifacts was plotted on the site map.

Use-wear analysis of the artifacts was limited to unaided eye identification only. Therefore, use-wear is undoubtedly underrepresented for this analysis.

FIELD RECORDING FORMS

Crew members used a newly designed set of lithic analysis forms previously used at Navajo National Monument in June 1988. The form design accommodates a number of recorded variables on each sheet. Recording in a relatively short time period is possible, making the form compatible with field conditions and associated time constraints. Two forms have a simple checklist for data recording, and additional attributes can be added. Although the number of recorded variables and monitored attributes may not be comparable to some laboratory analyses, these forms and the field procedures on this project probably are as comprehensive as most in-field lithic analyses in use today. Data recorded on these forms shows general trends in the assemblages relative to intersite, intrasite, activity differences and, if the number of sites and related activities recorded during the project is broad and representative enough for developing a classification system, diachronic/synchronic identifications. Sets of variables from the field analysis possibly useful in dealing with cultural trends can be chosen for post-field analysis. The classification of attributes recorded on the forms can provide a large range of types and measurements for use in various combinations beyond standard report analysis, if researchers wish to manipulate the data. Outlined below is a discussion of the forms, field form use, and terminology definition applied to recording sites during this project. Samples of these forms are attached for reference.

STONE DEBITAGE FORM

The header nomenclature for this form has self-explanatory entry requirements. "Sample Size" refers to the percentage of artifacts analyzed within the sample unit. "Sample Dimension" is the size of the unit sampled or the entire site if that was the sample unit. "Sample Location" is the numerical or alpha designation for the assigned location of an individual sample unit if that unit is not inclusive of the entire site. This designation corresponds to a specific location identified on-site.

Material Types - These boxes are for identifying the lithic material of which the artifact is made. The names of the material types are recorded in a box as required.

Decortication/Primary - This category refers to a flake detached from a core with 90 percent or more cortex on its dorsal surface with no modification by retouch or use. If a flake is broken or modified by use, it is recorded on the specific line for that category, depending on flake type. No flake was recorded twice. This is true for utilized secondary and tertiary flakes as well. Important to note is that broken flakes, angular debris and heat shatter were not measured during the analysis.

Utilized - This category is for recording expedient flake tool forms modified exclusively through use of an otherwise unmodified flake. Examples of such modification include step fractures or attrition on the working edges of the artifact.

Secondary - Refers to a flake that has less than 89 percent cortex on its dorsal surface and was not produced through bifacial reduction processes.

Tertiary - Refers to a flake with no cortex on its dorsal surface; however, it may have a cortical platform.

Biface Thinning - This flake category is for all forms and types of biface reduction flakes. "Other Biface Flk" was not used during this analysis.

Bipolar - A technique whereby the toolmaker rested the core or lithic piece on an anvil and struck with a percussor.

Unknown Flk - This category was not used during this analysis.

Angular Debris - This category included fragments of lithic material left over from reduction activities but without attributes that would allow classification in the above categories.

Heat Shatter - Lithic material recorded in this category included angular fragments produced by thermal shock with such attributes as crazing, discoloration, potlids or variable textures within a singular specimen.

Other - This category added flexibility to the analysis in that debitage or lithic debris not fitting into preceding categories was entered under this section.

Length - In this section, measurements of the length of complete flakes and longitudinally split flakes were entered into ordinal classification categories. Flakes missing the proximal and/or distal portions were not measured during this analysis.

Utilized - This category (including "Stepped", "Attrition", etc.) was for wear type observed on utilized flakes which can infer function or use patterns.

Platform Preparation - The type of platforms found on flakes were recorded in this section of the form. The category of "Ground" was recorded as a concurrent platform treatment type. For example, a "Flaked" platform that also was ground was recorded under both "Flaked" and "Ground".

STONE TOOL FORM

This form was used for recording formal stone tools and artifacts, including both flaked and groundstone artifacts. The header nomenclature is the same as for the Stone Debitage Form. The blank lines following each category were filled in as required to further explain or describe the recorded artifact.

SUPPLEMENTARY ARTIFACT DATA FORM

This form was for further describing and illustrating representative artifacts found in the lithic assemblage. Scaled or outline drawings and sketches of the artifacts are made on these forms, and supplementary data, such as dimensions, breakage and wear patterns, were entered here.

GLOSSARY

This glossary only pertains to the lithic analysis used during this survey and does not represent any attempt to standardize lithic technology for future investigations.

