OFFICE OF ARCHAEOLOGICAL STUDIES

TESTING RESULTS AND DATA RECOVERY PLAN FOR SITES IN THE MOGOLLON HIGHLANDS, CATRON COUNTY, NEW MEXICO

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with a contribution by Kilian Melloy

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ADMINISTRATIVE SUMMARY

During April and May 1990, the Office of Archaeological Studies conducted a testing program at 21 prehistoric sites located along a 17.7 km (11 mile) segment of US 180 from the Pine Lawn Valley to the crest of the San Francisco Mountains in Catron County, New Mexico. A preliminary survey was first conducted by Oakes (1989). All sites are within a proposed project to improve and widen U.S. 180 by the New Mexico State Highway and Transportation Department and are on USDA Forest Service land in the Gila National Forests.

Nine of the sites are not likely to yield further information on the prehistory of the region and no additional work is recommended. Twelve of the tested sites have potential to produce important information on the cultural development of the area and data recovery is proposed for these sites. Two additional sites that were not tested are likely to yield important information and are recommended for data recovery.

The sites range in time from the Middle Archaic period through the Tularosa phase of the Mogollon culture (ca. 3500 B.P. to A.D. 1150). Ceramic types, projectile points, and site architecture were used to date the sites, which include Archaic lithic artifact scatters with associated hearths and pits, pithouse units, room blocks and activity areas associated with cobble room blocks.

A data recovery plan is presented for each site emphasizing mobility patterns as influenced by the domestication of cultigens from the Archaic to Pueblo period in the Mogollon Highlands.

MNM Project No. 41.453
NMSHTD Project No. SP-0F-013-2(210) CN 1858
Gila/Apache National Forest Special Use Permit

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INTRODUCTION

The Office of Archaeological Studies, Museum of New Mexico conducted an archaeological testing program along a 17.7 km (11 mile) section of US 180 near Reserve, Catron County, New Mexico (Fig. 1) between April 2 and May 31, 1990. The work was conducted at the request of William L. Taylor of the New Mexico State Highway and Transportation Department (NMSHTD) in connection with proposed road shoulder widening for Project No. SP-OF-013-2(210) CN 1858.

The field crew consisted of Yvonne R. Oakes, project supervisor, Dorothy A. Zamora, assistant supervisor, and crew members Lewis Kimmelman, Anthony Martinez, Sibel Melik, Kilian Melloy, and Antonio Torres. David A. Phillips, Jr. served as principal investigator for the project. Richard Newton of the Reserve Ranger District, Gila National Forest served as the Forest Service liaison. A total of 264 person days were spent in the field and 103 person days in research and report preparation.

Twenty-one sites were tested and 12 of these are considered to have the potential to yield important information on the prehistory of the Mogollon region and are recommended for data recovery. Nine sites were tested and the data potential of these sites is considered limited and no further work is recommended. Two additional sites were not tested but are within the proposed right-of-way and are likely to yield important information and thus are also recommended for data recovery. Recommendations for each site are presented in Table 1.

All sites are within the Gila National Forest. Site locations and legal descriptions are provided within the report. The testing was completed under Gila/Apache National Forest Special Use Permit.

Table 1. Site Descriptions and Recommendations

SITE	DESCRIPTION	RECOMMENDATION
3563	Activity area of San Francisco phase cobble mound	Data Recovery
9721	Reserve phase cobble mound	Data Recovery
37917	Middle to Late Archaic lithic scatter/possible pits	Data Recovery
37918	Unknown lithic scatter (disturbed)	No Further Work
37919	Late Archaic lithic scatter/burn areas	Data Recovery
39975	Late Pinelawn phase pithouses	Data Recovery
38879	Noncultural cobble pile	No Further Work
43785	Mogollon artifact scatter; no features	No Further Work

43786	Activity area of Reserve phase cobble mound with charcoal deposits	Data Recovery
43788	Activity area of Reserve phase cobble mound; no features in r-o-w	No Further Work
70188	Middle to Late Archaic lithic scatter/pits	Data Recovery
70189	Activity area of Reserve phase cobble mound/burned surface pits	Data Recovery
70190	Noncultural cobble pile	No Further Work
70191	Possible Pinelawn phase pithouse/pits	Data Recovery
70192	Mogollon lithic scatter	No Further Work
70196	San Francisco phase pithouses/pits	Data Recovery
70200	Isolated artifacts	No Further Work
70201	San Francisco phase pithouses/pits	Data Recovery
70202	Isolated artifacts in r-o-w	No Further Work
70203	San Francisco phase artifact scatter; no features in r-o-w	No Further Work
75791	Pinelawn phase pithouses	Data Recovery
75792	Activity area of Tularosa phase cobble mound with charcoal deposits	Data Recovery
78439	Late Pinelawn phase pithouses	Data Recovery

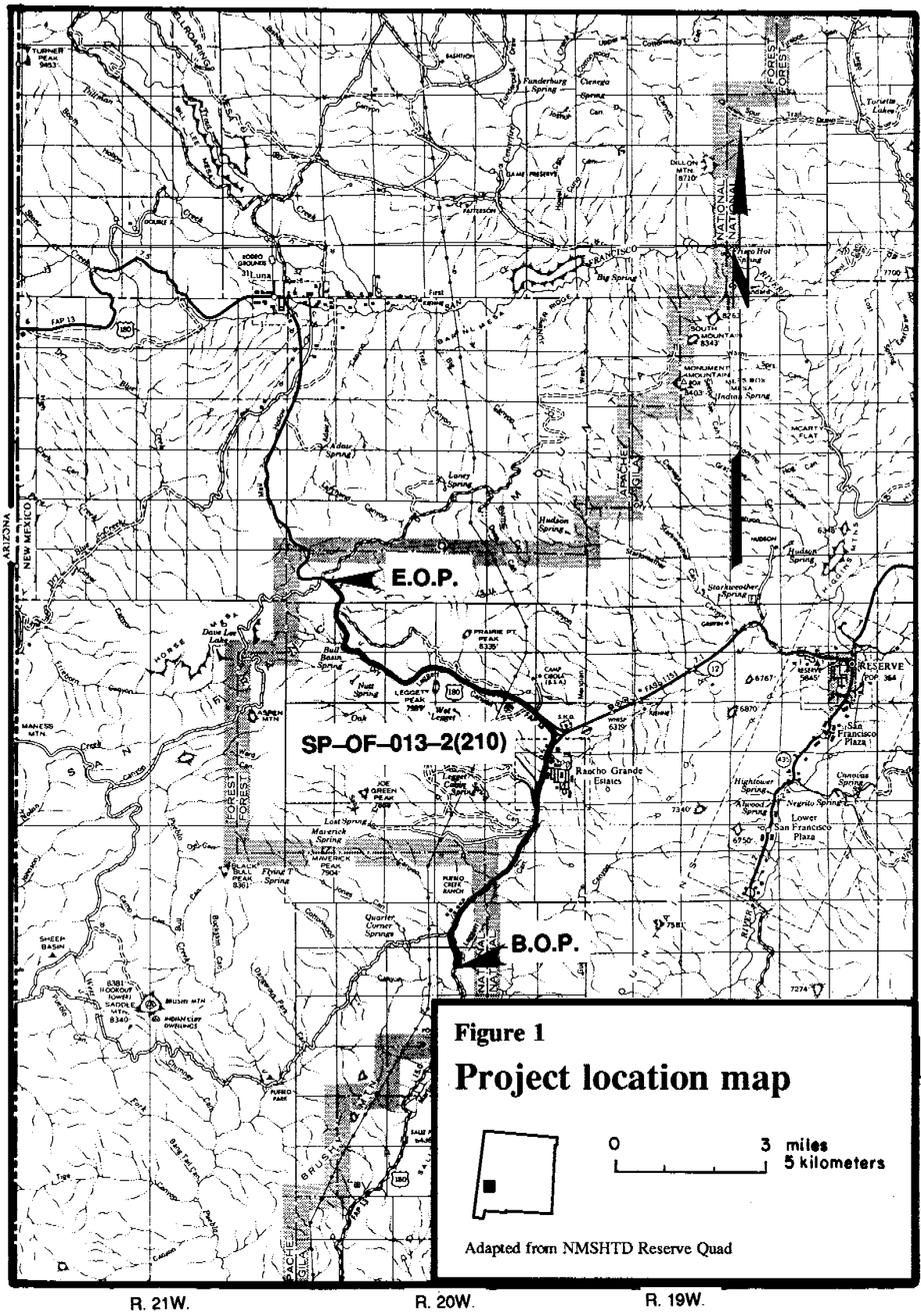

Figure 1

Project location map

ENVIRONMENT

Kilian Melloy

The project right-of-way extends along U.S. Highway 180. Archaeological work for the project begins about 8 km (5 mi) south from the junction of U.S. Highway 180 and State Highway 12 and continues north toward Luna for approximately 9.5 km (6 mi) more. The project area is within the Gila National Forest and is bounded by the San Francisco Mountains to the north and west; by the Saliz Mountains to the east, continuing to the south; and the Brushy Mountains to the south and west. The terrain throughout the project area is mountainous and forested, characterized by steep slopes leading down to deep-cut drainages, and interspersed pateches of level meadowlands. Elevation along the project right-of-way ranges from 1,981 m (6,500 ft) to 2,073 m (6,800 ft). Major drainages in the area include Leggett Canyon to the south, Dry Leggett Canyon to the north, and Gordon Canyon to the southeast. Nearby drainages include Wet Leggett Spring, Wet Leggett Canyon, Bull Basin Spring, and a number of arroyos. All the drainages flow intermittently.

At the beginning of the project, southwest of Reserve on U.S. Highway 180, the geology consists of the Gila conglomerate group and is of Pliocene-Pleistocene age. At the junction of U.S. Highway 180 and State Highway 12, about 11 km (ca 7 mi) west and slightly south of Reserve, the geology extends into Quaternary, of Pleistocene and recent formations. The remainder of the project is located in Tertiary Datil formations: volcanically formed clastic rock, andesite flows, andesite and basaltic flows, and coarse clastic rocks and boulders that are mainly of volcanic origins (Dane and Bachman 1965). Gwynn and Eckelberger Canyons provide a source of obsidian in the form of 'Apache tears,' which are inclusions eroding out of a matrix of brittle hydrated obsidian transforming to perlite (Bart Olinger, personal communication, 1990). Specific material sources on the project sites are outcrops of basalt, rhyolite, and granite. Undifferentiated chert and Luna agate occur locally in the gravels.

According to Maker et al. (1972:18-23), the main soil associations in the area are of two types, Campico-Tampico-Mirabal and San Mateo-Shanta. Of these two soil associations, Campico-Tampico-Mirabal is more prevalent, accounting for all but a 1.6 km (1 mi) stretch along the project right-of-way. Campico-Tampico-Mirabal soils originate from igneous and conglomerate rock sources and supports various flora indigenous to the region. Timber and grasses, for example, are well sustained by this soil association. Even so, Campico-Tampico-Mirabal are not suited to irrigation. San Mateo-Shanta, by contrast, is 90 percent irrigable by modern methods, and is found in floodplains and in association with major drainages. Nonirrigated San Mateo-Shanta soil supports grasses suitable to the grazing of livestock.

Moving northwest through the project area, near Reserve toward Luna, the Upper Sonoran Life Zone changes into the Transitional Zone (Bailey 1913; Berman 1979:7). Although the Luna project elevation starts at the extreme upper boundary of the Upper Sonoran Life Zone (1,981 m or 6,500 ft), the flora encountered is consistent with that described for the Upper Sonoran Life Zone in general. As pointed out by Berman

(1979), the Upper Sonoran Life Zone is determined to be from about 1,372 m (4,500 ft) to about 1,981 m (6,500 ft) and is dominated by piñon *(Pinus edulis)* and juniper (*Juniperus* sp.). Also present in this zone are cacti of different varieties (*Opuntia* sp.), yucca (*Yucca* sp.), oak (*Quercus* sp.), and assorted grasses. Where drainages make their ways through this zone, riparian communities flourish. These communities include cottonwood *(Populus fremonti* and *Populus sargentii)*, walnut *(Juglans major)*, sycamore *(Platanus wrightii)*, willow *(Salix amigdabides)*, and box elder *(Acer negundo)*. In the Transitional Zone, generally accepted as ranging from 1,981 m (6,500 ft) to about 2,438 m (8,000 ft), ponderosa pine *(Pinus ponderosa)* and Gambel oak *(Quercus gambelii)* prevail, accompanied by rabbitbrush *(Chrysothamnus nauseosus)*, broom snakeweed *(Gutierrazia sarothrae)*, box elder *(Acer negundo)*, and birchleaf mountain mahogany *(Cercocarpus betuloides)*. In the upper reaches of the Transitional Zone are found kinnikinnick or bearberry *(Arctostaphylos uva-ursi)*, thimbleberry *(Rubus parviflorous)*, Apache pines *(Pinus engelmanii)*, and Chihuahuan pines *(Pinus leiophylla)*. Along drainages and other sources of water grow narrowleaf cottonwood *(Populus angustifolia)*, thinleaf alder *(Alus tenuifolia)*, water birch *(Betula occidentalis)*, chokecherry *(Prunus virginiana)*, and other flora. Berman (1979) lists Elmore (1976:110-156) as her source for this catalogue. In addition to these, the field crew of the Luna project noted prickly pear (*Opuntia* sp.) and Indian ricegrass *(Oryzopsis hymenoides)*.

Fauna observed throughout the project area include javelina *(Dicotyles tajacu)*, whip scorpion *(Mastigoproctus giganteus)*, tarantula (*Eurypelma* sp.), deer (*Odicoileus* sp.), elk *(Cervus canadensus)*, golden eagle *(Aquila chrysaetos)*, bullsnake (*Pituophis* sp.), rattlesnake (*Crotalus* sp.), horned toads colored to match their immediate habitats (*Phrynosoma* sp.), mountain lion *(Felis concolor)*, cottontail (*Sylvilagus* sp.), jackrabbit (*Lepus* sp.), coyote *(Canis latrans)*, hummingbirds (family Trochilidae), turkey vultures *(Cathartes aura)*, and bear *(Ursus americanus)*.

The climate of the Gila National Forest area is semihumid/humid (Berman 1979:5). The annual average precipitation in the Reserve area is between 20.3 cm (8.0 in) and 65.3 cm (25.7 in), based on records from 1951-1980; annual snowfall in Reserve averages 38.1 cm (15 in) (Williams 1986). Two-thirds of the annual precipitation is received in the Reserve area from late spring to early autumn; fully half of the annual precipitation falls from July to September in cloudbursts of short duration. The Reserve Ranger Station, at an elevation of 1,778 m (5,832 ft), records annual mean temperatures over one 12 year stretch as follows: maximum, 22 degrees C (72 degrees F); minimum, -0.5 degrees C (31 degrees F). The average date for the last frost is June 1 and the first frost is September 29, with the average growing season lasting for 120 days (Maker et al. 1972:7).

CULTURAL OVERVIEW

(The following information is taken from Oakes's [1989] survey report of this particular area.)

Existing Data Base

The project area lies within the heartland of the Mogollon culture. The concept of a Mogollon culture originally created much debate among archaeologists when Emil Haury (1936) defined it as a culture unit from his surveys and excavations in the area from 1931 to 1935. Earlier work had been carried out in the area by Hough (1907, 1919), but not until Haury's studies was the Mogollon culture distinguished from the Anasazi and Hohokam (Reid 1986:1). Archaeological interest in Mogollon cultural characteristics and their temporal placement ran high in the 1930s. By the late 1930s, Paul Martin had established an archaeological field camp at Pine Lawn in the project area. He began a series of excavations in the area, primarily at the SU site (Martin 1940, 1943) and at Turkey Foot Ridge (Martin and Rinaldo 1950), both adjacent to the project area. Martin was joined by John Rinaldo in the Pine Lawn Valley, and they collaborated on site investigations in this area (Martin and Rinaldo 1947; Martin et al. 1949, 1950). Other archaeologists pursuing a keen interest in this region include Danson (1957), Peckham (1958), and Kayser (1972). Later work includes surveys by the University of Texas (Neely 1978), NMSHTD (Koczan 1983), University of New Mexico field schools at the SU site, and several Forest Service surveys on record at the Luna and Reserve ranger stations.

Detailed overviews of the area have been completed by Berman (1979), LeBlanc and Whalen (1980), and Stuart and Gauthier (1981). Recently, scholars have shown a renewed interest in the area, concentrating on problem-solving research. Many have concerned themselves with the origins of horticulture in the project area. Gilman (1983, 1987) focuses on changing house forms as a response to varying resource needs. Minnis (1985) looks at various models for the adoption of cultigens, and Hunter-Anderson (1986) examines the role of increasing population pressure as a cause for intensification of agricultural production. Wills (1988a) studies the geographical characteristics of population changes and mobility leading to the use of domesticates within the project area. More recently, Cordell and Gumerman (1989) have included the Mogollon area in a general scheme of changing adaptations occurring throughout the Southwest between A.D. 200 and A.D. 1540.

Further research in the study area is certainly warranted by our increasing data base. We now have an opportunity to examine in even further detail such aspects of Mogollon and pre-Mogollon culture as the shift from hunting and gathering to horticulture, changing settlement sizes through time, clarification of phase designations, locational patterning, reasons for architectural variability, causes of economic stress, population dynamics, and changing resource utilization through time.

Cultural Setting

Paleoindian Period (9500-6000 B.C.)

Paleoindian adaptations are characterized by a hunting economy that focused on late Pleistocene faunal species. Because of changing environmental conditions, faunal populations gradually changed also, causing a shift in Paleoindian subsistence resources. This change occurred as early as 8000 B.C., when Paleoindian peoples used a broad variety of floral and faunal species (Chapman 1980:11-12).

No Paleoindian sites have been located within the project area. Sites have been located on the Plains of San Agustin, 45 km to the east (Hurt and McKnight 1949; Bussey and Beckett 1974). Two other late Paleoindian sites have been recorded near Quemado (Honea and Benham 1963; Honea 1969; Eck 1982). Paleoindian projectile point collections have been made by ranchers in the area. These include Clovis points (9500-9000 B.C.) and Cody-complex points (7000-6000 B.C.).

The occurrence of Paleoindian sites in montane areas, such as the project area, is rare. However, some sites have been found in the Sangre de Cristo Mountains in northern New Mexico and at high elevations in Colorado. In general, Paleoindian sites are located in deflated sand dunes at the edges of playas. Isolated diagnostic projectile points are also found in this setting.

Archaic Period (6000 B.C.-A.D. 200)

Archaic populations consisted of mobile hunters and gatherers who used a broad variety of wild resources on a seasonal basis. Sites are characterized by distinct projectile point styles, increasing use of ground stone, and the presence of fire-cracked rock (Kayser 1988:3-4). During the Late Archaic period, there is evidence for the use of cultigens from plant remains and the increased use of ground stone.

Archaic sites occur in a variety of elevational and topographic zones: deflated blowouts, above edges of former lake terraces, along arroyo banks and streams, near springs, and in the high mountains of Gila National Forest (Berman 1979:18, 21). Recorded sites include rock shelters, caves, lithic artifact scatters, and one pithouse site. Occupied caves include Tularosa Cave (Martin et al. 1952), O Block Cave (Martin et al. 1954), and Bat Cave (Dick 1965). The open pithouse site is Wet Leggett, adjacent to the project area and recorded by Martin and Rinaldo (1950).

Beckett (1973) thinks that cave sites were used for winter occupation, while lower elevation dune sites were used from spring through fall. However, Heller (1976:56) found some young faunal specimens at Tularosa Cave, suggesting a possible late summer or early fall occupation. Other researchers have disputed Beckett (1973), arguing that winter sites were occupied at the lower elevations, and summer sites were located in the mountains (Davis 1963; Hunter-Anderson 1986).

Two Archaic cultural traditions are known in the general region: Cochise and Oshara. The two traditions are distinguished by projectile point style and geographic distribution of the points. The Cochise is considered to be the basis for the later Mogollon culture in southwest New Mexico, while the Oshara tradition is associated with the Anasazi in northern New Mexico. Boundaries between the two are vague. The Oshara sites date from 5500 B.C. to A.D. 600 based on six separate stages devised by Irwin-Williams (1973). No sites of this type have been found in the study area.

The Cochise tradition was originally considered a manifestation of the Desert Culture found in southeastern Arizona (Sayles and Antevs 1941). It has long been thought to include three stages: Sulphur Springs (7500-3500 B.C.), Chiricahua (3500-1500 B.C.), and San Pedro (1500-200 B.C.). Irwin-Williams (1979) has broadened these dates and left a major gap between the Sulphur Springs and Chiricahua phases. Her chronology is: Sulphur Springs (9000-6000 B.C.), Chiricahua (3500-1000 B.C.), and San Pedro (1000 B.C.-A.D. 200). Sayles (1983) fills the gap with the Cazador phase (7000-6000 B.C.). However, the Cazador phase may only be valid for the Arizona area. No sites dating to the early Sulphur Springs phase have been found in New Mexico. Hogan (1985:9) suggests that Archaic populations did not occupy the mountains of the study area until late in the Chiricahua phase, about 3500 B.C.