Abrader: Any stone used to reduce another stone or substance by means of a rubbing or grinding motion that is generally inclusive or a mealing function.

Agate: See Chalcedony.

Andesite: A fine grained extrusive volcanic rock gray to black or reddish to purplish in color, and intermediate in silica content between basalt and rhyolite.

Angular Debris: Fragments of lithic material that are, or appear to be, the result of lithic reduction activities by cultural means and that lack attributes that would place them in a more discrete artifact category. Angular debris lacks an identifiable ventral or dorsal surface.

Attrition: A category of wear pattern where minute lunate fragments of the working edge of a tool are broken away; the resulting protrusions along the working edge are rounded during artifact use. A reciprocal or sawing action may produce the pattern.

Basalt: A fine grained to glassy extrusive volcanic rock that normally occurs in a gray to black or sometimes reddish color range. It contains less silica than andesite or rhyolite.

Base: The proximal portion of a lithic artifact.

Bidirectional Core: A core that results from the removal of flakes from two, normally opposing, directions. A bifacial core is a specialized version of this core.

Biface: A flaked stone artifact modified on two faces by flake removal. Bifacially flaked projectile points, preforms and drills are examples of thin and refined types of bifaces. "Blanks" are intermediate in refinement and "roughouts" are comparatively crude examples. A bifacial core is a specialized core form. A biface at any stage of manufacture may function as a tool. Thus, without microscopic verification of wear patterns to indicate that a biface was indeed used as a knife, this analysis did not arbitrarily label all bifaces "knives".

Biface Reduction/Thinning Flakes: These flakes result from bifacial core or more refined biface reduction. They usually have flaked or flaked/prepared platforms, reduced or dispersed bulbs of percussion, more acute platform angles and perhaps lipping at the ventral/platform area conjunction. The flake width-to-thickness ratio may be considered. If the flake was a questionable "biface flake", it was placed in the tertiary category.

Bifacial Core: A specialized core produced by removal of flakes from the entire perimeter and both faces of the artifact, commonly resulting in a lenticular crosssection.

Bipolar Core: This type of core is produced when the lithic material being reduced is placed on an anvil before being struck with another object. Bipolar cores are distinguishable from bipolar flakes in that they normally display the reverse traits present on the flakes. These cores have no positive bulbs of percussion and, in many attributes, they exhibit the mirror image of the bipolar flakes. Bipolar technology is a relatively common method of core reduction when source materials are small and not easily hand-held, especially during initial fracturing of the raw material.

Bipolar Flake: Debitage detached from a bipolar core may have more than one ventral surface, orange peel shape, crushed platforms, sheared cones or bulbs of percussion, and, on rare occasions, opposing platforms or bulbs of percussion on the ventral surface(s). Various combinations of these attributes were considered in identification of the technique and resulting debitage. When in doubt, the artifact was placed in an appropriate preceding category.

Blank: A bifacial stage in the manufacture of flaked stone projectile points which is more crude and less refined than a preform or the intended final product, but more refined than a "roughout". It may or may not display the final form of the intended artifact.

Burin: A specially modified flake or biface fragment thought to have been used for incising or engraving various materials.

Chalcedony: A translucent to transparent cryptocrystalline form of chert (the opposite is true by some definitions) ranging from smooth to glassy in texture. Agate is a banded form and moss agate is a form with dendritic inclusions. Chalcedonies can grade into cherts or quartzites. The local chalcedony is translucent, sometimes almost as transparent as glass and cryptocrystalline in structure. Heat altered chert may be confused here and, in fact, was found to have been placed in this category during this analysis. Local agate is the banded or swirling equivalent of chert and chalcedony. The color is primarily white.

Chert: An opaque to translucent cryptocrystalline lithic material that is relatively smooth to greasy in texture and may appear grainy in some specimens. It can grade into quartzite and chalcedony. The local chert is grainy and not glassy/transparent; the chert is translucent.

Chopper: An artifact manufactured from a core or large flake, generally identified as a hand-held tool used to hack or cut through coarse materials.

Cortex Platform: A platform created by the natural weather rind (cortex) of a lithic material.

Crushed Platform: A platform destroyed during the flake detachment process. Sometimes enough of the flake remains to measure the length of the artifact providing the distal end of the flake is present.

Drill: Commonly a bifacially flaked stone artifact used to drill holes in a variety of materials. These may have been hafted or hand-held.

Flake Core: Most commonly, these cores appear as large flakes detached from another core from which several smaller flakes have been removed.

Flaked Platform: A platform on a flake formed by the removal of two or more flakes. A flaked platform (or any other platform) can be prepared further by applying such techniques as grinding and/or stepping of the dorsal/platform junction area.

Granite: A generally light-colored coarse-grained igneous rock composed primarily of alkalic plagioclase with possible minor amounts of muscovite, biotite or hornblende.

Graver: A unifacially or bifacially flaked stone tool believed to have been used to incise or perforate a variety of materials.

Hammerstone: A river cobble, flaked core or flake tool used for battering and/or pounding and/or flint knapping.

Heat Shatter: Angular fragments of lithic material produced by thermal shock. Heat shatter can be distinguished from "angular debris" by the presence of such attributes as crazing, color change, potlids and variable textures (from waxy to granular). Angular debris and heat shatter result from different natural or cultural processes and were separated in analyses.

Ignimbrite: See Welded Tuff.

Jasper: A form of chert that often has banding of dendritic inclusions.

Mano: A hand stone used with a metate to grind foodstuffs and/or minerals. These artifacts were sometimes multi-functional and used, for example, for pounding.

Manuport: An unmodified stone apparently carried to a site by cultural means. A manuport is a geologically out of place stone.

Metate: The basal stone component of the mano/metate combination for grinding foodstuffs and/or minerals.

Missing Platform: A flake not retaining its platform after detachment. Flakes lacking platforms were not measured during this analysis.

Multidirectional Cores: Cores distinguishable by flake scars showing detachment of flakes from three or more different directions.

Obsidian: An extrusive volcanic rock formed of natural glass.

Primary/Decortication Flake: A flake with at least a 90 percent dorsal surface cortex.

Projectile Point: An artifact designed and manufactured to be hafted and used as the tip of a dart, arrow or spear shaft. In many cases, a projectile point probably served as a multi-functional tool. The design can be unique to a specific culture or time period, which archeologists often use to establish a temporal framework for periceramic or aceramic glass.

Quartzite: A granular metamorphic rock composed primarily of quartz.

Rhyolite: A tan or buff to light gray coarse to fine-grained textured rock that may show flow structure. Usually "glassy" enough to show concoidal fracture, especially in finer materials.

Rhyolitic Welded Tuff: See Welded Tuff.

Secondary Flake: A flake with 89 percent cortex on its dorsal surface not produced through bifacial reduction processes.

Tested Core: A core or cobble with from one to three flakes totally removed. Assumably, the stone was being tested for workability by the flint knapper.

Siltstone: A very fine-grained consolidated rock primarily composed of silt grade particles. In this analysis, the "red siltstone" may be a welded tuff that is very fine-grained and well sorted.

Single Platform: A platform created by the removal of one flake. This type of platform also is known as a simple or facet platform.

Tertiary Flake: A flake with no dorsal surface cortex. Single and single/prepared platforms are most commonly associated with this flake type, although, as with decortication and secondary flakes, cortical platforms may occur. In this analysis, this category excluded biface reduction flakes when separable. Biface reduction flakes missing platforms were placed in this category to avoid speculation.

Welded Tuff: A pyroclastic rock in which the detrital particles have been fused by heat. The fusion can be partial or range into a glassy state. Well-fused tuff is, in many cases, difficult to distinguish from some rhyolites and andesites. One form of welded tuff called ignimbrite can be difficult to distinguish from glassy basalts or obsidian. In this study, welded tuff showed rhyolite or andesite colors, detrital grains, and banding or distorted flow structure. It approached the glassiness of opaque obsidian or a good glassy basalt.

STONE DEBITAGE FORM

Park/Project ______________________________ Page ______ of ______

Site# ____________ Temporary# ____________ Sample Location ____________

Sample Dimension ____________ ___ Sample Size(%) ________ Collections ____________

Recorders(s) ______________________ Date ____________

	MATERIAL TYPE							
Decortication/Primary								
Broken								
Utilized								
Secondary								
Broken								
Utilized								
Tertiary								
Broken								
Utilized								
Biface Thinning								
Other Biface Flk								
Other Biface Flk								
Broken								
Utilized								
Bipolar Flake/w Cortex								
Bipolar, No Cortex								
Broken								
Utilized								
Unknown Flk Frag/Cortex								
" " " No/Cortex								
Angular Debris								
Heat Shatter								
Other								

Length: <.5 ________ <1 ________ <2 ________ <4 ________ >4 ________ cm

Utilized: Stepped _____ Attrition _____ Other _____ Other _____

Platform: Cortex ________ Single ________ Single/Prepared ________
Flaked ________ Flaked/Prepared ________ Crushed ________ Missing ________
Other ________ Other ________ Ground Final Treatment