Several sites of the Cochise tradition have been dated through radiocarbon analysis. A date of 2556 ± 680 B.C. has been obtained for Wet Leggett Arroyo site (Martin et al. 1949); 3981 ± 310 B.C. for the Chiricahua component at Bat Cave (Dick 1965:105), and 273 ± 200 B.C. for corn from the San Pedro phase at Tularosa Cave (Martin et al. 1952:500). These dates are uncorrected.

As a result of his investigations at Bat Cave, Dick (1965) suggested that maize was present in this area as early as 3500 B.C., in the early Chiricahua phase. Later research has questioned the association of the early date with maize (Berry 1982; Minnis 1985; Wills 1988a). Maize does not appear again in the archaeological record in the study area until around 1250 B.C. at Tularosa Cave (Martin et al. 1952).

The Archaic period ends with the introduction of pottery into the subsistence system. No explanation for the adoption of this significant technological change is usually offered (Hunter-Anderson 1986), although the use of ceramics corresponds with the storage and later soaking and boiling of horticultural products for winter use as populations became less mobile.

Mogollon Period (ca. A.D. 200-1350)

The Mogollon culture developed out of the Archaic Cochise tradition in southwestern New Mexico and southeastern Arizona. The transition between the Archaic and the Mogollon period is generally marked only by the appearance of brown ware pottery. In the Mogollon period, we see the use of pithouse dwellings with a gradual shift to masonry above-ground structures, ceremonial units, and an increasing use of cultigens. Reasons given for these adaptations vary, and include increasing population pressure, restricted mobility, and environmental stress.

The use of various taxonomic designations to describe cultural development in the Mogollon area is somewhat confusing. We shall follow the lead of Berman (1979), who expands the original taxonomic system that Haury (1936) devised specifically for the Pine Lawn Valley. Phase classifications are Pinelawn (ca. 150 B.C.-A.D. 500), Georgetown (A.D. 500-A.D. 700), San Francisco (A.D. 700-A.D. 900), Three Circle (A.D. 900-A.D. 1000), Reserve (A.D. 1000-A.D. 1100), and Tularosa (A.D. 1100-A.D. 1350). We understand that there may be problems in assigning sites to rigid phases or time frames, and these difficulties will be examined as we pursue further study in the area. Some researchers classify sites as Pithouse phase or Pueblo phase, with a break after the Three Circle phase at approximately A.D. 1000. LeBlanc (1976) therefore considers Pithouse sites as Early (Pinelawn-Georgetown) or Late (San Francisco-Three Circle). Sites from all of the Mogollon phases have been recorded within the Gila/Apache National Forest.

Early Mogollon sites of the Pinelawn and Georgetown phases that have been excavated either within or near the project area include Luna Junction (Peckham 1963), Mogollon Village (Haury 1936), Pine Lawn Camp Pithouse (Rinaldo n.d.), Promontory (Martin et al. 1949), Starkweather Ruin (Nesbitt 1938), the SU site (Martin 1943; Martin and Rinaldo 1947), Three Pines Pueblo (Martin and Rinaldo 1950), and Turkey Foot Ridge (Martin et al. 1949; Martin and Rinaldo 1950). The SU site, which lies about 200 m east of the project area, is currently being reexamined by W. H. Wills through the University of New Mexico field school program.

Pithouses during this time indicate both year-round and seasonal use (Lightfoot and Jewett 1986). An attempt to explain these variations in terms of mobility patterns is provided by Hunter-Anderson (1986).

Most early Mogollon sites tend to be in elevated areas such as mesa tops, knolls, ridges, and hilltops. Berman (1979:30) argues that these areas may not necessarily have been selected as defensive locations, but rather for accessibility to water or arable land, protection from flooding, presence of good drainage, or a commanding view of the area. By the San Francisco and Three Circle phases, there is a general shift in site locations to more accessible ridges or terraces, and closer to floodplain areas. Berman (1979) suggests that this may indicate increasing dependence on agriculture. Sites of the San Francisco and Three Circle phases that have been examined within or near the project area include Hillside Pueblo (Peckham 1958), Oak Springs Pueblo (Martin et al. 1949), the Sawmill site (Bluhm 1957), South Leggett Pueblo (Martin et al. 1950), Starkweather Ruin (Nesbitt 1938), the Switchback site (Peckham 1957), Three Pines Pueblo (Martin et al. 1950), Wet Leggett Pueblo (Martin et al. 1950), and Y Canyon Cave (Martin et al. 1954).

Most researchers indicate that pithouse sites are randomly laid out with a lack of formal planning (Bullard 1962; Berman 1979; Kayser 1988). However, Lightfoot and Jewett (1986) believe they have isolated a pattern described loosely as circular house clusters around a central ceremonial or social unit. Early pithouses tend to be round (a few are bean-shaped), with a variety of post-support patterns. By the San Francisco phase, houses are generally more square. Entryways range from long and narrow to short and wide and are often stepped; however, there is no consistent

doorway alignment. The size of the pithouses varies from site to site. The largest structures (30 sq m) occur during the Pinelawn phase and decrease in size thereafter. Early ceremonial units are frequently larger pithouse types. Extramural hearths, storage pits, and burials are frequently found on pithouse sites.

Mogollon ceramics make their first appearance during the Pinelawn phase, and their presence on these sites is usually sparse. Initial pottery consists of a plain brown ware called Alma Plain with an Alma Rough variant, followed soon after by San Francisco Red. Smudged wares are prevalent by the San Francisco phase along with Three Circle Red-on-white. By the late Three Circle phase, Reserve Black-on-white begins to appear (Berman 1979).

Subsistence adaptations during these Mogollon pithouse phases include the procurement of wild game and plants and the raising of maize, kidney beans, squash, and various gourds.

By the Reserve phase (ca. A.D. 1000) pithouse dwellings give way to above-ground units. Sites of the Reserve phase that have been excavated within or near the project area are Hillside Pueblo (Peckham 1958), Oak Springs Pueblo (Martin et al. 1949), the Sawmill site (Bluhm 1957), South Leggett Pueblo (Martin et al. 1950), Starkweather Ruin (Nesbitt 1938), Switchback site (Peckham 1957), Three Pines Pueblo (Martin et al. 1950), Wet Leggett Pueblo (Martin et al. 1950), and Y Canyon Cave (Martin et al. 1954).

During the Reserve phase, site density was at a peak. Sites also extended further into previously unoccupied areas and at generally lower elevations. Sites are found on benches or terraces above drainages and on low mesas, hills, and valley floors.

In this phase, we see the appearance of above-ground masonry habitation sites. These usually consist of an L-shaped series of contiguous rooms. Units of three rooms or less are generally considered fieldhouses, while permanent residences may contain up to 30 rooms. Jacal structures are present but seem to be uncommon.

Black-on-white ceramics become common during this time. These include Reserve Black-on-white, Tularosa Black-on-white, and Mimbres Classic. Mogollon black-on-white ceramics have been seen as an imitation of Anasazi practices, although research suggests that such pottery developed locally (Minnis 1981).

The latest Mogollon period sites in this part of southwest New Mexico are assigned to the Tularosa phase. Sites of this time frame that have been excavated within or near the project area are Higgins Flat Pueblo (Martin et al. 1957), Hough's Site 69 (Wendorf et al. 1963), Starkweather Ruin (Nesbitt 1938), and the WS Ranch site (Neely 1978).

These sites are larger than those of preceding phases; however, there are fewer of them, suggesting a consolidation of smaller villages into centralized communities. Site locations apparently do not vary from those of the Reserve phase. Sites range from one or two rooms to multistoried structures of over 100 rooms. Sites generally consist

of 20 to 25 masonry rooms. The ceramic assemblage includes Tularosa Black-on-white, Tularosa White-on-red, and St. Johns Polychrome (a late manifestation). Although the population was primarily agricultural, wild resources were also exploited.

A gradual abandonment of the Mogollon area began around A.D. 1300. Rice (1975) believes the first abandonments occurred along minor drainages, in narrow valleys, and at the higher elevations, above 2,100 m (7,000 ft). The Pine Lawn Valley, with the exception of Starkweather Ruin, was actually abandoned earlier, by the close of the Reserve phase. The San Francisco River area near Luna contains sites dating up to the early Tularosa phase. After ca. A.D. 1350, the Gila National Forest region seems to have been completely abandoned until the arrival of the Apaches. Local Mogollon peoples may have migrated north to the Zuni area (Bullard 1962:9; Hogan 1985:11).

Apache and Spanish Periods (ca. 1600-1880)

This section is derived primarily from Wozniak (1985). By the end of the sixteenth century and throughout the seventeenth century, the pueblos of Zuni and Acoma, to the north of the project area, were frequently raided by Apaches from the mountains in the Mogollon area (Scholes 1942). The exact locations of Apache strongholds are unknown. Spanish records suggest there were four Apache groups centered south of Zuni (Schroeder 1974). One of these, the Chilinos, occupied the area in and around the San Francisco Mountains. Apaches remained in the area throughout the first half of the eighteenth century.

In 1747, a Spanish expedition reached the Zuni area by way of the San Francisco and Gila rivers (Thomas 1932). The expedition, under Bernardo de Miera, reported Apache rancherias in the San Francisco Valley. By the 1780s, Apaches and Navajos had become allies and made joint raids in Arizona and northern Mexico. In 1788, a Mexican punitive expedition headed north from Sonora, Mexico, and reported the presence of Apaches in the San Francisco Mountains (Thomas 1932). Another incursion from Sonora to Zuni in 1795 traversed the San Francisco and Gila rivers and again noted the presence of Apaches in these mountains.

There are no further accounts of Apaches in this area until the late 1850s. The Apaches seemed to have focused much of their attention south toward Chihuahua and Sonora. However, in 1857 Apaches raided farmsteads near Zuni and returned to the San Francisco River area (Schroeder 1974).

Navajo refugees were reported living south of Zuni by 1859. In 1860, a U.S. military campaign drove Navajos into the San Francisco and Mogollon mountains. Navajos remained in the general area until the establishment of the Navajo Reservation in 1868. This left the region open to the Apaches. In 1869, a treaty with the U.S. government supposedly confined the Indians to an area south of the Gallo Mountains. Between 1872 and 1874, various Apache groups were sent to a reservation along Tularosa Creek (Fraser 1965). But in 1874, Fort Tularosa, built to protect government officials against attack in 1872, was abandoned because the Apaches were moved to

Ojo Caliente, New Mexico. Through the remainder of the 1870s, Apache outbreaks continued. The defeat of Geronimo in 1885 ended Apache dominance of the Mogollon region.

Historical Period (1874-Present)

Once the Apache were removed to a reservation in Arizona in 1874, the Mogollon area became attractive to settlers from other regions. In that year, several families from Socorro settled at Lower San Francisco Plaza, south of present-day Reserve. They were soon joined by soldiers and their families from Fort Tularosa, who settled at Upper San Francisco Plaza. By the 1880s, settlement of the region was spurred by the construction of railroad lines throughout New Mexico and the resulting higher prices for sheep and cattle. In fact, there was a cattle and land boom in the general area around Quemado, culminating in the formation of large land and cattle companies. Severe winters and long droughts led to economic decline in the late 1880s and early 1890s. Smaller ranching and herding holdings developed after the decline and are the primary economic force in the area today.

TESTING PROCEDURES

The purpose of the testing program was to determine the nature, depth, and extent of possible cultural deposits existing within the proposed highway right-of-way. At all sites, testing operations followed general procedures used by the Office of Archaeological Studies. A primary datum was established for each site and north-south, east-west baselines were laid out with the use of a transit and stadia rod. Stakes were placed at 2 or 4 m intervals depending on size of the site along each baseline. A 1 by 1 m grid system was superimposed on each site. All surface artifacts and possible cultural features were marked with pin flags. Test pits, measuring 1 by 1 m, were then placed within the grid system at locations of high density or unusual artifacts, possible features, alignments or pit depressions, or areas of charcoal staining. Excavation in each pit continued until sterile soil was confirmed.

Artifacts within each test pit were collected in 10 cm levels and bagged by level. Surface areas around each test pit were collected. Diagnostic sherds, lithic artifacts, and ground stone on the sites were also collected by grid proveniences. Artifacts were also recovered from areas of backhoe disturbance prior to equipment use. Testing was conducted with the use of shovels, picks, trowels, and brushes. All soil was screened through ¼-inch mesh screen. Augers were used in each test pit if possible, to confirm the presence of sterile soil. Augering was also systematically used at 2 to 4 m intervals along site baselines to examine soils between test pits. Several flotation, pollen, and C-14 samples were taken for later analysis. Profiles were drawn when stratigraphic layering was visible and photographs taken of any cultural features encountered.

A site map was produced using the transit and stadia rod. Topographic variation, site elevations, drainages, test pit locations, site limits, and extent of the right-of-way were plotted on the maps. On sites not recommended for data recovery, artifacts were piece plotted and artifact and material type were recorded.

At six sites (LA 70203, 43788, 43785, 39979, 70190, and 75791) a backhoe was used to further test for the presence of possible subsurface cultural materials. These excavations proceeded in depth until sterile soil was reached. Upon completion of the testing, all pits and trenches were backfilled. After testing, all artifacts were assigned a Field Specimen Number by provenience. Lithic artifacts were analyzed in the laboratory by Anthony Martinez. The lithic data was then entered into a computer for which cross-tabulations were produced using an SPSS program. Ceramics were too few to be statistically manipulated; however, attributes that were monitored include vessel form, surface finish, and ceramic type. This analysis was completed by Sibel Melik. The few recovered ground stone artifacts were tabulated by type, material, and presence or absence of striations or shaping by Dorothy Zamora. All artifacts will be reexamined upon conclusion of the data recovery program when additional material will make detailed statistical analysis a more valid enterprise.

SITE DESCRIPTIONS

Site descriptions and evaluations are provided for each of the 21 sites examined during the testing program. Evaluations are also presented for two additional sites that were not tested, but are recommended for data recovery. The location of each site is shown on topographic maps in Appendix 1.

The relatively small sample size resulting from the testing program did not allow for complex statistical analyses. Consequently, artifact analysis consisted of the observation of several primary attributes on each artifact. The lithic analysis monitored material type, cortex, platform type, and flake termination. Only the basic data is present in the following site descriptions through cross-tabulations. The remaining data will be incorporated into the final report upon completion of the data recovery program. Ceramic analysis consisted of monitoring sherd type, form, and surface finish. Temper analysis, clay sourcing and other attributes will be studied upon completion of site excavations. Ground stone was recorded by material type, shape, artifact type, profile, condition, and type of striations.

Tested Sites

LA 37917 (Rocky Hill)

Site Type: Lithic artifact scatter.

Cultural Association: Middle to Late Archaic period.

Land Status: Gila National Forest.

Elevation: 2,036 m (6,680 ft).

Location: [redacted]

Description: The site occupies the crest of a high ridge in the foothills of the San Francisco Mountains (Fig. 2). Over 1,000 lithic artifacts cover the ridge, which extends on both sides of U.S. 180. There are definite areas of artifact concentrations on the ridge within the proposed highway construction zone.

The site measures well over 70 m north-south, extending into higher ridge land for at least a 200 m distance. It is 105 m east-west, encompassing 5,880 sq m. Approximately two-thirds of the documented limits lie within the proposed right-of-way and the additional temporary construction permit (TCP) area.

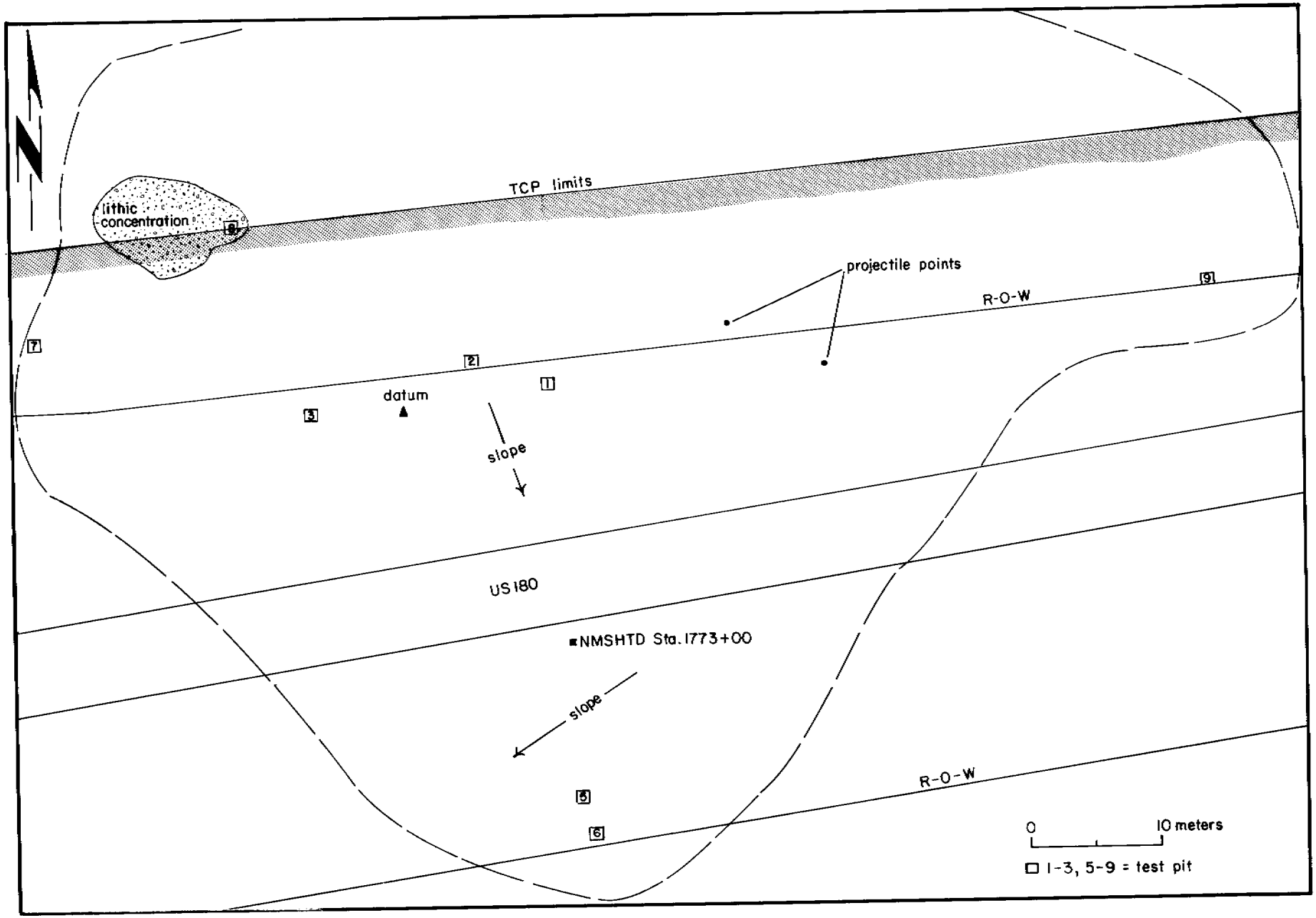

Figure 2. LA 37917, site plan.

Eight 1 by 1 m test pits were hand-excavated on the site. They extended from 20 to 40 cm (average of 33 cm) below the present ground surface. Auger tests were completed in each test pit to confirm the presence of sterile soil. A reddish brown to dark brown clay (Munsell color 7.5 YR 3/2 to 10 YR 5/3) is very dense and plastic and indicated the presence of sterile substrate. Soil above this reddish clay consists of a hard-packed sandy loam with gravels and cobbles often present.

Table 2. Lithic Artifacts, LA 37917

	Site Number 37917						
	Material Type						Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	basalt	rhyolite	
indeterminate flake fragment			1 100.0% 16.7%				1 100.0% 2.0%
core flake	15 42.9% 93.8%	4 11.4% 50.0%	5 14.3% 83.3%	7 20.0% 87.5%	3 8.6% 30.0%	1 2.9% 33.3%	35 100.0% 68.6%
biface flake				1 33.3% 12.5%	1 33.3% 10.0%	1 33.3% 33.3%	3 100.0% 5.9%
debris	1 20.0% 6.3%	4 80.0% 50.0%					5 100.0% 9.8%
uniface undiff.					1 100.0% 10.0%		1 100.0% 2.0%
biface undiff.					2 100.0% 20.0%		2 100.0% 3.9%
unident. corner-notched point					1 100.0% 10.0%		1 100.0% 2.0%
San Pedro point						1 100.0% 33.3%	1 100.0% 2.0%
San Augustin point					2 100.0% 20.0%		2 100.0% 3.9%
Column Total	16 31.4% 100.0%	8 15.7% 100.0%	6 11.8% 100.0%	8 15.7% 100.0%	10 19.6% 100.0%	3 5.9% 100.0%	51 100.0% 100.0%

Test Pits 1, 2, 6, and 8 yielded small amounts of charcoal flecking in the upper 20 cm. Two of these pits (6 and 8) may have compacted surfaces. In Test Pit 8, the compacted surface is at 16 cm below the ground surface. Rocks are lying on this surface and charcoal is embedded in it. There may be another surface at 25 cm bgs. Test Pit 6 has a surface at 27 cm depth with charcoal flecks and several cobbles lying on it. Both of these tests pits contained artifacts 20 to 30 cm in depth. Because of the limited nature of the testing, it is not possible to determine if these are pit floor surfaces or former utilized extramural surfaces.