STONE TOOL FORM

Park/Project____ Page_____ of_____

Site#_______________ Temporary#_____________ Sample Location____________

Sample Dimension____________ Sample Size(%)__________ Collections_________

Recorder(s)____ Date__________

		MATERIAL TYPE							
Projectile Point									
Biface									
Uniface									
Core									
Other									
Mano									
Metate									
Pestle									
Mortar									
Abrader									
Other									

Comments

SUPPLEMENTARY ARTIFACT DATA FORM

Park/Project____ Page______of______

Site No._______ Temporary No._______ Sample Location______________

Sample Dimension________ Sample Size(%)_____ Collected____ FS#___

Recorder(s)_____________________________________ Date_____________

Photograph(s): B/W Roll___, Exp.(s)___; Color Roll___, Exp.(s)____

COMMENTS and DRAWINGS:

APPENDIX 4

SUMMARY SITE INFORMATION FROM GILA CLIFF DWELLINGS NATIONAL MONUMENT

SUMMARY SITE INFORMATION FROM GILA CLIFF DWELLINGS NATIONAL MONUMENT

LA NO.	SITE TYPE	DESCRIPTION	ARTIFACTS	DATES
4913	rockshelter	a very small alcove within an isolated outcrop of andesite; wall base in front	chert flake; corrugated sherd	unknown
10006	pithouse	large ridge top village of 16+ pitstructures.	lithic reduction debris; Mogollon plainwares, Mimbres boldface sherds	550-1150
10041	pueblo	4-room linear pueblo in canyon bottom	lithic reduction flakes; Mogollon plainwares, Mimbres & Tularosa B/W	550-1250
10042	pithouse	2+ pitstructures on open ridge top with trash area and extensive artifact scatter	lithic reduction debris; Mogollon plainware sherds	550-1150
10044	pithouse	1 large pitstructure on level bench above floodplain	lithic reduction debris; Mogollon plainwares, Mimbres WW, Mimbres & Reserve B/W	550-1200
10045	pithouse/ pueblo	14-room pueblo with 2-3 very large pitstructures on a high bench above the river	lithic reduction debris; Mogollon plainwares, Mimbres WW, Mimbres B/W, Mimbres Boldface, & Cibola WW	550-1150
10046	rockshelter	shallow overhang with ceiling blackening	none	unknown
10047	granary	shallow, sloping overhang with masonry wall remnant	none	unknown
10048	burial	small overhang with wooden platform	yucca stalk platform and hematite-stained cobble	1600-1900?

10049	pueblo	1-room masonry structure within long, narrow rock-shelter	lithic reduction debris; Mogollon plain & corrugated wares	750-1250
10050	rock art	red & black pictograph elements in shallow overhang	none	550-1300
10052	pueblo	5-room squarish pueblo on ridge top slope	lithic reduction debris; Mogollon corrugated wares, Mimbres B/W & Mimbres WW sherds	550-1150
10053	check dams	a series of 8 remnant rock alignments across a ridge top drainage	Mogollon plain & corrugated sherds	750-1250
10055	pueblo	8 to 10-room squarish roomblock on wooded ridge top	lithic reduction debris; Mogollon corrugated & plainwares, Mimbres B/W & Mimbres WW sherds	550-1150
10056	rockshelter	long, shallow overhang with ca 3 stacked rock wall remnants	Mimbres WW sherd, Apache sherds	c 1150 & 1600-1900
10057	rockshelter	small, shallow overhang with large boulders	Mogollon plainwares, Apache sherds	c 750 & 1600-1900
10058	rockshelter	large, deep overhang with ca 6 subsurface rooms/units	lithic flake; Mogollon plainware sherd	550-1000
10059	rockshelter	small, shallow overhang w/ no interior features	Mogollon plainware and unknown WW sherd	550-1150
10060	rockshelter	deep overhang with several subsurface units	lithic reduction debris; Mogollon plain & corrugated wares, Apache sherds	550-1100 & 1600-1900
10061	rockshelter	small, shallow overhang with possible wall remnant	Alma Plain sherds	550-1150

10062	rockshelter	small shallow overhang with eroded floor	none	unknown
10063	rockshelter	very small overhang with roof blackening	none	unknown
10064	rockshelter	linear, deep but low overhang with shallow upper level	Apachean sherds	1600-1900
10065	rockshelter	small, very shallow alcove at base of cliff	lithic reduction debris; Mogollon plainwares, Apachean sherds	c 550-1150 & 1600-1900
10066	rockshelter	long, very shallow overhang with limited floor area	Mimbres WW sherd; 2-hand mano	1100-1150
10067	rockshelter	large, deep overhang; large boulder w/ grinding facets; pictographs	none	unknown
10068	rockshelter	linear, very shallow alcove; pictograph(s); bedrock mortars; trail	lithic reduction debris	unknown
10069	rockshelter	linear, shallow alcove; pictograph	lithic reduction debris; Mogollon plainware & Mimbres WW sherds	1150-1200
10075	pueblo	2 to 4-room squarish roomblock on wide, flat ridge	lithic reduction debris; Mogollon corrugated & plain, Mimbres B/W, Mimbres & Cibola WW sherds	1150-1200
10081	pueblo	1-room structure on narrow ridge	lithic reduction debris; Mogollon corrugated & plain sherds, Mimbres B/W, Mimbres & Cibola WW; trough metate	750-1200

10082	sherd/lithic scatter	small, light scatter on ridge slope	lithic reduction debris; Mogollon plainware, 3 Circle R/W & Cibola WW sherds	750-1200
10083	sherd/lithic scatter	small scatter of sherds and lithic material on ridge slope	lithic reduction debris; Mogollon plainware, unid. WW sherds; mano frags	550-1250
10085	rockshelter	long, shallow overhang with ceiling blackening	none	unknown
13658	pueblo	42 rooms in 8 masonry units within 5 caves; pictographs (Gila Cliff Dwellings)	lithic tools & debris; Mogollon corrugated & plainwares, Tularosa B/W, Mimbres B/W, Mimbres Boldface	1276-1325
54955	pithouse/ pueblo	c 200 rooms in 5 room blocks and 7 pitstructures on open ridge top (TJ Ruin)	lithic tools & debris; Mogollon corrugated & plainwares, 3 Circle R/W, Mogollon R/B, Mimbres Boldface, Mimbres B/W, Tularosa B/W, Gila Polychrome	600-1400
70318	lithic scatter	very light surface scatter on ridge slope	lithic tools & debris	unknown
70319	sherd/lithic scatter	very light surface scatter on alluvial fan in canyon bottom	lithic tool frags and reduction debris; Mogollon plainware, Reserve/ Tularosa B/W, & Cibola WW; mano	550-1150
70320	sherd/lithic scatter	very light surface scatter on wooded ridge slope	lithic reduction debris; Mogollon plain & corrugated	550-1000
70321	lithic scatter	very light surface scatter along small drainage	lithic reduction debris; modern cans	unknown
70322	lithic scatter	very light surface scatter on small ridge	lithic reduction debris	unknown

70323	lithic scatter	very light surface scatter on high ridge	lithic reduction debris	unknown
71159	stone circle	circular arrangement of 12 evenly-spaced rocks on end of ridge top	none	unknown
71225	lithic scatter	very light surface scatter along ridge top	lithic tools & reduction debris	unknown
71226	pueblo	2 to 3-room pueblo with associated trash scatter on top of slope in canyon bottom	lithic tools & reduction debris; Mogollon plain & corrugated sherds, 1 polychrome	750-1250
74166	lithic scatter	light surface scatter on ridge slope	lithic reduction debris	unknown

APPENDIX 5

RADIOMETRIC DATING OF TWO *PHASEOLUS METCALFI* SAMPLES

A.J.T. Jull

The University of Arizona
College of Arts & Sciences
Faculty of Science
NSF-Arizona AMS Facility
Building #81
Tucson, Arizona 85721
(602) 621-6810

May 8, 1990

Keith M. Anderson,
National Park Service,
Western Archaeological Center,
P. O. Box 41058,
Tucson, AZ 85717.

Dear Mr. Anderson,

We have obtained an accelerator date on your second sample of P. metcalfii from the Gila Cliff Dwellings National Monument. The result is given below:

Date no.	Sample	C-14 age, BP	Calibrated age
AA-5335	44-39-7B	405+/-60	1σ: 1433-1616AD 2σ: 1410-1640AD

The quoted one and two-sigma ranges are the 68% and 95% probability ranges for the calibrated age. This sample has a significantly different age than sample 44-39-7A (AA-3674) which we measured last year.

I enclose an invoice for $400.