A total of 51 lithic artifacts and 1 quartz crystal were collected from eight test pits and their surroundings at LA 37917. The predominate lithic material type is undifferentiated chert (Table 2). A high incidence of basalt and chalcedony is also noted. Four projectile points were recovered from the surface of the site. These include one fragmentary basalt corner-notched point of indeterminate affiliation, one rhyolite San Pedro point, and two basalt Augustin points. The San Pedro point dates from 3000 to about 1 B.C. and possibly later. The type has been found in Bat Cave and Ventana Cave and from central New Mexico to Chihuahua, Mexico (Dick 1965:30; Wills 1988a). The two basalt Augustin points date from 4500 to 4000 B.C. and are recognized as belonging to the Chiricahua stage of the Cochise Culture of western New Mexico and southeastern Arizona (Irwin-Williams 1979:40). These are also numerous in and near Bat Cave and from southern Texas to southern Arizona. Two basalt bifaces and one basalt uniface were also collected.

Evaluation: The presence of at least two possible charcoal-flecked surfaces on an undisturbed Middle to Late Archaic lithic camp site in the San Francisco Mountains foothills is of great interest archaeologically. The only other recorded Archaic site in the area of the Pine Lawn Valley is the Wet Leggett Site (Quimby 1949) for which a C-14 date of 2558 B.C. ± 680 was obtained. Because of the possibility of hearths, utilized surfaces, pits, and the potential for absolute dating for the portion of LA 39719 within the project limits, additional investigations are recommended.

LA 37918

Site Type: Lithic artifact scatter.

Cultural Association: Unknown.

Land Status: Gila National Forest.

Elevation: 2,024 m (6,640 ft).

Location: [redacted]

Description: This is an area of 90 lithic artifacts broadly scattered along a high ridge (Fig. 3), which is bisected by U.S. 180. On the north side of the highway, the former

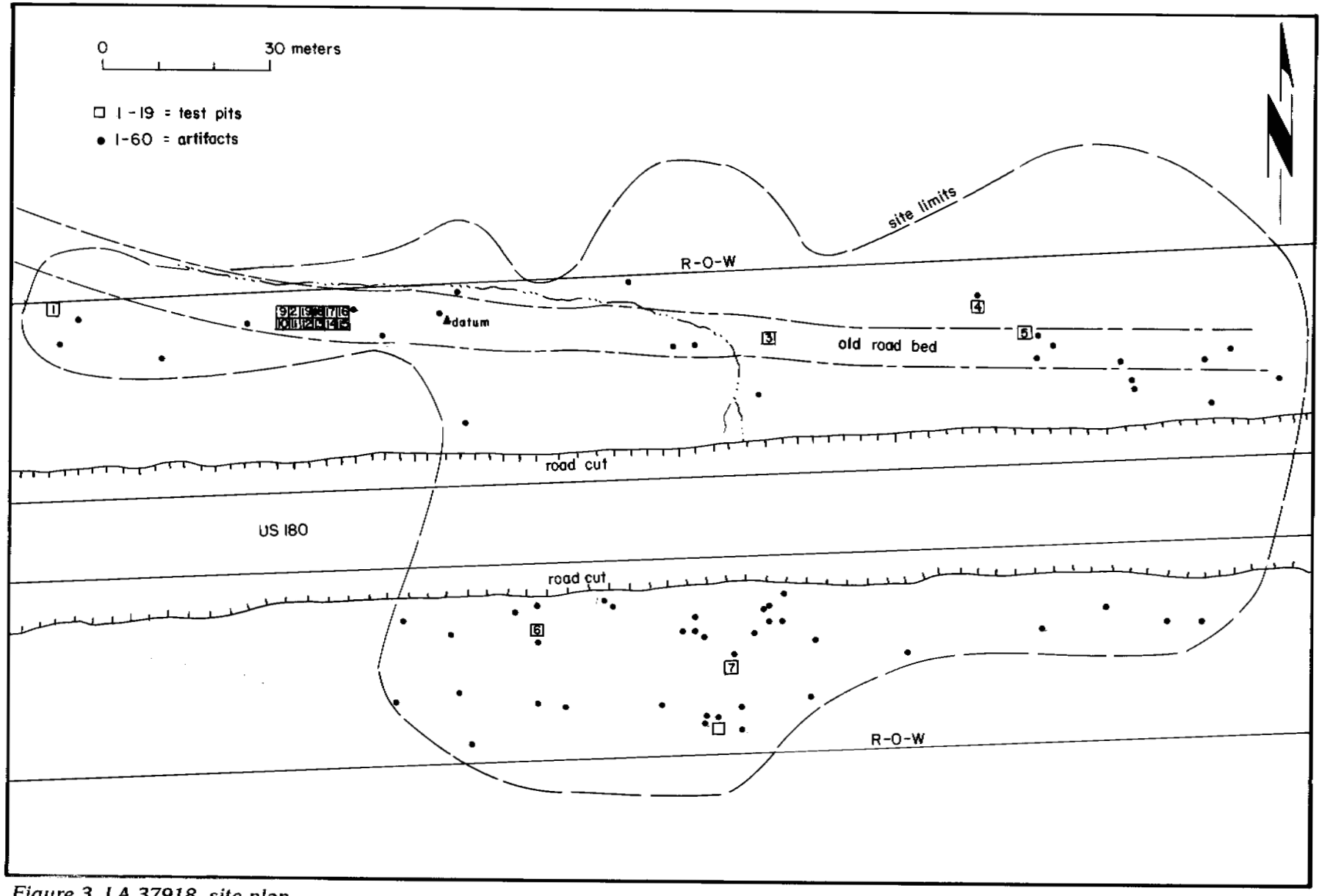

Figure 3. LA 37918, site plan.

dirt road to Luna crosses the site from east to west. Most artifacts are located in this road disturbance area or are eroding down the steep slope immediately south of the road. A small lithic artifact area is present on the south side of the road.

The site extends for 50 m north-south and for 95 m east-west, encompassing 3,550 sq m. Approximately 80 percent of the recorded site lies within the proposed right-of-way.

Nineteen 1 by 1 m test pits were placed within the right-of-way. Depths of the pits ranged from 5 to 35 cm with an average depth of 16 cm before confirmation of sterile soil. In most test pits, a reddish dark brown plastic clay indicated the presence of sterile substrate (Munsell color 7.5 YR 3/2). Only one artifact was recovered on the site at a depth below 10 cm--in Test Pit 7. On top of the ridge in Test Pits 1 and 9 to 19, a gray material was encountered directly below the surface. It is not ash and its exact nature is unknown. Cultural material did not seem to be specifically associated with this area, which was opened for complete evaluation.

Thirty lithic artifacts were collected from 19 tests pits on this site. Another 60 artifacts were piece-plotted and left on the site. The predominate material type is obsidian followed closely by chalcedony and chert (Table 3). The chalcedony has poor chipping qualities and occurs naturally in the foothills surrounding the site. Two chert and one quartzite core were also noted on LA 37918 that exhibit multidirectional flake scars. No diagnostic lithic artifacts, ceramics, or ground stone were seen on the site.

Table 3. Lithic Artifacts, LA 37918

	Site Number					
	37918					
	Material Type					Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	basalt	
core flake	3 15.0% 60.0%	5 25.0% 55.6%	1 5.0% 33.3%	10 50.0% 83.3%	1 5.0% 100.0%	20 100.0% 66.7%
utilized core flake				1 100.0% 8.3%		1 100.0% 3.3%
biface flake	1 33.3% 20.0%	1 33.3% 11.1%		1 33.3% 8.3%		3 100.0% 10.0%
debris		3 75.0% 33.3%	1 25.0% 33.3%			4 100.0% 13.3%
core	1 50.0% 20.0%		1 50.0% 33.3%			2 100.0% 6.7%
Column Total	5 16.7% 100.0%	9 30.0% 100.0%	3 10.0% 100.0%	12 40.0% 100.0%	1 3.3% 100.0%	30 100.0% 100.0%

Evaluation: The site has been disturbed by the dirt road running along the crest of the ridge. Test excavations indicate that this was a surface deposit of artifacts with no charcoal, pits, or any subsurface manifestations present. Because of the ground disturbance and surficial nature of the site, lack of diagnostics, and testing, it is unlikely that the site would yield further information on local prehistory. Therefore, no further work is recommended. The portions of the site outside of the project limits likewise do not have the potential to yield important information.

LA 37919

Site Type: Possible base camp.

Cultural Association: Late Archaic period.

Land Status: Gila National Forest.

Elevation: 1,987 m (6,520 ft).

Location: [redacted]

Description: The large lithic artifact scatter is located on almost level ground at the base of the San Francisco Mountain foothills (Fig. 4). U.S. 180 bisects the site, although most of the site lies on the north side of the highway. The large cobble area on the south side of U.S. 180 was tested for the presence of a cobble room block. However, the rocks seem to be piled as a result of roadbed clearing for the original highway. Artifacts may number 1,000. Included in this number are a handful of Alma Plain sherds which may represent an isolated pot drop or a possible later component.

The site extends for 65 m north-south by 75 m east-west for an area of 3,900 sq m. About 75 percent of the site lies within the proposed right-of-way.

Ten 1 by 1 m test pits were hand-excavated on the site. Soils range from 10 YR 3/3 (dark brown) to 10 YR 5/3 (brown) on the Munsell scale. Depths of the tests ranged from 4 cm below ground surface to 55 cm, with an average depth of 27 cm. In addition, 31 auger tests were placed systematically within the major artifact concentration and within each test pit where possible.

Test Pits 1 to 5 were placed within the possible cobble mound. No walls or surfaces were encountered. A few artifacts were found close to the highway at 20 cm depth, probably pushed there along with the large boulders next to the highway. In adjoining Test Pits 7 and 10, a burned charcoal and ash stain was evident at a depth of 6 to 10 cm. The extent of the stain was not explored further, but it is likely that it represents a hearth. Artifacts were recovered at this general depth within the entire

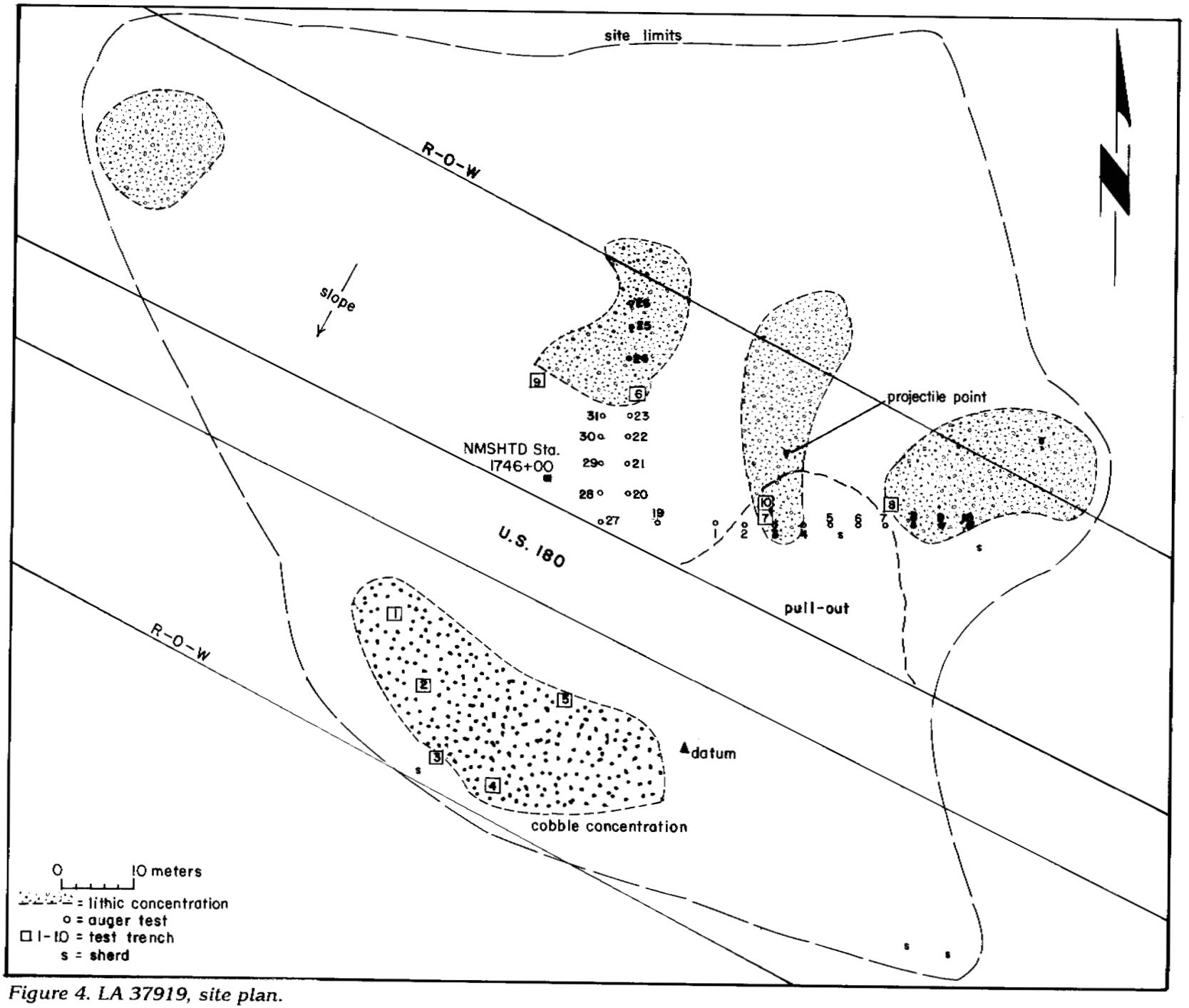

Figure 4. LA 37919, site plan.

site area. A total of 74 artifacts were collected from ten test pits at LA 37919. Seventy or 94.6 percent were lithic artifacts (Table 4). The large majority of artifacts, 65.7 percent, are undifferentiated chert. One broken biface, two biface flakes, and a San Jose-like point (short-barbed type) dates from 3500 to 2000 B.C. (Irwin-Williams 1973) and are generally associated with the Middle to Late Archaic period in northern and central New Mexico. Chapman (1985) has also recorded San Jose-type points on the Upper Gila River.

Table 4. Lithic Artifacts, LA 37919

	Site Number					
	37919					
	Material Type					Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	basalt	
core flake	39 69.6% 84.8%	5 8.9% 62.5%	6 10.7% 100.0%	2 3.6% 40.0%	4 7.1% 100.0%	56 100.0% 81.2%
biface flake	1 50.0% 2.2%			1 50.0% 20.0%		2 100.0% 2.9%
debris	4 44.4% 8.7%	3 33.3% 37.5%		2 22.2% 40.0%		9 100.0% 13.0%
core	1 100.0% 2.2%					1 100.0% 1.4%
biface undiff.	1 100.0% 2.2%					1 100.0% 1.4%
Column Total	46 66.7% 100.0%	8 11.6% 100.0%	6 8.7% 100.0%	5 7.2% 100.0%	4 5.8% 100.0%	69 100.0% 100.0%

Sherds were mostly recovered within and around the cobbles on the south side of the road. A few were present on the surface near the lithic scatter. No sherds were found below the surface in this area, however. Recovered sherds consist of 4 pieces of Alma Plain ware representing both bowl and jar fragments.

Evaluation: The site appears to be a Middle to Late Archaic camp site with a few Alma Plain sherds that represent a later use. There is the possibility of at least one subsurface hearth on the site. This type of site presents an unusual opportunity to establish comparisons with an earlier Archaic sites (LA 37917 and LA 70188) in the nearby mountain foothills and with later Mogollon sites in the area. It also may allow us to obtain much needed dates for the Archaic period in this part of New Mexico. Therefore, the portions of the site within the project limits are likely to yield important information on the prehistory of the region. Additional investigations are recommended within these limits.

LA 39975 (Lazy Meadows; Forest Service 372)

Site Type: Pithouse complex.

Cultural Association: Mogollon, Late Pinelawn phase, ca. A.D. 400.

Land Status: Gila National Forest.

Elevation: [redacted]

Description: The site occupies a low knoll that has been cut by US 180. Numerous ceramics and lithic artifacts extend over a wide area on the north side of the road. Only a few artifacts are present on the south side. A dirt track traverses the site from north to south. The site covers over 3,900 sq m (Fig. 5) and extends for 58 m north-south within the right-of-way and over 75m east-west. Approximately 70 percent of the site is within the proposed right-of-way.

Nine 1 by 1 m test pits were placed in areas of artifact concentrations or soil stains on the site. The tests ranged in depth from 20 to 50 cm below surface with a average depth of 33 cm. Soil color ranged from 5 YR 3/3 (reddish brown) to 5 YR 3/4 (dark reddish brown) on the Munsell chart. In general, the soil was extremely clayey and compacted. Auger tests were conducted at 21 locations on the site and within each completed test pit.

Portions of pits or pithouses were encountered in 6 of 9 test pits (Test Pits 1, 2, 4, 5, 7, and 8). Soil within these pits contained charcoal, sherds, lithic artifacts, an occasional piece of burned adobe, and ground stone. A possible posthole was located at 34 cm depth in Test Pit 4 near a mano resting on a surface. Surfaces in these pits were not prepared or plastered. They were constructed at the interface between

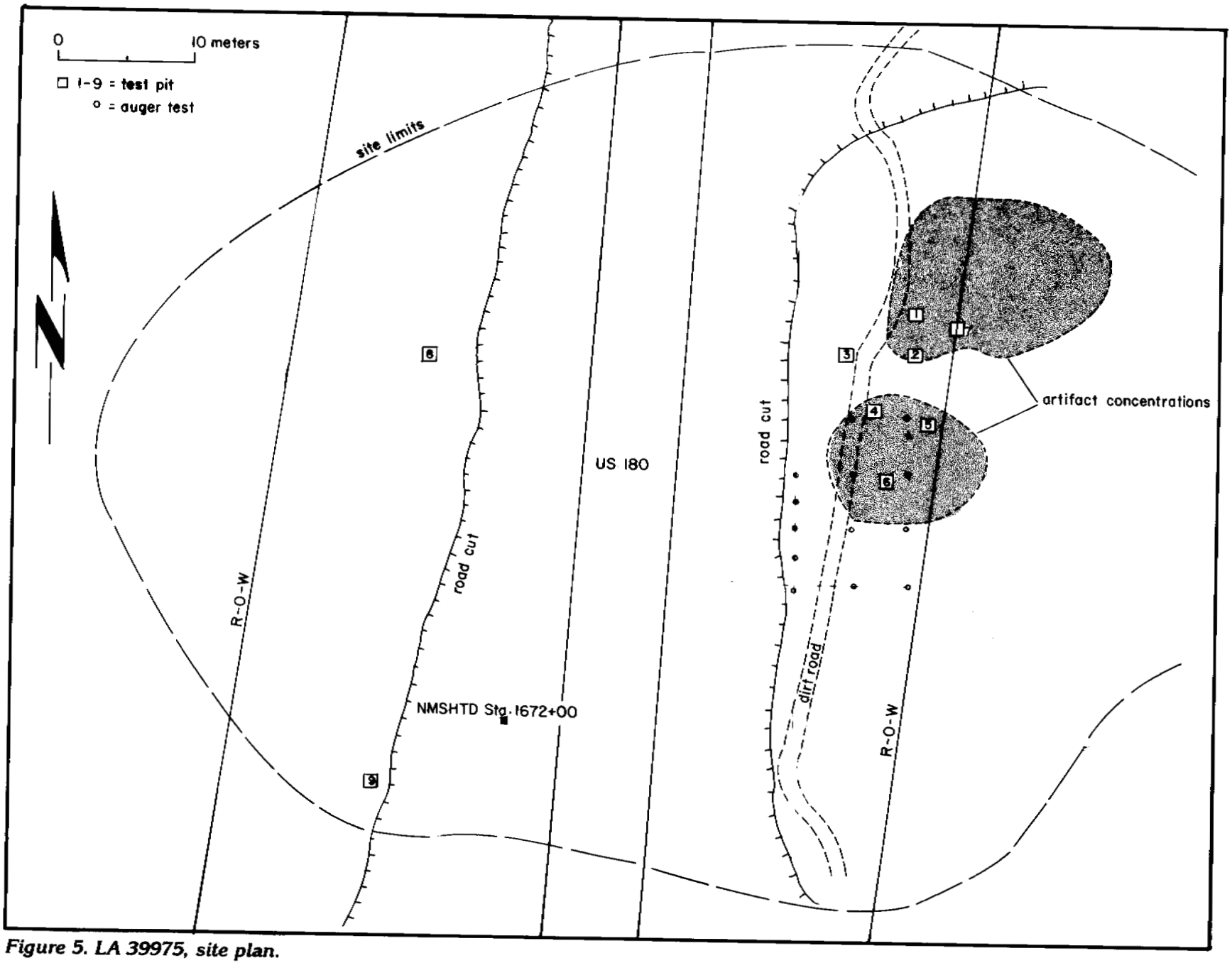

Figure 5. LA 39975, site plan.