Yours sincerely,

Timothy Jull

Dr. A. J. T. Jull

United States Department of the Interior

NATIONAL PARK SERVICE
WESTERN ARCHEOLOGICAL AND CONSERVATION CENTER
P.O. BOX 41058
TUCSON, ARIZONA 85717

MAY 24 1990

HRCA

IN REPLY REFER TO:
H2215 (GICL)
(WR) RWI

May 21, 1990

Memorandum

To: Ron Ice, Regional Archeologist
Southwest Cultural Resources Center

From: Chief, Division of Archeology
Western Archeological and Conservation Center

Subject: Another C14 date for Gila Cliff Dwellings

Enclosed is a date for the second Phaseolus Metcalfei bean from Gila Cliff Dwellings, about 160 years more recent than the first. An invoice is enclosed.

Keith

Keith M. Anderson

Enclosure

cc: w/enc
Eric Finklestein, Gila Cliff Dwellings

APPENDIX 6

CAVE DEPOSIT ANALYSIS FOR GILA CLIFF DWELLINGS

Steven J. Lambert

March 12, 1990

Mr. John Kramer
Resources Officer
Wilderness Ranger District
Rt 11, Box 100
Silver City, NM 88061

Dear Mr. Kramer:

At long last I have compiled the results of a few exploratory studies of the nature and origin of certain problematical cave deposits from Gila Cliff Dwellings National Monument. These samples were collected in the summer of 1988 by Wade Corder, at the suggestion of David Liboff, and sent to me for whatever analyses could be performed.

The following descriptions of samples were taken from the original letter of inquiry (Attachment A), and were also recorded in one of my laboratory notebooks:

> "Samples received with transmittal letter from Terry Nichols (Gila Cliff Dwellings National Monument), dated 19 Aug 1988; received 20 Aug 1988.
>
> 'Sample one is the shiny black coating from the cave ceiling.
>
> 'Sample two is also from the cave ceiling, but is dull black.
>
> 'Sample three is the shiny light coating found on many of the rocks [lining pits ~4-5 cm dia by ~1/2-1 cm deep, developed on flat rock surfaces of varied attitudes] in the caves.
>
> 'Sample four is the powdery inflorescence, collected up the canyon from the cliff dwellings, that Wade Corder talked to you about.'
>
> "The samples were designated GCD-1, -2, -3, and -4, respectively. In 10% HCl solution, GCD-1, -2, and -4 effervescence: -4 rapidly, -2 vigorously, and -1 slowly and steadily. GCD-4 is also apparently soluble in water; I suspect from these observations and its geological occurrence it may be Na_2CO_3-rich. The sample was damp on receipt (all 4 were in 1 1/2-dram glass vials)."

These samples were collected in order to address the following questions, as communicated in a letter (Attachment B) to the NPS Regional Director from the District Ranger (25 July 1988):

> "1. Why is the cave ceiling black? (The trail guide at the monument says because of smoke. We know of no studies that substantiate this claim.)

"2. Why are many of the rocks in the cave shiny?

"3. What is the mineral inflorescence forming near Cliff Dweller Canyon?"

Splits of each of the four samples were sent to the University of New Mexico for x-ray powder diffraction analysis, to identify the minerals they contain. The analyses and interpretations were graciously provided by Dr. Terry Sewards. Dr. Sewards' tabulations of the minerals found in each of the samples appears in Attachment C.

As the tabulation shows, "original minerals" in the substrate rock (Gila Conglomerate?) of the first three samples include quartz, clay, feldspar, and calcite, which one would expect to find in a clastic deposit such as conglomeratic sandstone. The calcite ($CaCO_3$) is responsible for most of the effervescence ("fizz") in the acid treatment described above, except for GCD-4, which is water-soluble. More interesting, however, and relevant to the objectives of this brief study, are the "secondary minerals".

The "shiny black coating from the cave ceiling" (GCD-1) appears to be rich in amorphous carbon, which "imparts black color". A likely origin for this material is indeed the accumulation of soot from smoke, as proposed in question # 1 of the second letter (Attachment B). This is in contrast to other possibilities I initially raised, such as manganese oxides/hydroxides, which would also be black. The fact that this material is amorphous carbon is consistent with the popular theory of soot accumulation from smoke, and "smoke" may be the best available explanation.