Table 5. Lithic Artifacts, LA 39975

	Site Number								
	39975								
	Material Type								Site Number
	chert, undiff.	chalcedony	silicified wood, undiff.	quartzite, undiff.	quartzitic sandstone	obsidian, undiff.	basalt	rhyolite	39975
									Row Total
core flake	26 37.7% 83.9%	17 24.6% 60.7%	1 1.4% 100.0%	10 14.5% 76.9%	2 2.9% 100.0%	4 5.8% 80.0%	3 4.3% 60.0%	6 8.7% 100.0%	69 100.0% 75.8%
utilized core flake	1 33.3% 3.2%	1 33.3% 3.6%					1 33.3% 20.0%		3 100.0% 3.3%
biface flake	2 28.6% 6.5%	4 57.1% 14.3%		1 14.3% 7.7%					7 100.0% 7.7%
debris	2 22.2% 6.5%	6 66.7% 21.4%		1 11.1% 7.7%					9 100.0% 9.9%
core				1 100.0% 7.7%					1 100.0% 1.1%
biface undiff.						1 100.0% 20.0%			1 100.0% 1.1%
drill							1 100.0% 20.0%		1 100.0% 1.1%
Column Total	31 34.1% 100.0%	28 30.8% 100.0%	1 1.1% 100.0%	13 14.3% 100.0%	2 2.2% 100.0%	5 5.5% 100.0%	5 5.5% 100.0%	6 6.6% 100.0%	91 100.0% 100.0%

cultural and sterile soils. Depth of the pits ranged from 20 to 34 cm below ground surface. Five of the six pits cluster in a 63 sq m area on the east side of the highway. One shallow pit, 20 cm deep, lies on the west side of the highway and contained a few sherds and lithic artifact materials.

A total of 363 artifacts were collected from nine test pits and their immediate environs at LA 39975. Of these, 91 (25.1 percent) are lithic artifacts, 267 (73.5 percent) ceramics, 3 (.8 percent) are bone fragments, and 2 (.5 percent) ground stone. The lithic artifacts include one basalt drill, one obsidian biface (probably a projectile point), and one quartzite core (Table 5). Chert and chalcedony are the predominant material types. Of interest is the relatively high frequency of quartzite compared to obsidian and rhyolite. No diagnostic lithic materials were observed on the site.

The ceramic assemblage consists of 248 sherds of Alma Plain (one with a possible smudged or darkened exterior) and 19 sherds of San Francisco Red Ware. The presence of the redware suggests an A.D. 400 to A.D. 500 date within the Late Pinelawn phase of the Mogollon period.

The ground stone include a one-hand mano of granite with bidirectional striations and a fragmented slab metate of granite ground on both surfaces. Three small fragments of unidentified mammal long bones were recovered from Test Pit 7.

Evaluation: The site appears to represent an early Mogollon pithouse complex of the Late Pinelawn phase. Less than 1 km to the north is the SU Site, another Pinelawn phase site excavated by Martin (1940) and reexamined by Wills (1988a). The relationship of Lazy Meadows to the larger SU Site is of importance when examining settlement systems and economic ties between possible contemporary sites. If Lazy Meadows is a Late Pinelawn site dating to around A.D. 400, it is also important for examining the adoption of agriculture and the role such smaller sites may have had in that adaptive process. Therefore, portions of LA 39975 are likely to yield important information on the prehistory of the region and additional investigations are recommended for both sides of the right-of-way.

LA 39979 (Forest Service 376)

Site Type: Determined not to be a site.

Cultural Association: None.

Land Status: Gila National Forest.

Elevation: 1,969 m (6,460 ft).

Location: [redacted]

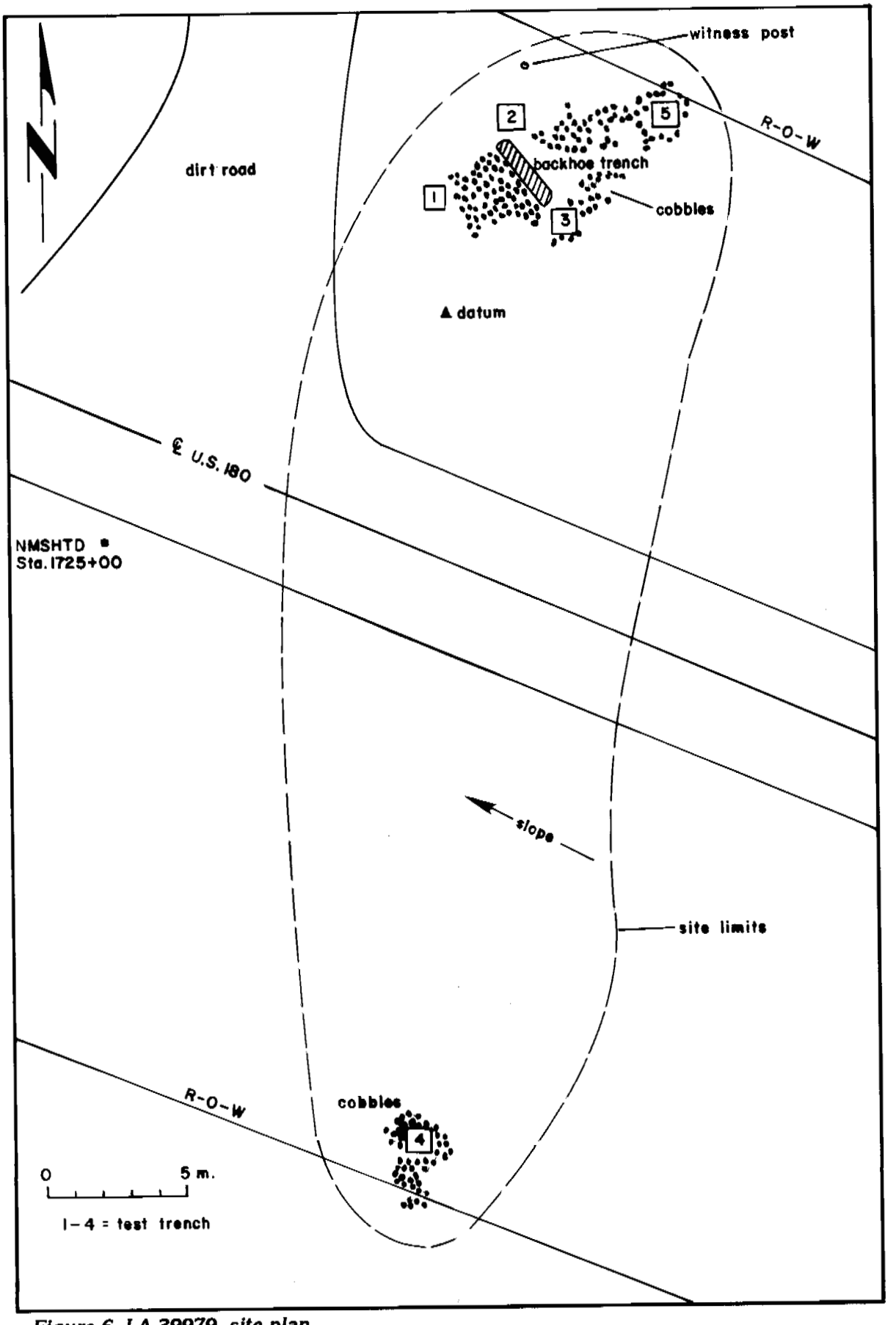

Figure 6. LA 39979, site plan.

Description: This was originally thought to represent a small Reserve phase cobble room block (Logan 1980). However, upon testing and subsequent backhoeing of the potential site, we determined that the remains were not archaeological. The presumed site consists of two small cobble piles of unmodified granite boulders on opposite sides of U.S. 180 within a heavy pine forest (Fig. 6). A large pine tree is growing within the larger of the mounds. Two flakes were noted approximately 20 m to the east of the site.

The north cobble area is 11 m east-west by 7 m north-south, encompassing 77 sq m. The south mound measures 3 m east-west by 5 m north-south (15 sq m). The total area is within the proposed right-of-way.

Five 1 by 1 m test pits were excavated into or on the edges of the mound. Depth of the pits varied from 24 to 50 cm below surface with an average depth of 36 cm. Soil color ranged from brown to dark brown (10 YR 3/3 - 5/3 on the Munsell chart). Upon completion of the hand-testing, a backhoe trench measuring 2.5 m by .68 m deep was placed through the center of the larger mound. Large boulders were mixed solidly throughout the fill. Sterile soil was observed at .68 cm depth.

Only one potential artifact was recovered from the testing and backhoe program--a piece of chalcedony angular debris which possibly is not even an artifact.

Evaluation: The site appears to have been produced by heavy equipment during construction of the original highway. The lack of artifacts and the nonaligned thick bed of boulders indicates that area should not be considered an archaeological site. Therefore, no further work is recommended.

LA 43785 (Rancho Grande Site; Forest Service 413)

Site Type: Sherd and lithic scatter.

Cultural Association: Mogollon period.

Land Status: Gila National Forest.

Elevation: 1,938 m (6,360 ft).

Location: [redacted]

Description: The site sits on a high ridge overlooking U.S. 180. Ceramics and lithic flakes are sparsely scattered along the ridge, concentrated slightly in one area (Fig. 7). A cobble mound, originally thought to be a room block, is located at the south end of the site.

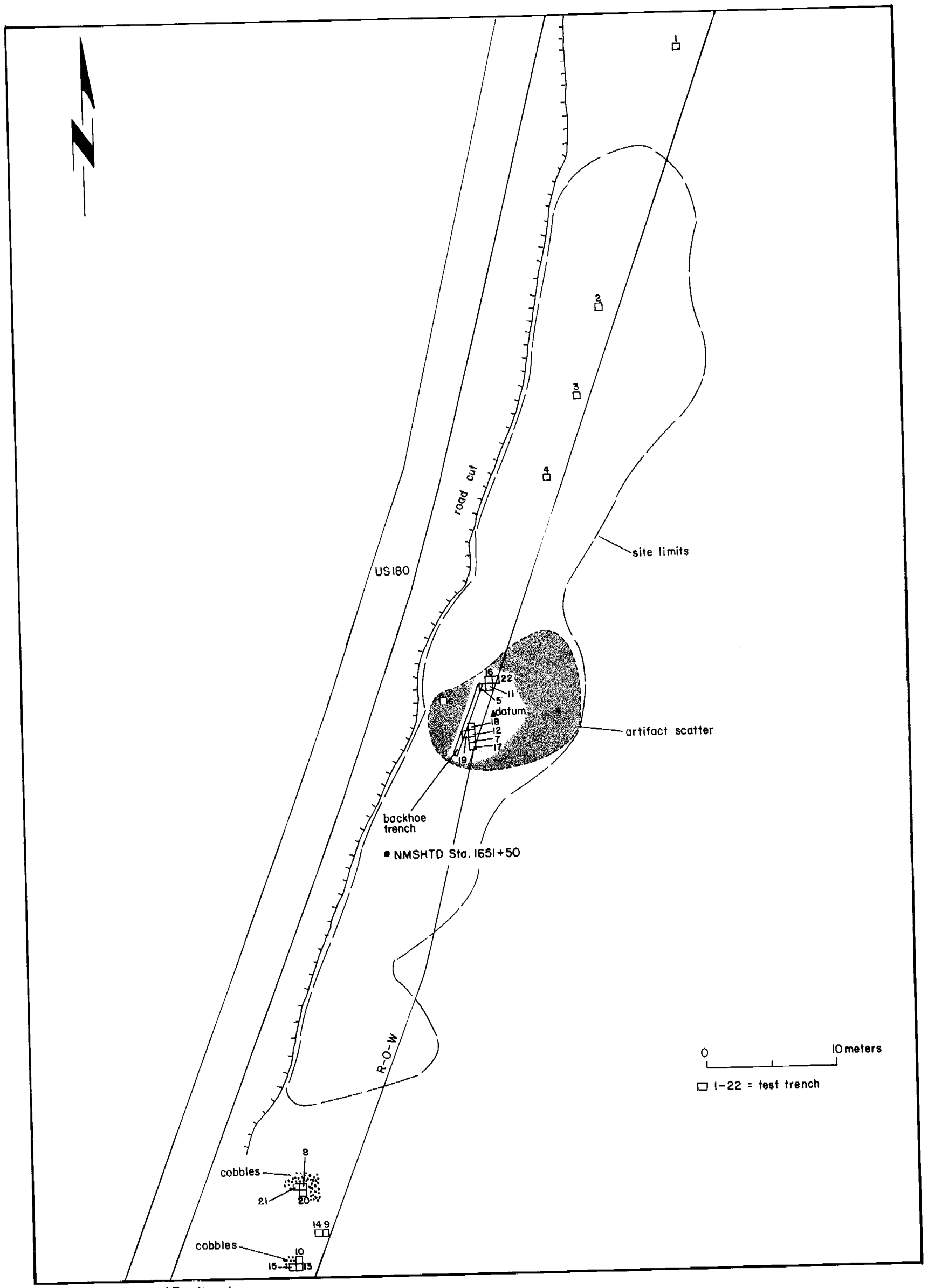

Figure 7. LA 43785, site plan.

The Rancho Grande site extends for 150 m north-south and 25 m east-west, encompassing 3,000 sq m. About 70 percent of the site is within the proposed right-of-way.

Twenty-two 1 by 1 m test pits were hand-excavated on the site. The soil lens was very shallow and excavations ranged from 5 to 35 cm below the surface before sterile soil or bedrock was reached. The average test pit was 11 cm deep. Soil color varied from reddish brown to brown/dark brown (5 YR 4/3 to 10 YR 4/3 on the Munsell scale). No artifact was uncovered at a depth greater than 10 cm below ground level. Auger tests were employed at the bottom of each test pit to ensure the presence of sterile soil.

Forty-one artifacts were collected from the 22 test units and a backhoe trench (Table 6). Lithic artifacts numbered 38 and include one basalt projectile point of possible Archaic affiliation. Chert and chalcedony are the predominant material types. Three sherds were also recovered, of which all are Alma Plain Brown Ware.

Table 6. Lithic Artifacts, LA 43785

	Site Number						
	43785						
	Material Type						Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	basalt	siltstone	
indeterminate flake fragment		2 100.0% 16.7%					2 100.0% 5.3%
core flake	10 35.7% 83.3%	5 17.9% 41.7%	3 10.7% 100.0%	9 32.1% 100.0%		1 3.6% 100.0%	28 100.0% 73.7%
biface flake	1 100.0% 8.3%						1 100.0% 2.6%
debris	1 16.7% 8.3%	5 83.3% 41.7%					6 100.0% 15.8%
unident. Archaic point					1 100.0% 100.0%		1 100.0% 2.6%
Column Total	12 31.6% 100.0%	12 31.6% 100.0%	3 7.9% 100.0%	9 23.7% 100.0%	1 2.6% 100.0%	1 2.6% 100.0%	38 100.0% 100.0%

The sherds were concentrated in a 16 by 10 m area in the middle of the site (Fig. 7). Test pits focused on this area after a possible surface with charcoal flecks was encountered at 7 cm in Test Pit 5. Attempts to follow the surface into Test Pits 11 and 15 resulted in finding only remnants of a thin surface. A shallow pit measuring 40 by 47 cm by 15 cm deep was located in Test Pit 6. Charcoal and unmodified rocks were in the pit and flotation and radiocarbon samples were taken. No artifacts were found in the pit or on the surrounding surface. Ten test pits were opened up in the area looking for further pits or surfaces. None were found. Upon completion of the hand excavations, a backhoe trench measuring 11.5 m was excavated through this area (Fig. 7). The trench reached a depth of 50 cm. The sterile substrate was located at 10 to 30 cm below the surface.

A cobble mound with an extending rock alignment is located at the southern end of the site. It was recorded by Nightengale (1980) as a possible cultural feature. A total of 8 test pits were placed in this area in order to determine the exact nature of the mound and alignment. The cobble alignment extended 4.4 m and Test Pits 9 and 14 were placed to profile this alignment. Rocks did not extend below the surface and no artifacts were recovered here. Three test pits in the possibly associated cobble pile produced no room alignments and cobbles were mixed throughout the soil to a depth of 20 cm. No artifacts were found, although small charcoal flecks occasionally appeared. A small rock pile south of this mound produced no alignments or surfaces. Two lithic artifacts were present in this area; no other cultural material was associated with the possible cobble feature.

Evaluation: While it does not seem that a cobble room is present at the south end of the site, sherds and lithics and the presence of a shallow pit indicates a probable temporary camp site during the Mogollon period. Through the testing program and backhoeing, we are confident no other cultural features lie within the proposed right-of-way. Therefore, we believe no further archaeological work within the right-of-way is necessary. However, because artifacts do extend beyond the right-of-way it is possible that pits or hearths may exist outside of the proposed construction zone that have the potential to yield important information on local prehistory.

LA 43786 (Slopeside Site; Forest Service 416)

Site Type: Cobble room block.

Cultural Association: Mogollon, Reserve phase, ca. A.D. 1000.

Land Status: Gila National Forest.

Elevation: 1,877m (6,160 ft).

Location: [redacted]

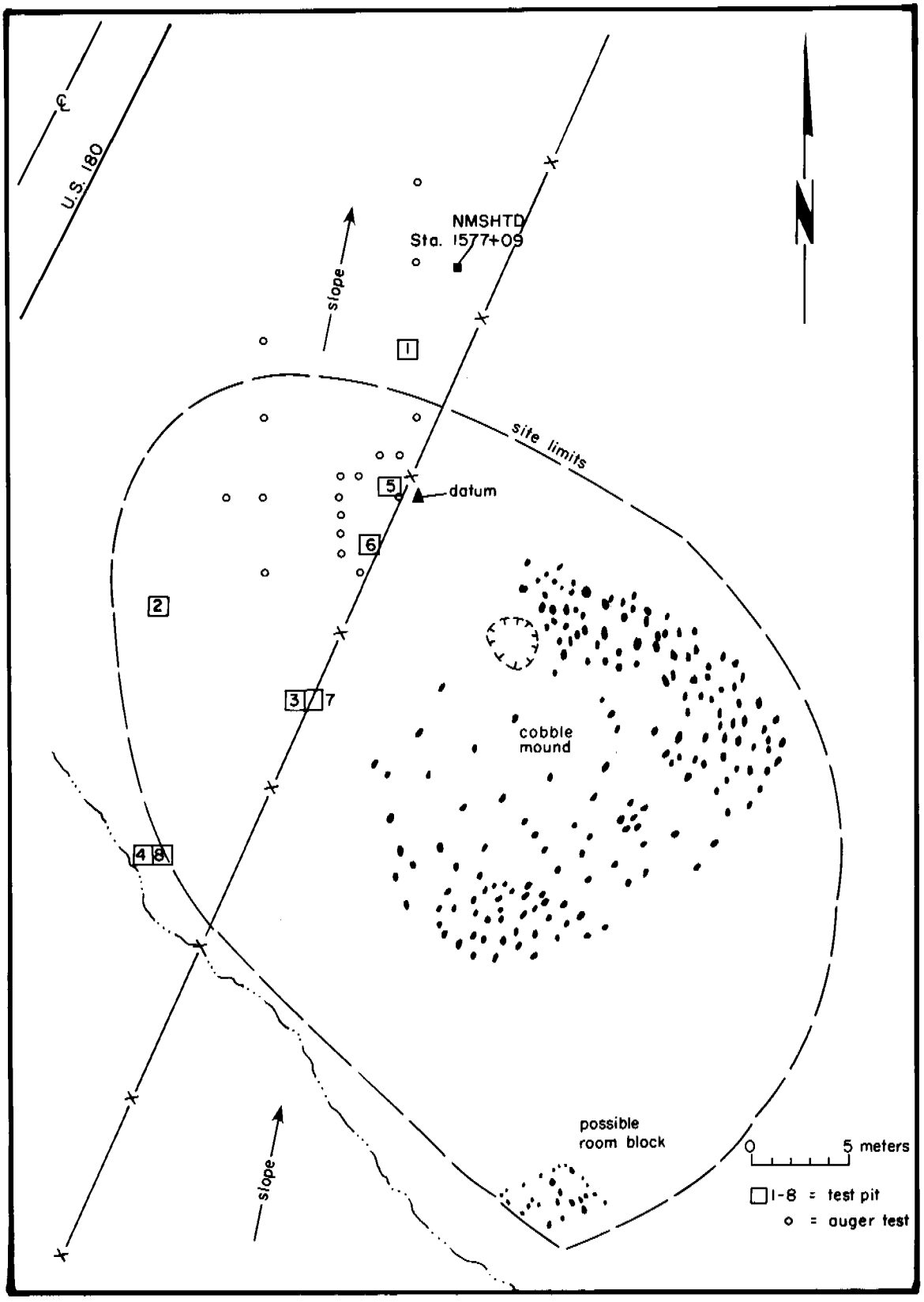

Figure 8. LA 43786, site plan.

Description: The site consists of a ten-room cobble room block on a projecting knoll overlooking South Leggett Creek (Fig. 8). The room block lies immediately outside of the proposed right-of-way; however, artifacts and burned soil extend into the right-of-way corridor.

Site size is 40 m north-south by 35 m east-west, encompassing 1,260 sq m. Approximately 25 percent of the site is within the highway construction zone.

Eight test pits were hand dug within the proposed right-of-way. Depths of excavations varied from 10 to 30 cm below ground surface with an average depth of 21 cm. Soil color ranged from dark brown to very dark brown (10YR 4/3 to 10YR 2/2 on the Munsell scale). Eighteen auger tests were placed in areas of darkened soil.

In Test Pit 3 and 7 an ashy lens appeared at a depth of 5 cm, directly overlying a hard-packed surface. The soil in Test Pit 6 at 7 to 10 cm contained charcoal flecks and three artifacts. Cobbles were also present at this level and possibly could be part of an alignment. Large cobbles were present at 10 cm depth in nearby Test Pit 5. Auger tests near Test Pits 5 and 6 produced a looser soil with flecks of charcoal to a depth of about 25 cm compared to a sticky brown clay away from this area. Tests Pits 1, 2, 4, and 8 contained no subsurface material or indications of cultural features.

Seventeen artifacts were collected from the eight test pits on the site. Of these nine are lithic debris with most material consisting of rhyolite (Table 7). Two loaf manos were observed on the site outside of the right-of-way. Collected ceramics consisted of seven Alma Plain Brown Wares and one unidentified white ware sherd.

Table 7. Lithic Artifacts, LA 43786

	Site Number			
	43786			
	Material Type			Row Total
	chert, undiff.	chalcedony	rhyolite	
core flake	2 25.0% 100.0%	1 12.5% 50.0%	5 62.5% 100.0%	8 100.0% 88.9%
debris		1 100.0% 50.0%		1 100.0% 11.1%
Column Total	2 22.2% 100.0%	2 22.2% 100.0%	5 55.6% 100.0%	9 100.0% 100.0%

Evaluation: The presence of charcoal-stained soil, utilized surfaces, and possible cobble alignments suggest that an activity area, adjacent to the room block, lies within the proposed highway right-of-way. Because of the very few number of small Reserve phase room blocks excavated within the Pine Lawn Valley, the study of outside living areas may provide important information on site function during this period. Therefore, the portion of the site within the project limits is likely to yield important information and additional investigations are recommended.

LA 43788 (Forest Service 284)

Site Type: Cobble room blocks.

Cultural Association: Mogollon, Reserve phase, ca. A.D. 1000.

Land Status: Gila National Forest.

Elevation: 1,877 m (6,160 ft).

Location: [redacted]

Description: This is a site on a high sloping ridge with several small room blocks and an extensive artifact scatter extending west across U.S. 180, which cuts the western edge of the site (Fig. 9). Site size is 145 m north-south by 90 m east-west, encompassing 9,700 sq m. About 50 percent of the site lies within the proposed right-of-way.

Eleven test pits were placed in areas of artifact concentrations on the crest of the ridge and in a low-lying area to the northwest. Depth of pits ranged from 10 to 40 cm with an average depth of 25 cm. Soil color varied from dark brown at the crest of the hill to very dark brown at the base (7.5 YR 3/4 to 10 YR 2/2 on the Munsell scale). In addition, 44 auger tests were placed systematically in artifact areas over the site and in the bottom of completed test pits. At the completions of the excavations, three backhoe trenches were placed on the site in areas of heaviest artifact concentrations. These measured 22 m long by . 95 m deep, 7.5 m long by .95 m deep, and 33.5 m long by 1.25 m deep. Only two sherds were found just below the surface in the first trench described.

Test pits produced no evidence of cultural features or any depth to this portion of the site. Occasional flecks of charcoal were all that was found. Artifacts did not extend below 10 cm depth.

Three hundred fifty-three primarily surface artifacts were collected during the testing program from the 11 test pits and three surface areas of backhoe trenching. These included 37 lithic artifacts, 305 ceramics, and 1 unidentified fragment of ground stone.

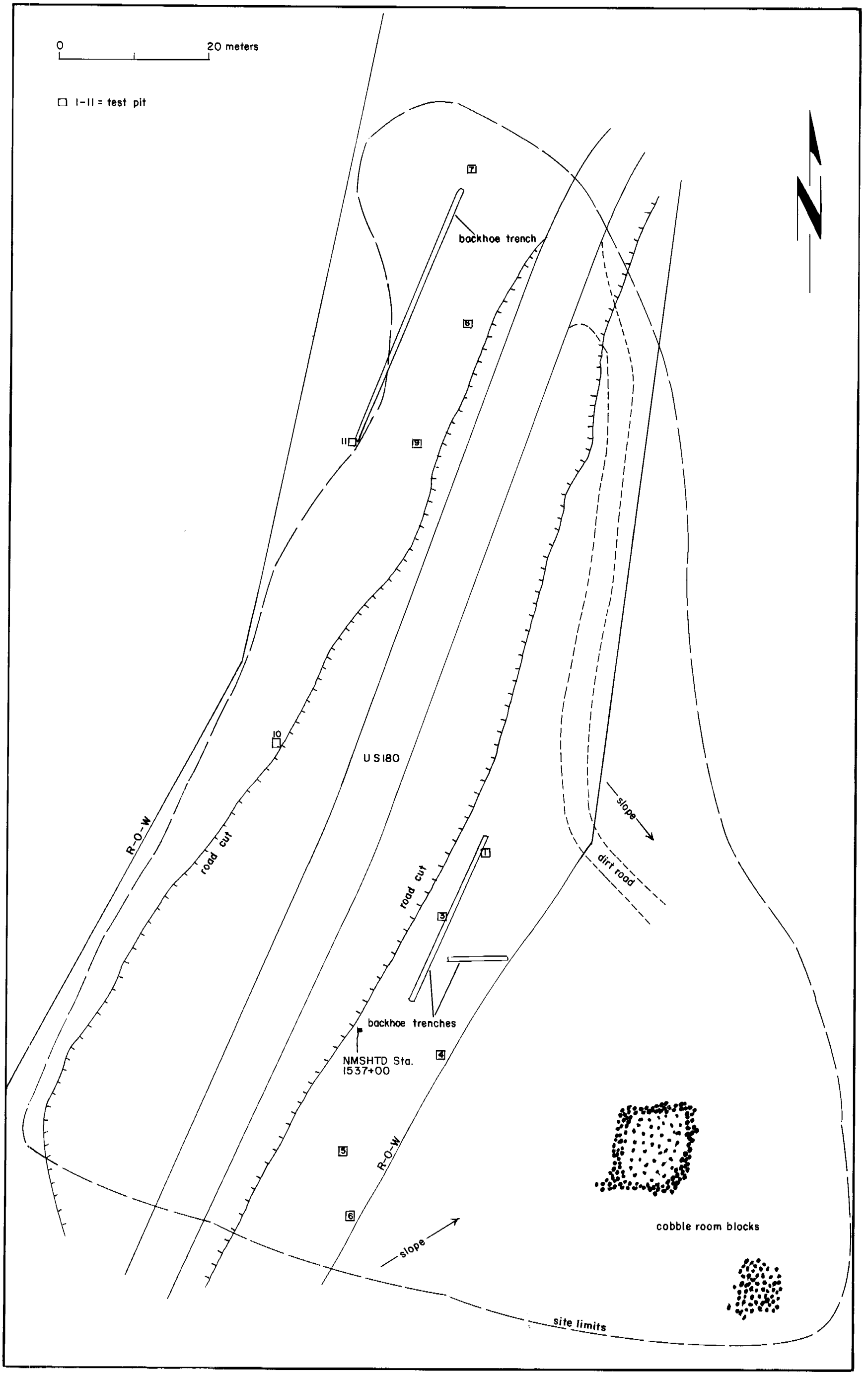

Figure 9. LA 43788, site plan.

Table 8. Lithic Artifacts, LA 43788

	Site Number					
	43788					
	Material Type					Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	rhyolite	
core flake						
	8	2	2	1	15	28
	28.6%	7.1%	7.1%	3.6%	53.6%	100.0%
	80.0%	40.0%	66.7%	50.0%	88.2%	75.7%
debris						
	2	3		1	1	7
	28.6%	42.9%		14.3%	14.3%	100.0%
	20.0%	60.0%		50.0%	5.9%	18.9%
core						
			1		1	2
			50.0%		50.0%	100.0%
			33.3%		5.9%	5.4%
Column Total	10	5	3	2	17	37
	27.0%	13.5%	8.1%	5.4%	45.9%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The lithic artifacts (Table 8) include one quartzite and one rhyolite core. Rhyolite is the predominate material type. Ceramics include 263 Alma Plain Wares, 3 smudged bowls, 8 San Francisco Red Wares, 1 Three Circle Red-on-white, 3 Reserve Black-on-white, 23 corrugated, 2 incised, and 2 possible Tularosa patterned corrugated sherds. The single piece of ground stone is made of basalt and is too small to categorize. A slab metate was observed on the site outside of the right-of-way.

Evaluation: The largest of the cobble mounds sits 22 m outside of the proposed right-of-way. Because of the extensive artifact scatter, we thought that activity areas might be located within the proposed highway corridor. This proved not to be the case, as sterile soil occurred from 10 to 30 cm in depth with few subsurface artifacts. Therefore, because the portion of the site is not likely to yield further information beyond what has been recorded, no additional investigations are recommended. The portion of the site outside of the projects limits, however, does have the potential to yield important information on local prehistory.

LA 70188

Site Type: Camp site.

Cultural Association: Middle to Late Archaic period.

Land Status: Gila National Forest.

Elevation: 2,048 m (6,720 ft).

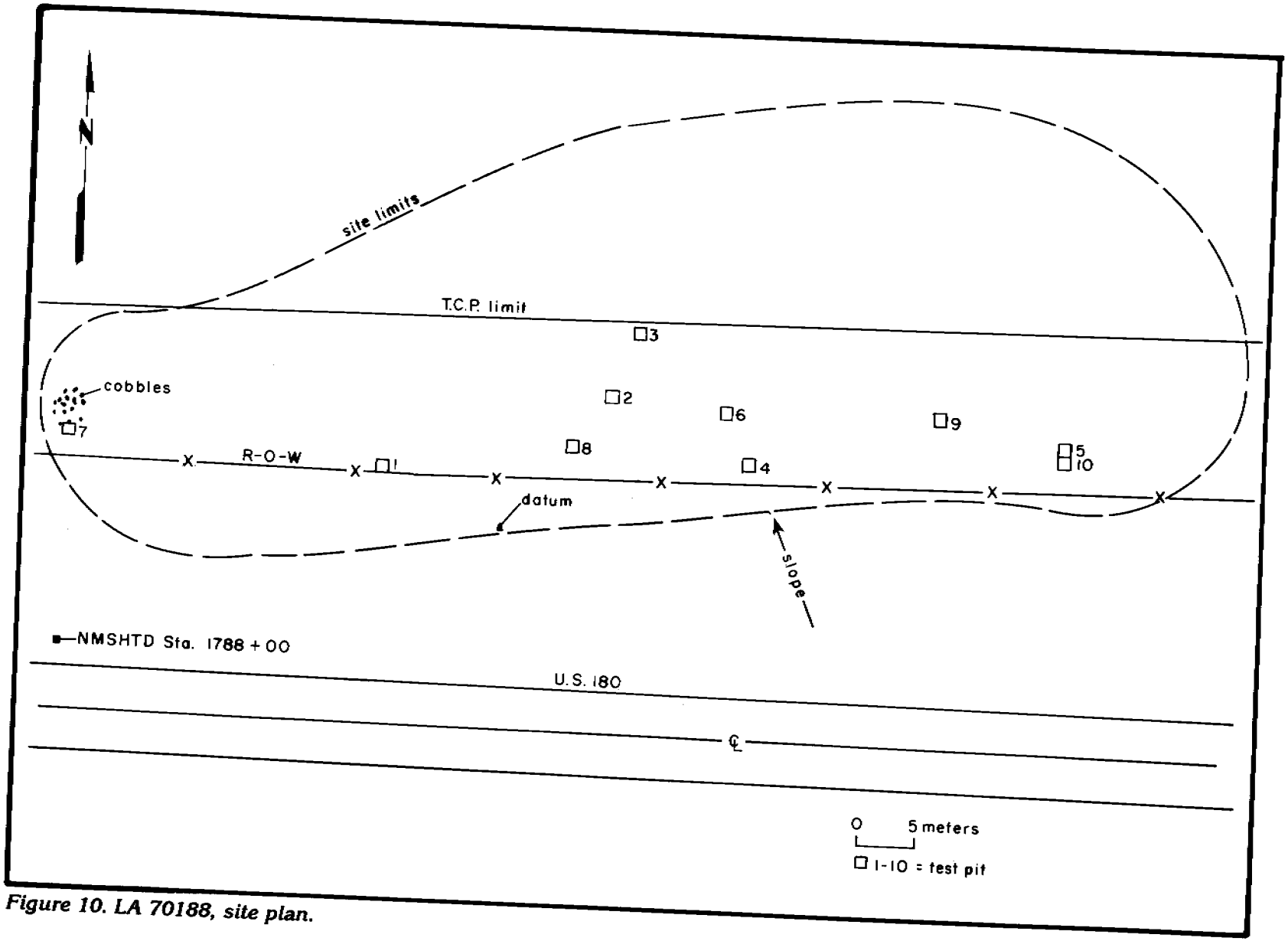

Figure 10. LA 70188, site plan.

Location: [redacted]

Description: This is an extensive artifact scatter on top of a high ridge in the foothills of the San Francisco Mountains (Fig. 10). Artifacts may number 1,000 and include lithic items, ground stone, and a small number of isolated Alma Plain and corrugated sherds. These may represent a minor, later Mogollon occupation of the site.

The site extends for over 100 m north-south, continuing upslope into the heavily wooded hills, and 95 m east-west, encompassing at least 10,000 sq m. Approximately 25 percent of the site is within the proposed right-of-way.

Ten 1 by 1 m test pits were hand-excavated on the site. Depth of the tests ranged from 5 cm to 30 cm with an average depth of 25 cm. Soil color varied from brown to dark reddish brown (7.5 YR 4/2 to 5 YR 3/3 on the Munsell scale). Each test pit was also augered upon completion of the excavations to ensure that sterile soil was reached.

Test Pit 5 was placed in a lithic artifact concentration that also included an Archaic Pelona-like projectile point. Immediately upon removing the 4 to 5 cm of loose topsoil, a burned stain with charcoal measuring 50 by 38 cm was visible. Several lithic flakes and small pieces of calcined bone were also present. Excavation proved the stain to be half of a small pit, 60 cm in diameter and 22 cm deep. Charcoal and bone, and a few rocks continued into the fill of the pit. A carbon-14 sample was taken. Adjacent to the pit and extending into Test Pit 6, a hard-packed surface was uncovered at 5 cm in depth. On this surface was an ash stain 40 cm in diameter. Bone fragments were present in the ash. Test Pit 9, 9 m to the northwest also encountered charcoal at a shallow depth.

In Test Pit 6, 11 lithic artifacts were recovered from 1 to 10 cm in depth and 15 from 10 to 25 cm. A sloping surface was encountered at 16 to 20 cm depth suggesting the presence of a pit. The surface was not prepared, but rather occurred on the interface between cultural fill and sterile, plastic clay.

Test Pit 7 was placed in a small concentration of basalt cobbles on the west end of the site. No cultural features and only 1 lithic flake were present.

A total of 88 artifacts were collected from the ten test pits on the site. Eighty-four are lithic artifacts including two Pelona-like projectile point types often affiliated with Middle to Late Archaic sites (Moore 1988:42). One chert biface and a basalt scraper were present on the site. The predominant material types are chalcedony and chert (Table 9). A single one-hand mano of granite was recovered on the site. There were four sherds collected from surface locales. These consist of three Alma Plain Brown Wares and one corrugated sherd.

Table 9. Lithic Artifacts, LA 70188

	Site Number						
	70188						
	Material Type						Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	basalt	rhyolite	
core flake	18 34.0% 60.0%	19 35.8% 55.9%	3 5.7% 100.0%	8 15.1% 80.0%	2 3.8% 50.0%	3 5.7% 100.0%	53 100.0% 63.1%
utilized core flake				1 100.0% 10.0%			1 100.0% 1.2%
biface flake		1 50.0% 2.9%		1 50.0% 10.0%			2 100.0% 2.4%
debris	9 39.1% 30.0%	14 60.9% 41.2%					23 100.0% 27.4%
notching flake	1 100.0% 3.3%						1 100.0% 1.2%
scraper					1 100.0% 25.0%		1 100.0% 1.2%
biface undiff.	1 100.0% 3.3%						1 100.0% 1.2%
unident. Archaic point	1 50.0% 3.3%				1 50.0% 25.0%		2 100.0% 2.4%
Column Total	30 35.7% 100.0%	34 40.5% 100.0%	3 3.6% 100.0%	10 11.9% 100.0%	4 4.8% 100.0%	3 3.6% 100.0%	84 100.0% 100.0%

Evaluation: LA 70188 contains at least two shallow pits with datable charcoal and ground stone. The projectile points suggest this is a Middle to Late Archaic period camp site with a minor Mogollon component. If this is an accurate temporal assessment of the site, the presence of datable cultural features and ground stone is very important for understanding Archaic adaptations in this region of New Mexico. Therfore, the portion of the site within the project limits is likely to yield important information on the prehistory of the region. Additional investigations are recommended.

LA 70189

Site Type: Small cobble room block.

Cultural Association: Mogollon, Reserve phase, ca. 1000 A.D.

Land Status: Gila National Forest.

Elevation: 1,987 m (6,520 ft).

Location: [redacted]

Description: The site consists of a small four to six room cobble room block with an associated activity area that extends into the proposed highway right-of-way (Fig. 11). Sherds and lithic artifacts are fairly numerous.

The site measures 38 m north-south by 30 m east-west, encompassing 1,140 sq m. About 35 percent of the site is within the right-of-way.

Four 1 by 1 m test pits were placed within the proposed highway corridor. Excavation depths ranged from 10 to 26 cm and averaged 14 cm. Soil color was generally a brown/dark brown (7.5 YR 4/4 on the Munsell scale).

In Test Pit 1, a utilized surface was encountered at 10 cm below ground surface. On this surface a charcoal flecked pit sloping down for at least 6 cm to the northeast was encountered. Several sherds were within this area.

In nearby Test Pit 2, a surface was also encountered at 10 cm. It has been oxidized to a bright red. Along the south edge of the test unit, a possible posthole was noted that measured 12 by 11 cm, such as for a ramada. The utilized surface extended into Test Pit 4.

The findings in Test Pit 3 were difficult to interpret. Cultural fill extended to 26 cm below surface and we may have encountered a pit although no walls or edges were observed.

Eighty-eight artifacts were collected from the four test pits and their immediate environs. Thirty-four of these were lithic artifacts consisting mostly of flakes. Predominant materials are chalcedony and chert (Table 10). A total of 53 ceramics were recovered. They include 36 Alma Plain B Brown Wares, 5 smudged interior brown ware bowls, 1 Reserve Black-on-white, 8 corrugated, 1 Alma Punched, 1 Alma Incised and Neckbanded, and 1 white ware sherd. An oval one-hand granite mano was gathered from the site surface.

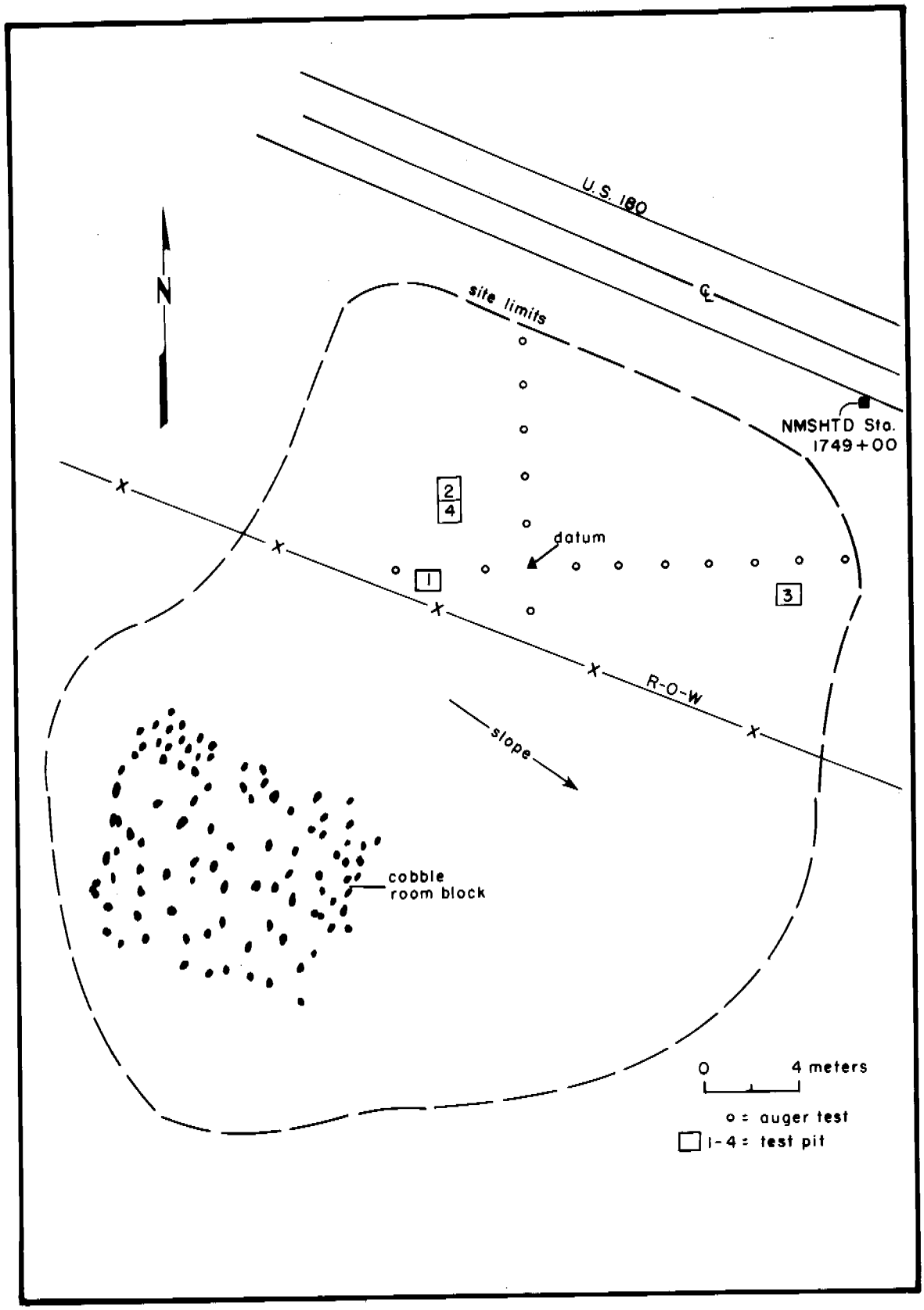

Figure 11. LA 70189, site plan.