Note that no amorphous carbon was reported in sample GCD-2 ("dull black"), but that it contained an "unknown mineral - probably organic". My guess is that the *shiny* black material represents accumulation of volatile resins condensed from smoke, whereas the *dull* black material may have smaller concentrations of similar material that may not be in sufficient abundance to show up in the x-ray diffractogram. Whether or not resinous residue is actually present in the shiny black coating was not investigated. It is conceivable that solvent-extraction and liquid chromatography could identify such materials, but this would be a more painstaking and costly process than permitted by my limited ("bootlegged") funding. This endeavor alone might make a worthwhile master's thesis for someone, and if the resins (or whatever) were characteristic, it might in principle be possible to identify the material that was burned to produce the smoke (i.e., the wood growing at the time of human occupation). This makes for some interesting paleoenvironmental reconstructions that would tickle the fancy of those interested in studying climatic change over time spans of several hundred years. But enough of such speculation....

Most interesting, perhaps, is the "shiny" light-colored material on many of the cave rocks, represented by sample GCD-3. The ranger on duty (David Liboff) and I began speculating on this subject during my visit, when he found out I was a geologist/geochemist; that conversation was actually the origin of this project. The shiny light coating appeared to have accumulated in shallow pits as described above. Where edges were exposed, the coatings appeared to be layered at intervals of less than 0.1 mm, suggesting a progressive kind of deposition. Besides the ubiquitous "original minerals", the dominant secondary minerals reported were weddellite ($Ca(C_2O_4)\cdot 2H_2O$, dihydrated calcium oxalate), whewellite ($Ca(C_2O_4)\cdot H_2O$, monohydrated calcium oxalate), and uric acid (2,6,8-trihydroxypurine) hydrate. This mineral assemblage, Dr. Sewards told me, is characteristic of the minerals found in *kidney stones*! He had previously encountered these minerals in actual kidney stones he x-rayed for Dr. Klaus Keil, who periodically identifies kidney stones for a local hospital. I would guess that the presence of these minerals represents *evaporated urine*. Its origin (i.e., bat, packrat, human, feline, etc.) cannot be determined solely on the basis of these analyses, but it is only logical that inhabitants (human or otherwise) had to urinate somewhere. It may be possible in principle to differentiate the source of the urine based on the distribution of certain organic or trace constituents, but I am not informed as to the extent of the database necessary to make comparisons. I seriously doubt that this accumulation represents ancient packrat urine, because such material (known as "amberat") more typically occurs as a characteristic *dark brown* cement holding together a mass of twigs, pebbles and other debris composing the packrat nest. It is conceivable that the deposits represent a leached residue of bat guano that may have formed at the bottom of a guano deposit, most of the guano deposit having been since stripped away, but I do not know if such a resulting deposit would resemble the pale tan-colored lustrous rock coatings.

The pits in the rock in which these shiny deposits occur may be the result of partial dissolution of rock as a result of repeated urination by something or someone. The laminated structures in these local accumulations represent prolonged, periodic activity concentrated within a restricted space. I am not a trained archeologist, but I might speculate that the aged, infirm, or very young might not leave the cave to urinate. Alternatively, the presence of these deposits on *flat, tilted rocks* may also indicate that these accumulations were the sites of hide-processing (it is known that in historic times urine was used as a tanning agent). Again, the origin of these deposits is speculative, but the mineral identifications are conclusive. I shall retain these samples for possible radiocarbon dating (also "bootlegged"); if they are contemporaneous with human occupation, the possibility that the "urine" deposits are human would be strengthened.

For comparison, Terry Sewards included a report of the mineralogy of scrapings from Sandia Man Cave, the site of late Pleistocene prehistoric human habitation near Albuquerque; similar minerals were observed--whewellite, uric acid hydrate, and amorphous carbon.

GCD-4, representing inflorescences scraped from an occurrence of rock near Cliff Dweller Canyon by Wade Corder, is dominantly quartz (SiO_2), again common to sandstones and conglomerates, and trona ($Na_2CO_3 \cdot NaHCO_3 \cdot H_2O$). In a telephone conversation, Wade suggested that this material tasted like "Arm-and-Hammer Baking Soda" ($NaHCO_3$), and I suggested also the possibility of "Arm-and-Hammer Washing Soda" (Na_2CO_3) also. As the mineral identification shows, we were both right. These carbonate minerals would readily "fizz" in acid, as I observed when I received the samples. Trona is a mineral that is commonly formed during the *weathering* of silicate rocks, such as the conglomerate common in the area. An explanation of this weathering reaction involves the attack of feldspar (calcium- and sodium-aluminum silicates) by carbonic acid formed by the combination of rainwater and atmospheric carbon dioxide. The sodium leaches out and is precipitated as carbonate and bicarbonate (the mineral trona). The calcium appears as calcite ($CaCO_3$). Trona is common in certain lake deposits in desert environments, but for it to be found elsewhere, either the rainfall needs to be rare, or else the mineral needs a sheltered environment (like a cave) so as not to be washed away, because it is so soluble.