Table 10. Lithic Artifacts, LA 70189

	Site Number						
	70189						
	Material Type						Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	basalt	rhyolite	
core flake	9 29.0% 90.0%	12 38.7% 85.7%	5 16.1% 100.0%	2 6.5% 100.0%	2 6.5% 100.0%	1 3.2% 100.0%	31 100.0% 91.2%
biface flake		1 100.0% 7.1%					1 100.0% 2.9%
debris	1 50.0% 10.0%	1 50.0% 7.1%					2 100.0% 5.9%
Column Total	10 29.4% 100.0%	14 41.2% 100.0%	5 14.7% 100.0%	2 5.9% 100.0%	2 5.9% 100.0%	1 2.9% 100.0%	34 100.0% 100.0%

Evaluation: The site area within the proposed highway right-of-way contains reddened surfaces with at least one pit and a possible posthole for a ramadalike structure. Numerous artifacts are also present. Because of the presence of these cultural features, the site is important for its potential to examine often-ignored activity area data that may provide information on site activities and economic organization for the Reserve phase. Therefore, additional investigations are recommended.

LA 70190

Site Type: Sherd and lithic artifact scatter.

Cultural Association: Mogollon period.

Land Status: Gila National Forest.

Elevation: 1,987 m (6,520 ft).

Location: [redacted]

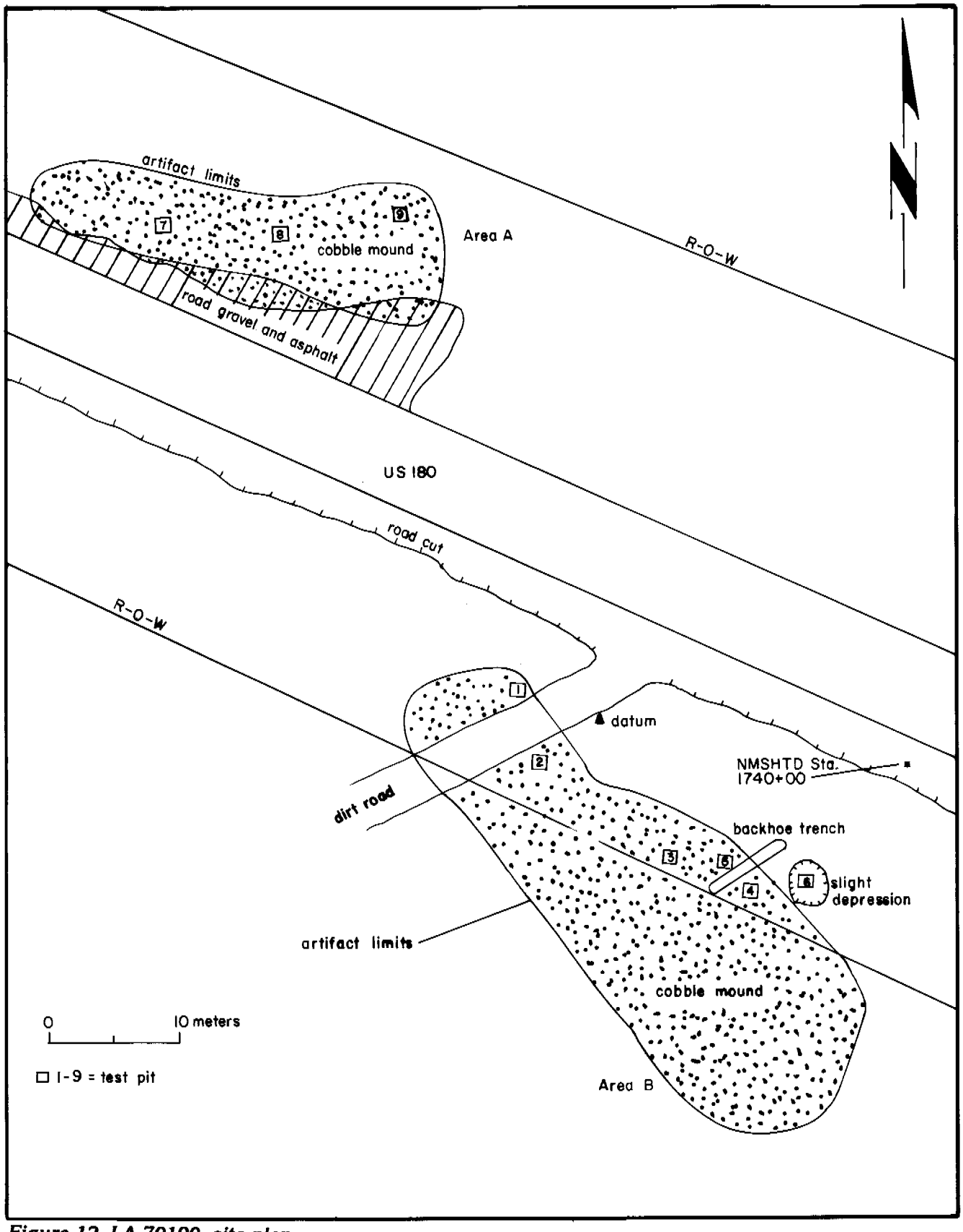

Figure 12. LA 70190, site plan.

Description: The site was initially recorded as a possible cobble room block because of an extensive area of cobbles within the proposed highway right-of-way (Oakes 1989:46). The mound measures 42 by 15 sq m (Fig. 12). A possible metate fragment was also present on the surface. During the testing program, an artifact scatter was observed across U.S. 180. The testing program also examined this scatter.

A total of 58 artifacts were collected from the nine test pits at LA 70190, 20 were lithic artifacts (Table 11). Over half of these are of obsidian. There were 45 ceramics on the site including a partial bowl of Reserve Smudged (30 sherds). Other ceramics include 12 sherds of Alma Plain, 2 Reserve Black-on-white sherds, and 1 unidentified white ware sherd.

Six test pits were excavated into the cobble mound area and three in the sherd and lithic artifact scatter. Within the cobble area, excavations reached depths of 30 to 65 cm, removing many cobbles in the process. Soil color was a weak red (10YR 4/2 on the Munsell scale). A partial bowl was recovered in Test Pit 4 at 20 cm in depth beneath a very large, almost immovable, boulder. Several lithic artifacts were recovered at this general depth within the mound. The presumed metate observed on the survey proved not to be an artifact. However, large rocks and boulders were ubiquitous throughout the test units but no alignments were present. Upon completion of the testing, a 6.5 m long backhoe trench reaching 1.20 m in depth was placed in the area of the partial bowl. Rocks uncovered were very large and mixed and no artifacts were found. We believe that the cobble mound resulted from materials pushed to the side of the road during original construction of the highway. The artifacts, including the bowl, may have been part of a site that once existed in the highway path.

Table 11. Lithic Artifacts, LA 70190

	Site Number				
	70190				
	Material Type				Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	
core flake	3 18.8% 75.0%	1 6.3% 33.3%	2 12.5% 100.0%	10 62.5% 90.9%	16 100.0% 80.0%
biface flake				1 100.0% 9.1%	1 100.0% 5.0%
debris	1 33.3% 25.0%	2 66.7% 66.7%			3 100.0% 15.0%
Column Total	4 20.0% 100.0%	3 15.0% 100.0%	2 10.0% 100.0%	11 55.0% 100.0%	20 100.0% 100.0%

Across U.S. 180 to the north, a small sherd and lithic artifact scatter may once have been part of the site that was disturbed by the original highway construction. Three test pits were excavated into this area. Test pits were excavated to depths of 30 to 40 cm with the average being 33 cm. Soil color was generally reddish brown (5YR 4/4 on the Munsell scale). Nine auger tests were also placed in this area. No indication of subsurface features was present on this portion of the site. Also, in this area, artifacts were more numerous closer to the highway, suggesting that they may be secondary deposits similar to the bowl and other artifacts across the highway.

Evaluation: Testing and backhoe trenching at LA 70190 failed to yield any evidence of subsurface deposits. We believe that the site represents a secondary artifact deposit occurring as a result of the movement of cobbles and artifacts by heavy equipment from the original highway bed. Therefore, no further archaeological work is recommended.

LA 70191

Site Type: Possible pithouse unit.

Cultural Association: Mogollon, possibly Pinelawn phase, ca. A.D. 200.

Land Status: Gila National Forest.

Elevation: 1,981 m (6,500 ft).

Location: [redacted]

Description: The site appears as a small lithic and sherd artifact scatter on almost level lands adjacent to U.S. 180 (Fig. 13). It was originally thought (Oakes 1989) that a small cobble mound, outside of the right-of-way, was associated with the scatter. Reexamination during testing revealed that the mound was a result of clearing a nearby drainage channel.

The small site measures 11.5 m north-south by 11 m east-west, encompassing 100 sq m. The complete site lies within the proposed highway right-of-way.

Two test pits were placed within the site area. They were excavated to depths of 40 and 73 cm each. Soil color was 10 YR 4/3 (brown/dark brown on the Munsell scale). Four auger tests were also placed within the site limits. Test Pit 1 contained artifacts and charcoal flecks throughout. At 25 cm depth, an ashy matrix was evident surrounding what may be the top of an adobe wall 12 cm wide. The possible wall slopes to the north while curving to the northeast. Soil varied slightly inside the feature. This may indicate the presence of a pithouse.

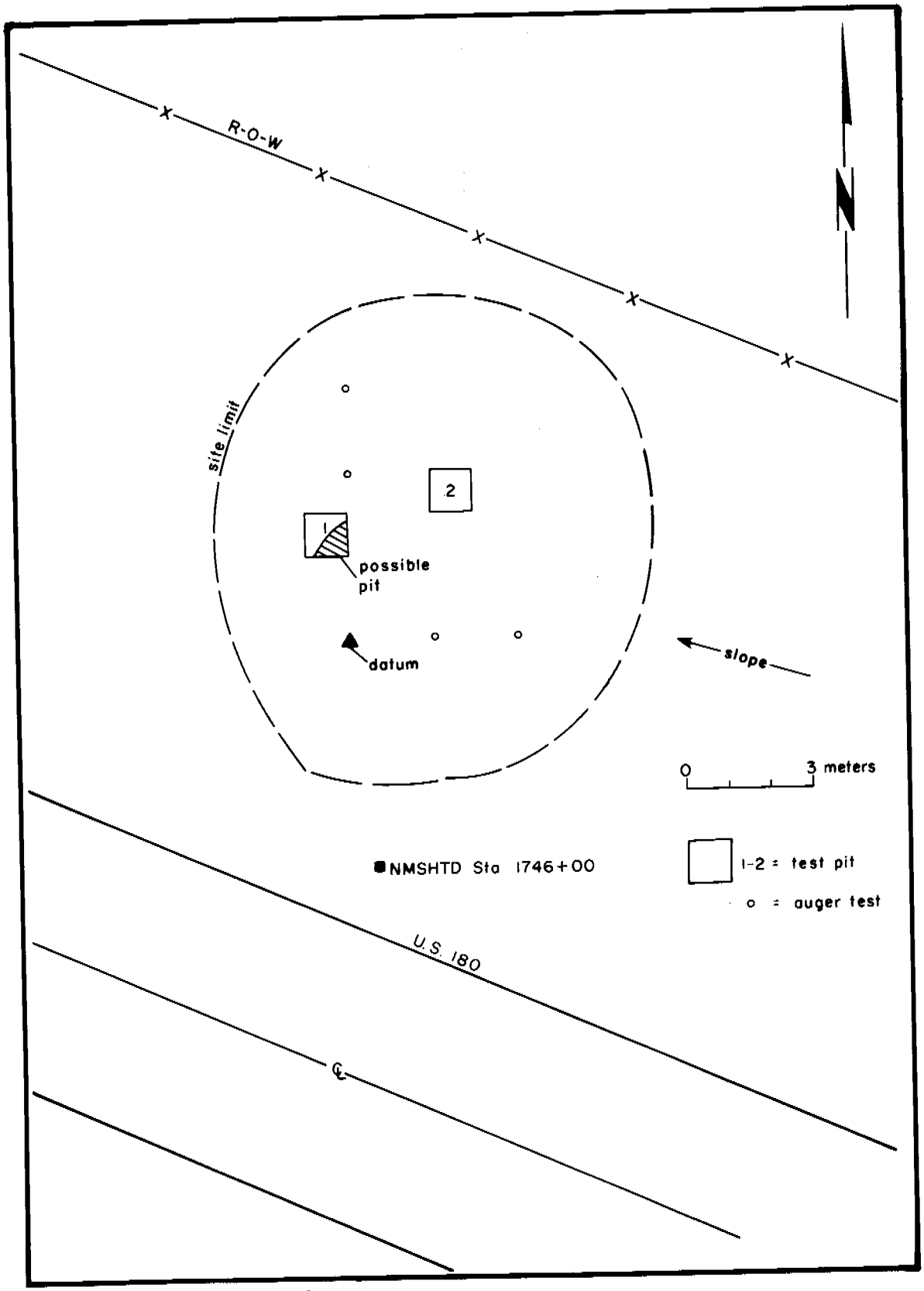

Figure 13. LA 70191, site plan.

Test Pit 2 also contained charcoal and lithic artifacts. Root disturbance was prevalent. Charcoal stopped at 40 cm and then picked up again between 55 and 60 cm. No walls or structural features were uncovered. The presence of charcoal and artifacts at the above depth does, however, suggest some type of cultural activity.

Twenty-three artifacts were recovered from two test pits and their surrounding areas at LA 70191. Of these, 22 are lithic artifacts consisting primarily of chert and obsidian (Table 12). One San Pedro projectile point, dating between 3000 and 2000 B.C. (Wills 1988a:76), was collected from the surface. The one ceramic sherd was found near Test Pit 1 and is an Alma Plain Brown Ware jar sherd.

Evaluation: Based on the depth of cultural fill and the presence of a possible curving adobe wall, this site may contain a pithouse of the Pinelawn phase. Pithouses of this early period are important for their ability to inform on subsistence strategies and to understand the shift from foraging to agriculture. The site is likely to yield important information on the prehistory of the region and additional investigations are recommended.

Table 12. Lithic Artifacts, LA 70191

	Site Number					
	70191					
	Material Type					Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	obsidian, undiff.	siltstone	
core flake	9 50.0% 81.8%	1 5.6% 100.0%	2 11.1% 100.0%	5 27.8% 71.4%	1 5.6% 100.0%	18 100.0% 81.8%
biface flake				1 100.0% 14.3%		1 100.0% 4.5%
debris	2 100.0% 18.2%					2 100.0% 9.1%
San Pedro point				1 100.0% 14.3%		1 100.0% 4.5%
Column Total	11 50.0% 100.0%	1 4.5% 100.0%	2 9.1% 100.0%	7 31.8% 100.0%	1 4.5% 100.0%	22 100.0% 100.0%

LA 70192

Site Type: Lithic artifact scatter.

Cultural Association: Mogollon period.

Land Status: Gila National Forest.

Elevation: 1,981 m (6,500 ft).

Location: The site sits on an almost level area within the Gila National Forest adjacent to U.S. 180 (Fig. 14). It is a small, concentrated lithic artifact scatter. One sherd was found on the surface and may be associated with nearby ceramic sites.

The site size is 11 m north-south by 12 m east-west, encompassing 120 sq m. Twenty-five percent of the site is within the proposed right-of-way.

Two test pits and 11 auger tests were placed within the right-of-way and excavated to 30 and 31 cm in depth. Soil color in Test Pit 1, outside of the artifact scatter, was dark yellowish brown while in Test Pit 2 it was very dark grayish brown (10 YR 3/4 and 10 YR 3/2 on the Munsell chart). Test Pit 1 contained numerous unaligned rocks and only one artifact directly below the surface. Test Pit 2 was within a dense scatter of small flakes. Several lithic artifacts were recovered 10 cm in depth. A few flecks of charcoal were also present.

Table 13. Lithic Artifacts, LA 70192

	Site Number				
	70192				
	Material Type				Row Total
	chert, undiff.	chalcedony	obsidian, undiff.	limestone	
core flake	21 58.3% 84.0%	3 8.3% 50.0%	11 30.6% 84.6%	1 2.8% 100.0%	36 100.0% 80.0%
utilized core flake			1 100.0% 7.7%		1 100.0% 2.2%
biface flake	1 50.0% 4.0%		1 50.0% 7.7%		2 100.0% 4.4%
debris	2 40.0% 8.0%	3 60.0% 50.0%			5 100.0% 11.1%
resharpening flake	1 100.0% 4.0%				1 100.0% 2.2%
Column Total	25 55.6% 100.0%	6 13.3% 100.0%	13 28.9% 100.0%	1 2.2% 100.0%	45 100.0% 100.0%

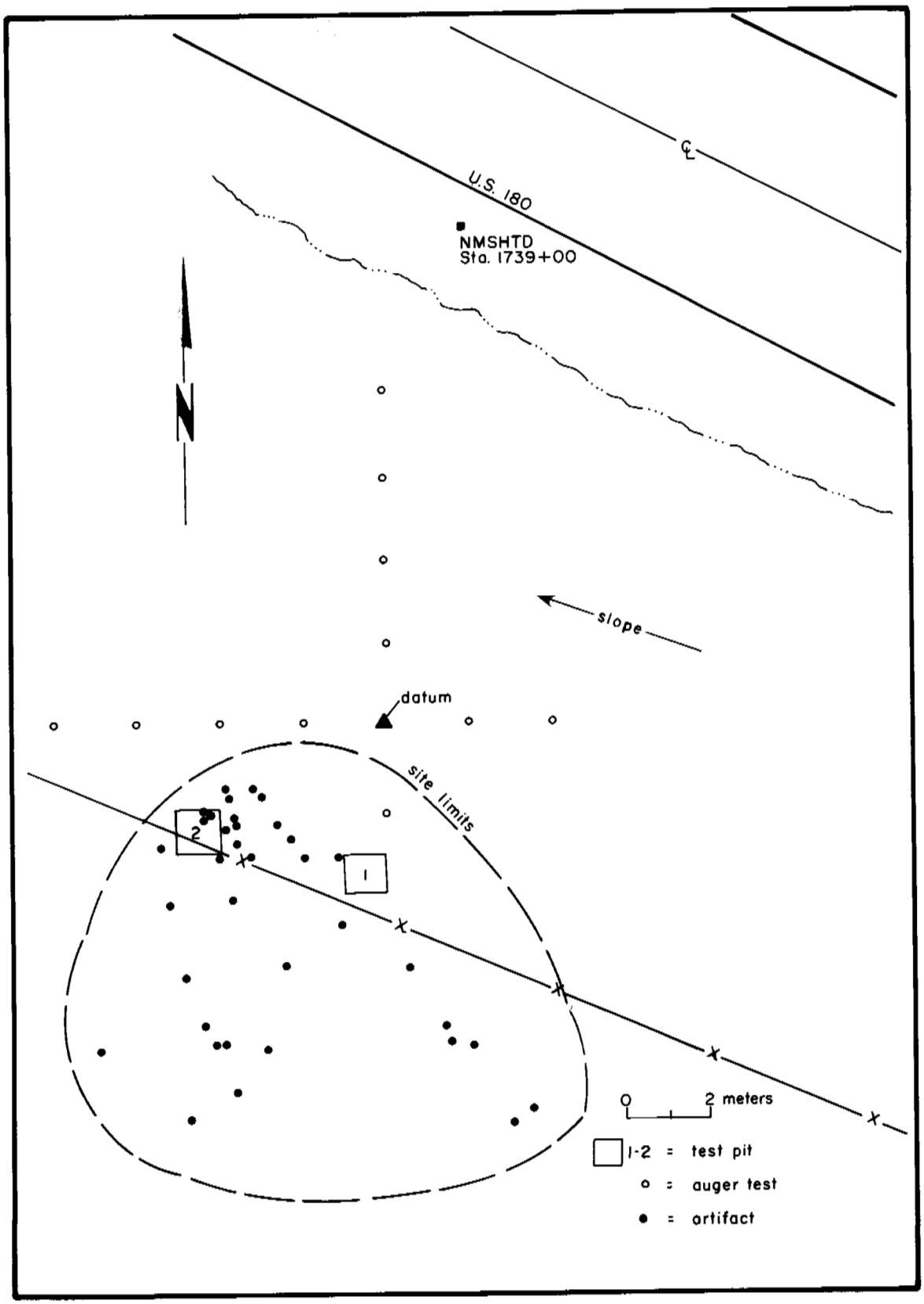

Figure 14. LA 70192, site plan.