I analyzed the GCD-2 sample (16% $CaCO_3$) for the $^{18}O/^{16}O$ and $^{13}C/^{12}C$ ratios in its calcite, and found it to be characteristic of a normal marine carbonate ($\delta^{18}O$(SMOW)=+28.8‰; $\delta^{13}C$(PDB)=+0.9‰).

I have not provided copies of the original x-ray diffraction data; if these diffractograms are of interest to you for your files, please request them.

I am not sure but what we have raised more questions than we could satisfactorily answer, but that is typical of any scientific investigation.

Best wishes in trying to make sense of all this.

Sincerely,

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFIED PROFESSIONAL GEOLOGICAL SCIENTIST
7080
AIPG
STEVEN J. LAMBERT

Steven J. Lambert, Ph.D.
Geochemistry Division 6233
Sandia National Laboratories
Albuquerque, NM 87185

Copy (w/ 3 attachments) to:
Jim Bradford (NPS SW Region)
Dr. Milford Fletcher
Janet Hurley (Gila)
Ron Ice (NPS SW Region)
David Liboff (Albuquerque)
Pete McKenna (NPS SW Region)
Terry Nichols (Aztec Ruins)
Dr. Terry Sewards (UNM)
Dr. Steven J. Lambert (SNLA)

United States Department of Agriculture | Forest Service | Wilderness Ranger District | Route 11, Box 100
Silver City, NM 88061

Reply To: H22/1530
xN22/1530
Date: August 19, 1988

Dr. Steven Lambert
10409 Toltec Road NE
Albuquerque, NM 87111-5050

Dear Dr. Lambert,

Enclosed are the four samples that you so generously offered to analyze:

Sample one is the shiny black coating from the cave ceiling.
Sample two is also from the cave ceiling, but is dull black.
Sample three is the shiny light coating found on many of the rocks in the caves.
Sample four is the powdery inflorescence, collected up the canyon from the cliff dwellings, that Wade Corder talked to you about.

The results of your analyses will not only satisfy the curiosity of many of the rangers here, but will allow our staff to answer several questions commonly asked by the public. Since the Forest Service's budget is very limited, it is unlikely that we could have afforded to pay for these tests. Your offer to have Sandia National Laboratory do the work free is expecially kind.

We all look forward to hearing the outcome of your analyses. Please contact Park Ranger Terry Nichols at (505) 536-9461 if you have any questions.

Sincerely yours,

Jan Hurley

JANET HURLEY
District Ranger

Enclosure

GILA CLIFF DWELLING SAMPLES

for Steve Lambert

Sample GCD-1

Original minerals:

Quartz
Clay
Feldspar
Calcite

Secondary minerals:

Weddelite ($C_2CaO_4 \cdot 2H_2O$)
Uric Acid Hydrate ($C_5H_4N_4O_3 \cdot 2H_2O$)
(+ amorphous carbon - imparts black color)

Sample GCD-2

Original Minerals:

Quartz
Clay
Feldspar
Calcite

Secondary Minerals:

Uric Acid Hydrate
(+ unknown mineral - probably organic)

Sample GCD-3

Original Minerals:

Quartz
Clay
Feldspar
Calcite (trace)

Secondary Minerals:

Wedellite
Whewellite
Uric Acid Hydrate
(+ unknown mineral - probably organic)
(+ amorphous carbon)

Sample GCD-4

Minerals:

Trona ($Na_2CO_3 \cdot NaHCO_3 \cdot 2H_2O$)
Quartz

Sample Sancave (Sandia Man Cave roof scrapings)

Original Minerals:

Calcite
Quartz
Clay

Secondary Minerals:

Whewellite
Uric Acid Hydrate
(+ amorphous carbon)

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1. Larry Murphy, James Baker, David Buller, James Delgado, Roger Kelly, Daniel Lenihan, David McCulloch, David Pugh, Diana Skiles, Brigid Sullivan. *Submerged Cultural Resources Survey : Portions of Point Reyes National Seashore and Point Reyes-Farallon Islands National Marine Sanctuary.* Submerged Cultural Resources Unit, 1984.

2. Toni Carrell. *Submerged Cultural Resources Inventory: Portions of Point Reyes National Seashore and Point Reyes-Farallon Islands National Marine Sanctuary.* Submerged Cultural Resources Unit, 1984.

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