Nineteen artifacts were collected from the two test pits and their surrounding areas at LA 70192. These include 18 pieces of lithic debitage (Table 13) and 1 Alma Plain sherd. In addition, the remaining 27 lithic and ceramic artifacts outside of the right-of-way were piece-plotted to get a better picture of the possible function of this small site. Over 80 percent of the lithic material consists of very small tertiary flakes. Most material is chert with a sizable component of obsidian. One Alma Plain sherd was collected and piece-plotted.

Evaluation: This site probably represents temporary occupation of the area. The major activity was probably lithic tool reduction or sharpening. It is possible that a hearth exists in the site portion outside of the right-of-way. There is no subsurface component in the limited area within the proposed highway zone. We believe that no further important information is present in this area and recommend that no further archaeological work be done. However, it is possible that the portion of the site outside of the project limits may have the potential to yield important information on the prehistory of the region.

LA 70196 (Fence Corner Site)

Site Type: Possible pithouse complex.

Cultural Association: Mogollon, San Francisco phase, ca. A.D. 800.

Land Status: Gila National Forest.

Elevation: 1,877 m ((6,160 ft).

Location: [redacted]

Description: The site was initially recorded as a possible Reserve phase cobble mound (Oakes 1989:48). During the testing program the potential cobble mound was examined and found to not represent a cultural feature. However, artifacts and subsurface cultural fill elsewhere on the site suggest prehistoric use of the location, which is located adjacent to Oak Creek (Fig. 15).

The site measures 33 m north-south by 22 m east-west and covers an area of 655 sq m. Approximately 45 percent of the site is within the proposed highway right-of-way.

Six test pits were excavated on the site ranging in depth from 30 to 90 cm, averaging a depth of 50 cm. Soil color varied from dark reddish brown to brown/dark brown (5 YR 3/3 to 7.5 YR 4/2 on the Munsell scale). In addition, 32 auger tests were systematically placed around the site.

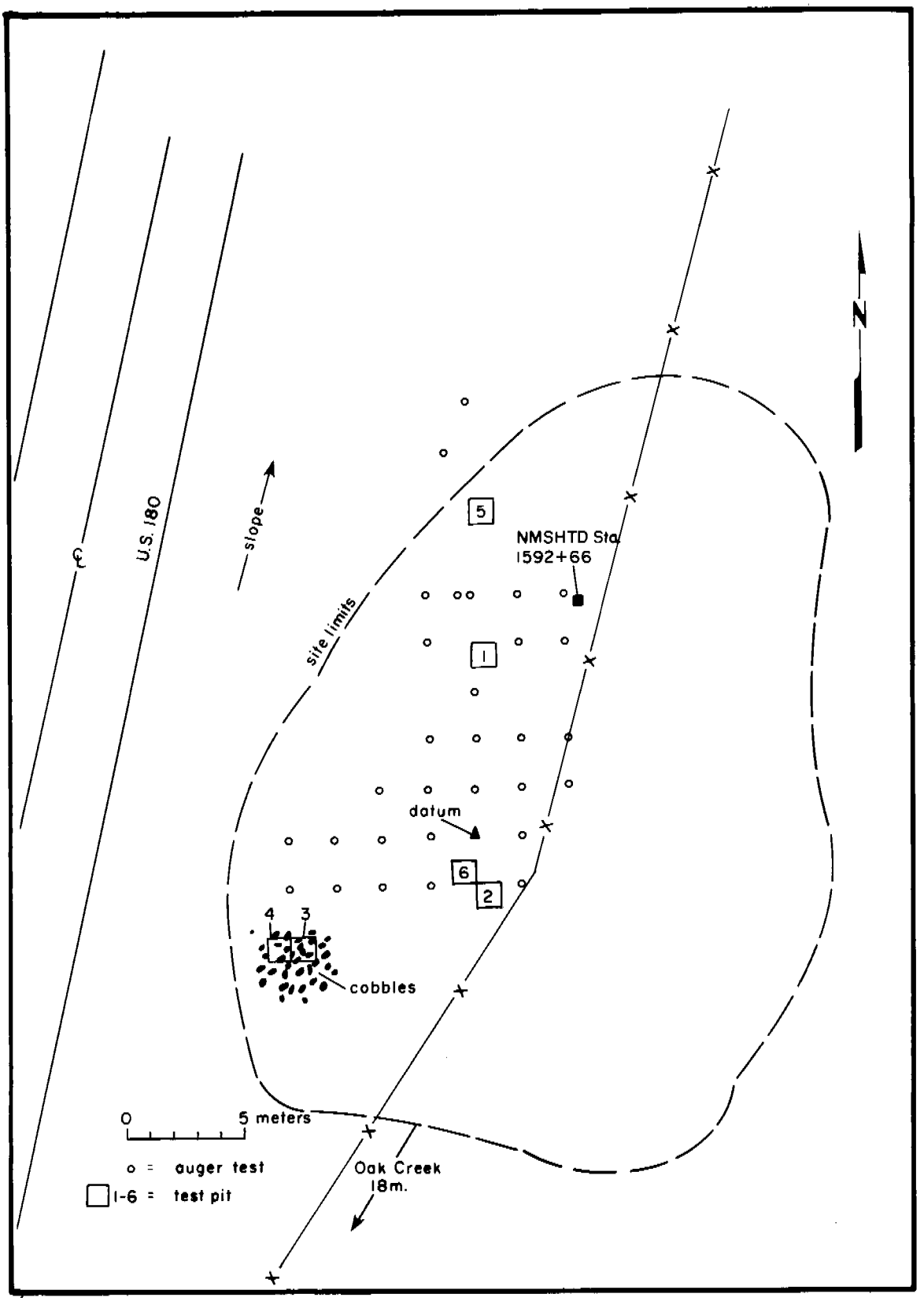

Figure 15. LA 70196, site plan.

Many rocks were present below the surface within the test units; however, no alignments were seen. Charcoal, rocks, and clumped dirt were present at 20 to 40 cm in depth in Test Pit 2. A C-14 sample was taken. Also, Test Pit 5 contained charcoal and a few artifacts to a depth of 80 cm. A demarcation line between clayey and nonclayey soil was present in the profile of the north wall. A flotation sample was taken from Test Pit 6.

A total of 57 artifacts were collected from the six test pits at the site. These include 14 lithic artifacts, 41 ceramics, and 2 pieces of ground stone. The lithic assemblage is mostly chert and includes a chert biface and scraper (Table 14). Ceramics include 35 Alma Plain Brown Wares, 1 San Francisco Red Ware, 1 Mimbres Boldface (Style I), 2 Mogollon Red-on-black, and 2 white ware sherds. The ground stone consists of a large oval mano of granite with bidirectional striations and an indeterminate piece of flat granite with unidirectional striations.

Evaluation: While no structural features were encountered at LA 70196, the depth of charcoal and the possible stratigraphic outline of a pithouse indicate one or more cultural features of the San Francisco phase are present. A larger, Reserve phase room block site, a smaller Reserve phase fieldhouse, and another pithouse complex all lie within a short distance of this site. Is this site part of a continuum of use in this streamside locale? Is it the first site to locate here, and why? The site has the potential to yield important information on the prehistory of the region and additional investigations are recommended.

Table 14. Lithic Artifacts, LA 70196

	Site Number				
	70196				
	Material Type				Row Total
	chert, undiff.	chalcedony	obsidian, undiff.	rhyolite	
core flake	6 60.0% 75.0%	1 10.0% 33.3%	1 10.0% 100.0%	2 20.0% 100.0%	10 100.0% 71.4%
biface flake		1 100.0% 33.3%			1 100.0% 7.1%
debris		1 100.0% 33.3%			1 100.0% 7.1%
scraper	1 100.0% 12.5%				1 100.0% 7.1%
biface undiff.	1 100.0% 12.5%				1 100.0% 7.1%
Column Total	8 57.1% 100.0%	3 21.4% 100.0%	1 7.1% 100.0%	2 14.3% 100.0%	14 100.0% 100.0%

LA 70200 (possibly Forest Service 288)

Site Type: Isolated occurrence.

Cultural Association: Mogollon period.

Land Status: Gila National Forest.

Elevation: 1,841 m (6,040 ft).

Location: [redacted]

Description: Only a few artifacts were seen on the surface of a low knoll during the initial survey (Oakes 1989). Not knowing if subsurface features were present, a testing program was carried out (Fig. 16).

Three test pits and seven auger tests were placed over the potential site. All reached a general depth of 10 cm before hitting deteriorating sandstone, which was 27 cm deep and proved to be bedrock.

Three artifacts were collected and two were left on the surface. The recovered material includes a rhyolite core flake and two sherds of an Alma Plain bowl. Another rhyolite flake and Alma Plain sherd were left uncollected.

Evaluation: The potential site proved to have no depth and only five artifacts were present. The designation should be changed from a site to an isolated occurrence. No further archaeological work is recommended because the area is not likely to yield further information on the prehistory of the region.

LA 70201 (Turkey Toes Site)

Site Type: Possible pithouse complex.

Cultural Affiliation: Mogollon, San Francisco phase, ca. A.D. 800.

Land Status: Gila National Forest.

Elevation: 1,865 m (6,120 ft).

Location: [redacted]

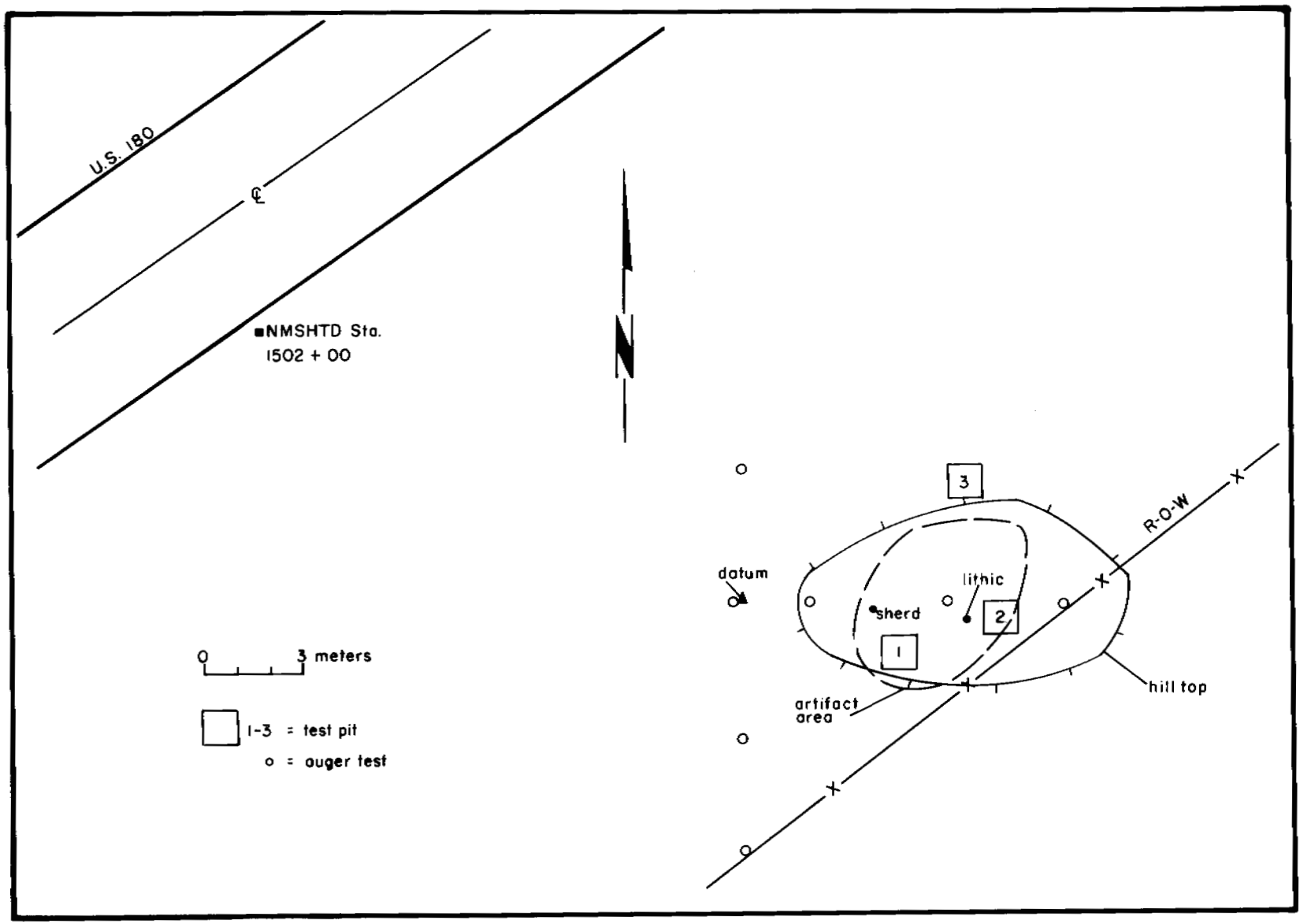

Figure 16. LA 70200, site plan.

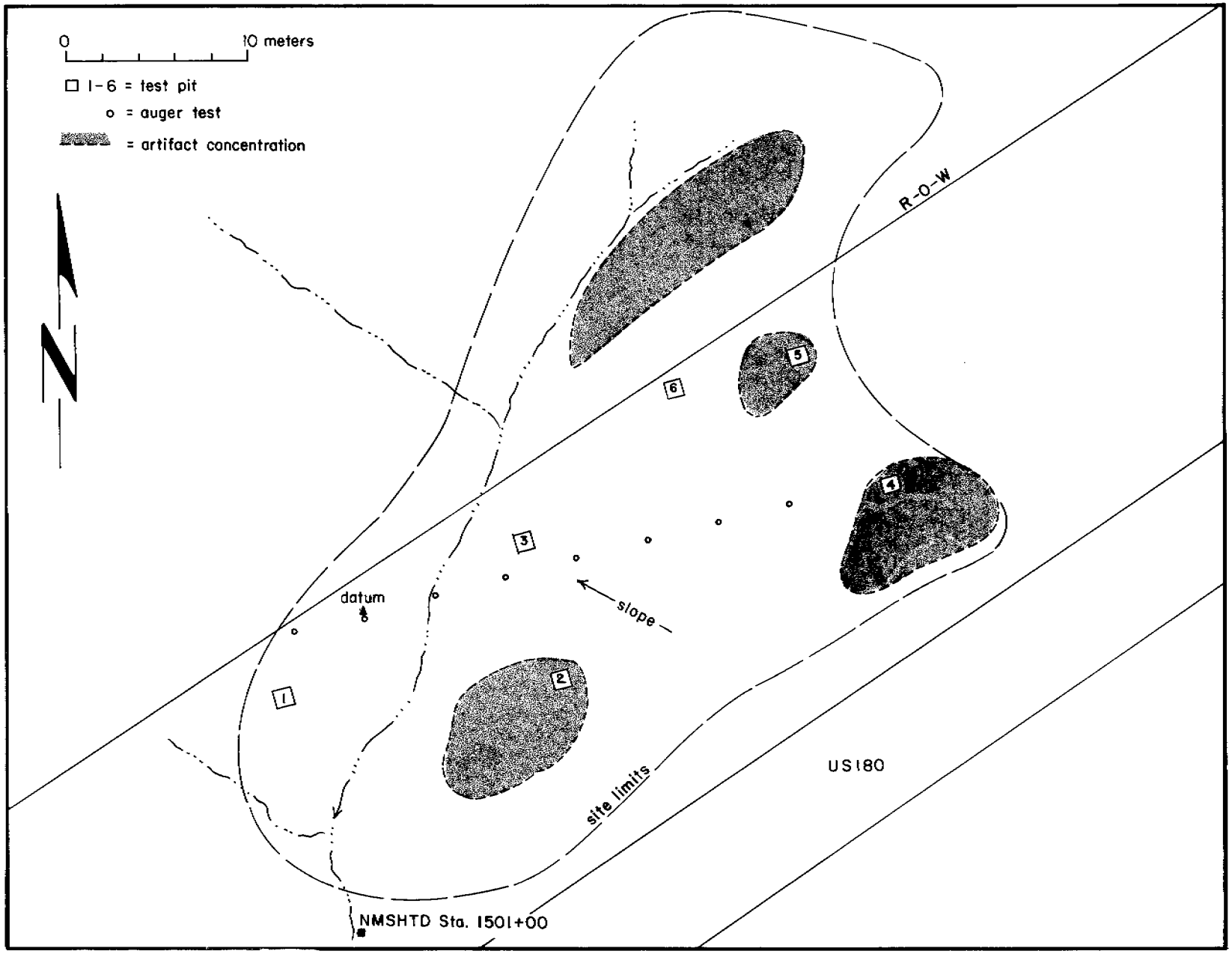

Figure 17. LA 70201, site plan.

Description: The site sits at the base of Turkey Foot Ridge where an early Mogollon pithouse village is located (Fig. 17). It is within a small rincon that has been disturbed by the former blading of topsoil to create a berm for drainage control.

The site measures 54 m north-south by 24 m east-west and covers an area of 1,035 sq m. Approximately 40 percent of the site is within the highway right-of-way.

Six test pits were excavated and nine auger tests were systematically placed across the site. Depth of tests ranged from 18 to 100 cm, averaging 58 cm. Charcoal flecks were present in most test units. In Test Pits 4 and 5, cultural fill reached depths of 60 and 75 cm below ground surface. Excavations hit uneven and unprepared clay surfaces at these depths. These may indicate pithouse units.

The redeposited soil from the creation of the berm was clearly visible in Test Pits 2 and 6 at depths of 30 cm as a pinkish gray stratum (7.5 YR 6/2 on the Munsell scale).

There were 102 artifacts collected from the six test pits at LA 70201. These include 33 lithic artifacts and 69 ceramics. The lithic materials were mostly a poor quality rhyolite but included a fragment of an unidentifiable basalt projectile point (Table 14). The ceramics consist of 56 Alma Plain Brown Wares, 5 smudged interior bowls, 2 smudged jars, 1 Mimbres Boldface (Style I), 3 white wares, 1 corrugated, and 1 incised brown ware.

Table 15. Lithic Artifacts, LA 70201

	Site Number			
	70201			
	Material Type			Row Total
	obsidian, undiff.	basalt	rhyolite	
core flake	1 3.4% 50.0%		28 96.6% 93.3%	29 100.0% 87.9%
biface flake	1 100.0% 50.0%			1 100.0% 3.0%
debris			2 100.0% 6.7%	2 100.0% 6.1%
unident. projectile point		1 100.0% 100.0%		1 100.0% 3.0%
Column Total	2 6.1% 100.0%	1 3.0% 100.0%	30 90.9% 100.0%	33 100.0% 100.0%

Evaluation: Because of the depth of cultural fill, the presence of pithouses on this site is likely. Turkey Toes sits at the base of Turkey Foot Ridge, upon which another San Francisco phase pithouse community is located. The examination of sites with the context of specific settlement systems is important for understanding regional cultural patterns. Therefore, the site is likely to yield important information on the local prehistory of the region. Additional investigations are recommended.

LA 70202 (Forest Service 289)

Site Type: Possible pithouse complex.

Cultural Association: Mogollon, possibly Pinelawn phase, ca. A.D. 500.

Land Status: Gila National Forest.

Elevation: 1,847m (6,060 ft).

Location: [redacted]

Description: On the initial survey (Oakes 1989), several sherds and a one-hand mano were observed on the slopes of a low knoll. The artifacts were outside of the proposed right-of-way; however, the knoll extends into the right-of-way (Fig. 18). Therefore, a testing program examined the possibility of potential pithouses extending into this area.

The possible site measures 11 m north-south by 24 m east-west, encompassing 264 sq m. None of this redefined area is within the proposed right-of-way.

Three test pits were placed randomly in the small portion of the knoll within the right-of-way. Also, seven auger tests were placed in the area. The test units were excavated from 10 to 20 cm in depth, averaging 13 cm. Soil color was dark brown/brown to strong brown (7.5 YR 4/4 to 4/6 on the Munsell chart). Decomposing sandstone was present in each unit almost immediately beneath the layers of topsoil. No artifacts were recovered in the test pits or on the ground surface.

Evaluation: No artifacts or subsurface cultural material or features are present within the proposed right-of-way. Any potential site lies on that portion of the knoll which extends outside of the right-of-way. Because the portion of the site within the project limits are not likely to yield further information on the prehistory of the region, no additional work is recommended. It is possible that the portion of the site outside of the project limits may have the potential to yield important information.

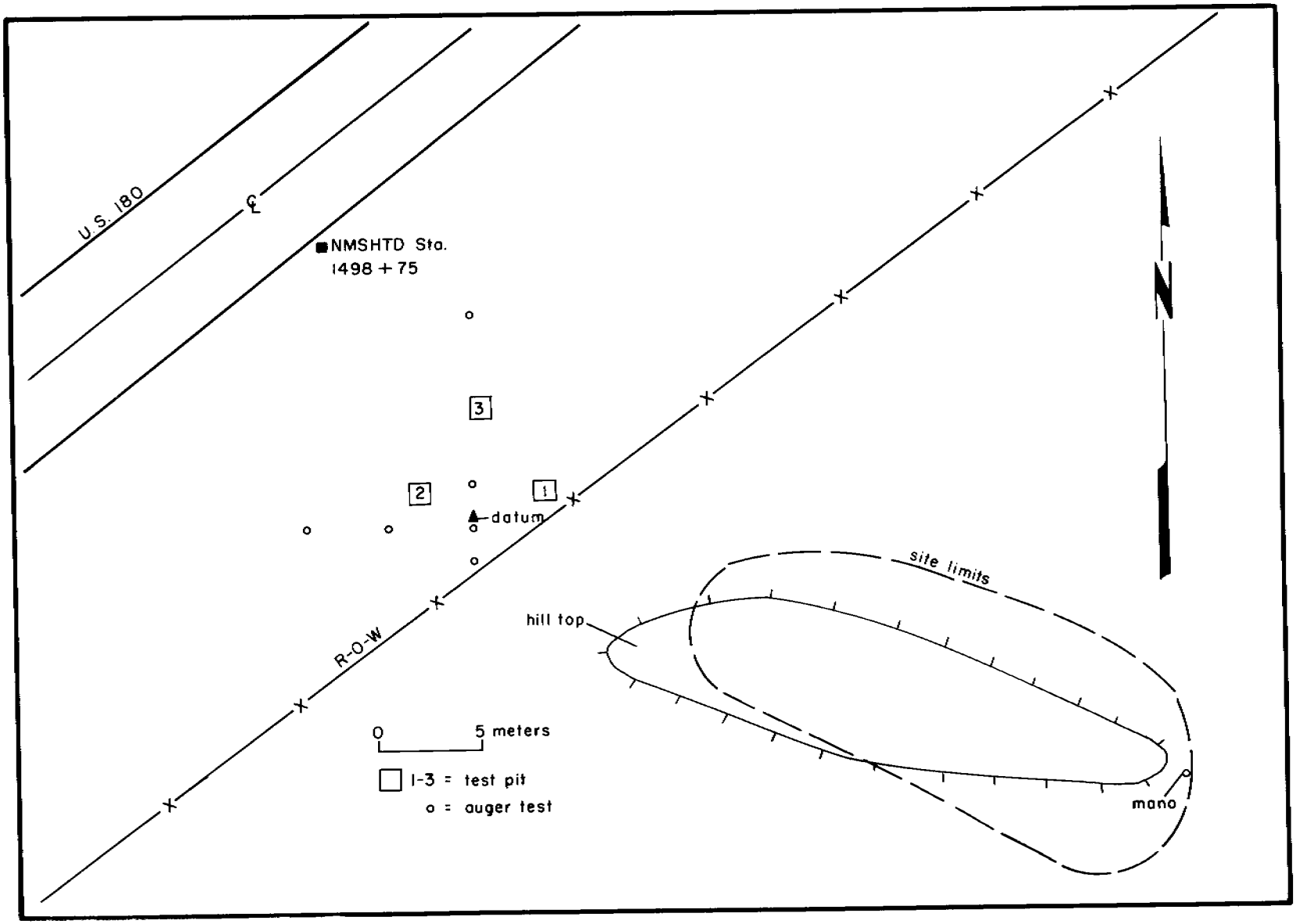

Figure 18. LA 70202, site plan.

LA 70203 (Deer Tree Site; Forest Service 282)

Site Type: Possible temporary camp site.

Cultural Association: Mogollon, San Francisco phase, ca. A.D. 800.

Land Status: Gila National Forest.

Elevation: 1,850 m (6,070 ft).

Location: [redacted]

Description: The site stretches along the base of a low hill and is bordered on the northwest by a small ephemeral drainage (Fig. 19). Most artifacts are at the base of the hill. It was thought that a pithouse might exist somewhere in this area. The site measures 45 m north-south by 14 m east-west and covers an area of 500 sq m. About 85 percent of the site is within the proposed right-of-way.

Seven test pits, 38 auger tests, 4 shovel tests, and 1 backhoe trench were placed on the site. The test pits ranged from 26 to 100 cm with an average depth of 45 cm. Soil color was generally dark brown (7.5 YR 3/2 on the Munsell chart). The face of the drainage channel was cleaned and a 2 m profile was drawn (Fig. 20). Stratigraphic profiles and test units indicated a dark compact soil deposition about 35 cm in depth throughout the site before reaching a sterile substrate of gravels and rocks. Four shovel tests outside of the right-of-way found no subsurface features on the hill slope.

Charcoal flecks, but no soil staining, was present in Test Pits 1, 2, 3, 5, 6, 7 to a depth of approximately 20 cm below ground surface. In Test Pit 6, dark charcoal flecked soil was encountered to about 40 cm in depth. However, its location between a meandering stream bed and the presence of a gravel lens suggests that we dug into an old arroyo bed. Both charcoal and artifacts occur up to 20 cm depth; however, extensive augering and a 30 m long by 1.2 m deep backhoe trench revealed no subsurface features. Also, because of the topographic slope down to the stream bed, all upper level soils may be redeposited alluvium.

Twenty-four artifacts were collected from the site in the test pits and backhoe trench area. These include six lithics artifacts of which four are core flakes of rhyolite and chert and one is a piece of chert angular debris. Ceramics consisted of 12 Alma Plain Brown Wares, 2 corrugated brown wares, 2 Mimbres Boldface (Style I), and 2 white ware sherds.

Evaluation: We believe that the artifacts and charcoal flecks indicate the presence of an archaeological site in the area. However, the augering and backhoe trenching revealed no subsurface features within the proposed right-of-way. The artifacts may therefore represent remains of a camp site rather than a pithouse. All surface artifacts

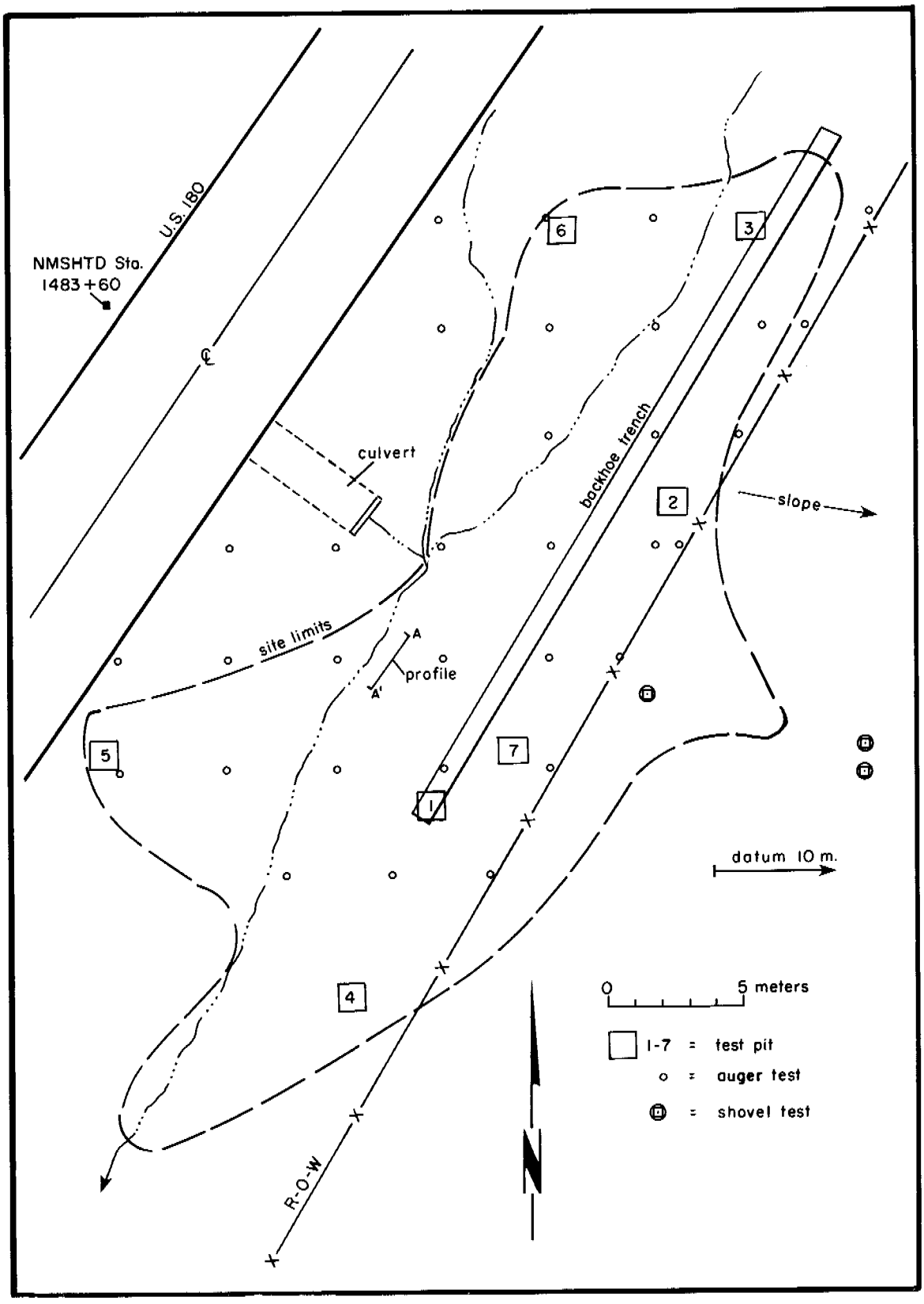

Figure 19. LA 70203, site plan.

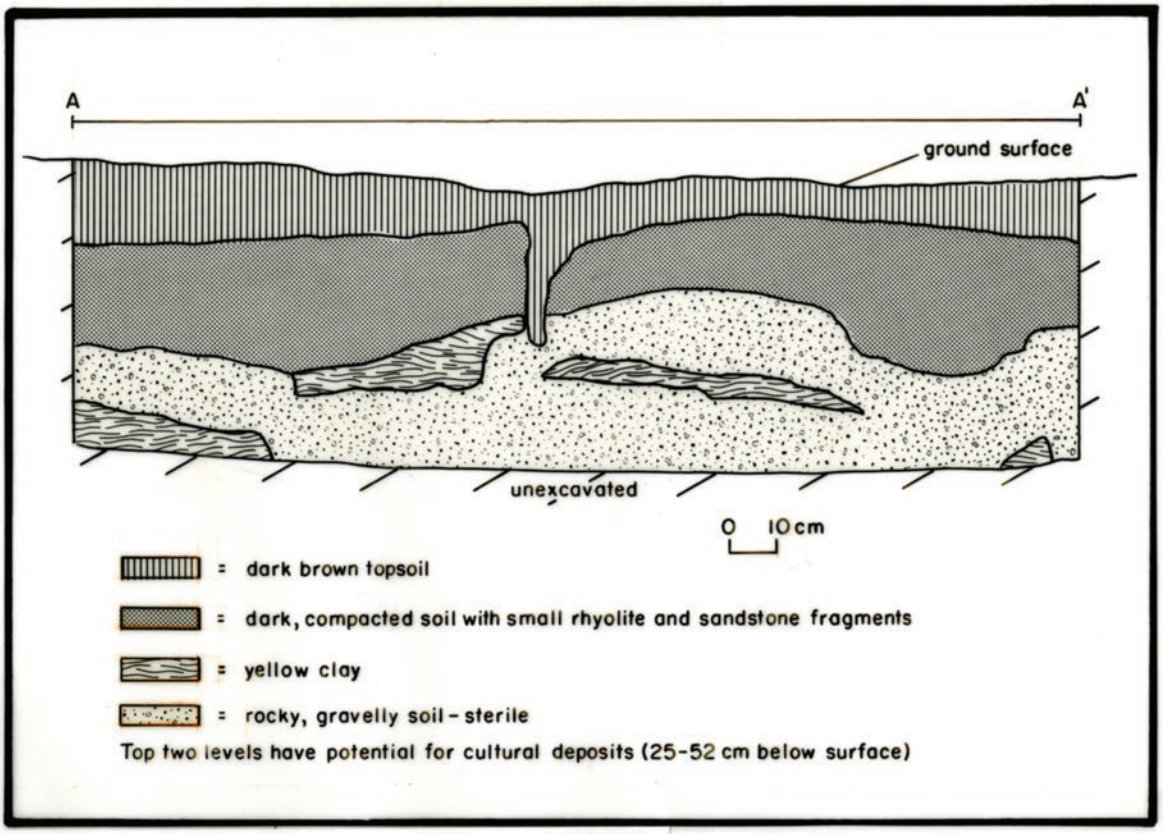

Figure 20. Profile of drainage channel, LA 70203.

artifacts have been documented and we do not think that further important archaeological data can be retrieved from the site. However, the portion of the site outside of the project limits may have the potential to yield important information on the prehistory of the region.

LA 75791

Site Type: Pithouse complex.

Cultural Association: Mogollon, possibly Pine Lawn phase, ca. A.D. 200.

Land Status: Gila National Forest.

Elevation: 1,884 m (6,180 ft).

Location: [redacted]

Description: The site lies on a broad terrace adjacent to Oak Creek (Fig. 21). A potential cobble room block is on the western edge of the site, part of a NMSHTD TCP. Artifacts are thinly scattered over the terrace and near the right-of-way fence.

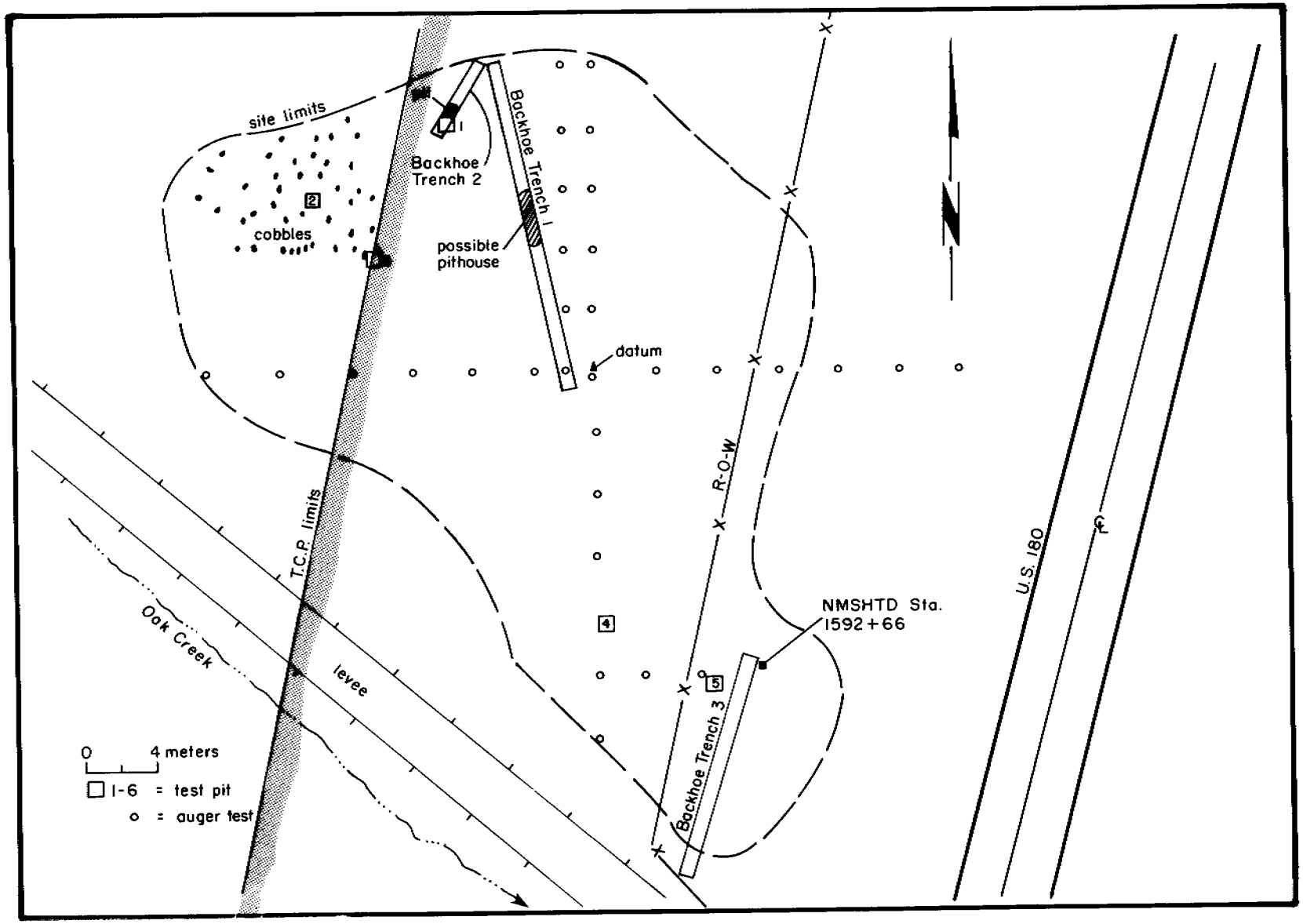

Figure 21. LA 75791, site plan.

The site size is 42 m north-south by 34 m east-west, encompassing 1,150 sq m. Approximately 70 percent of the site lies within the TCP limits.

Five test pits, 35 auger tests, and 3 backhoe trenches were excavated on the site. The test pits ranged in depth from 20 to 50 cm below ground surface and averaged 38 cm. Soil color was generally a dark brown (10 YR 3/3 on the Munsell chart).

Test Pits 2 and 3 were placed within the possible cobble room block. No charcoal artifacts or rocks were present in these test units below 10-15 cm depth. It was concluded that the cobble mound did not represent a room block. Test pits 4 and 5 produced no subsurface artifacts and a few charcoal flecks were present in Test Pit 4.

Test Pit 1 seems to have cut the edge of a small pit structure. Charcoal, burned adobe, and artifacts were present in a dark brown loamy matrix that continued for 40 cm below surface. The surface slopes to the north. A C-14 sample was taken. Auger tests 6 to 10 m to the east of Test Pit 1 (specifically, tests 4-6 and 27-28) revealed very dark soil with flecks of charcoal. Subsequent backhoe trenches were placed over Test Pit 1 and the area to the east. Backhoe Trench 1 was 22.5 m long and 1.2 m deep. A 3.8 m wide by 85 cm deep pit showed up in the backhoe profile. Charcoal and a few artifacts were present within the fill. Backhoe Trench 2 also uncovered a smaller pit 1.0 m wide and 68 cm deep that intruded into Test Pit 1. Charcoal, sherds, and burned adobe were present in the fill. Backhoe Trench 3 revealed no subsurface artifacts or features.

Table 16. Lithic Artifacts, LA 75791

	Site Number					
	75791					
	Material Type					Row Total
	chert, undiff.	chalcedony	quartzite, undiff.	basalt	rhyolite	
indeterminate flake fragment			1 100.0% 25.0%			1 100.0% 5.3%
core flake	4 26.7% 80.0%	3 20.0% 75.0%	3 20.0% 75.0%		5 33.3% 100.0%	15 100.0% 78.9%
biface flake				1 100.0% 100.0%		1 100.0% 5.3%
debris	1 50.0% 20.0%	1 50.0% 25.0%				2 100.0% 10.5%
Column Total	5 26.3% 100.0%	4 21.1% 100.0%	4 21.1% 100.0%	1 5.3% 100.0%	5 26.3% 100.0%	19 100.0% 100.0%

A total of 41 artifacts were collected from the five test pits and three backhoe trenches on the site. Nineteen lithic artifacts consist mostly of core flakes made of a variety of materials--chert, rhyolite, chalcedony, and quartzite (Table 16). The ceramic assemblage is made up of 22 sherds including 19 Alma Plain Brown Wares, 1 smudged ware, and 1 Alma Punched.

Evaluation: The two pit structures found in the backhoe trenches indicate the presence of a pithouse complex at this site location. Our knowledge of small Pinelawn phase pithouse sites in this area is sparse and the excavation of an undisturbed site would add greatly to our data base for the region and allow for comparisons with other pithouse communities on this project. Therefore, the site is likely to yield important information on the prehistory of the region. Additional investigations are recommended.

LA 79792

Site Type: Cobble room block.

Cultural Association: Mogollon, possibly Tularosa phase, ca. A.D. 1200.

Land Status: Gila National Forest.

Elevation: 1,831 m (6,010 ft).

Location: 

Description: This is a six to eight-room cobble structure that sits just outside of a redefined highway TCP (Fig. 22). Artifacts are washing downslope within the proposed right-of-way. Site size is 35 m north-south by 45 m east-west, covering 1,420 sq m.

Six test pits were placed within the site limits. They range in depth from 20 to 60 cm below the ground surface, averaging 33 cm. Soil color varies from dark brown to a light reddish brown (7.5 YR 3/2 to 5 YR 6/4 on the Munsell chart).

Numerous artifacts and charcoal-flecked soil were recorded in Test Pit 1 to a depth of 50 cm. No walls or surfaces were encountered; however, we believe a pit structure was found. In Test Pit 2, artifacts extended to 11.5 cm below the surface where a possible surface was noted in the southwest quadrant. Soil was rocky or clayey and noncultural in Test Pits 3 and 5. In Test Pit 4 a possible single layered rock alignment may represent terracing of the slope, a water control device, or it may be natural. The test unit was too small to determine its function. Test Pit 6 was placed within another cobble mound on the site. Rocks were not aligned nor was there any cultural fill present.

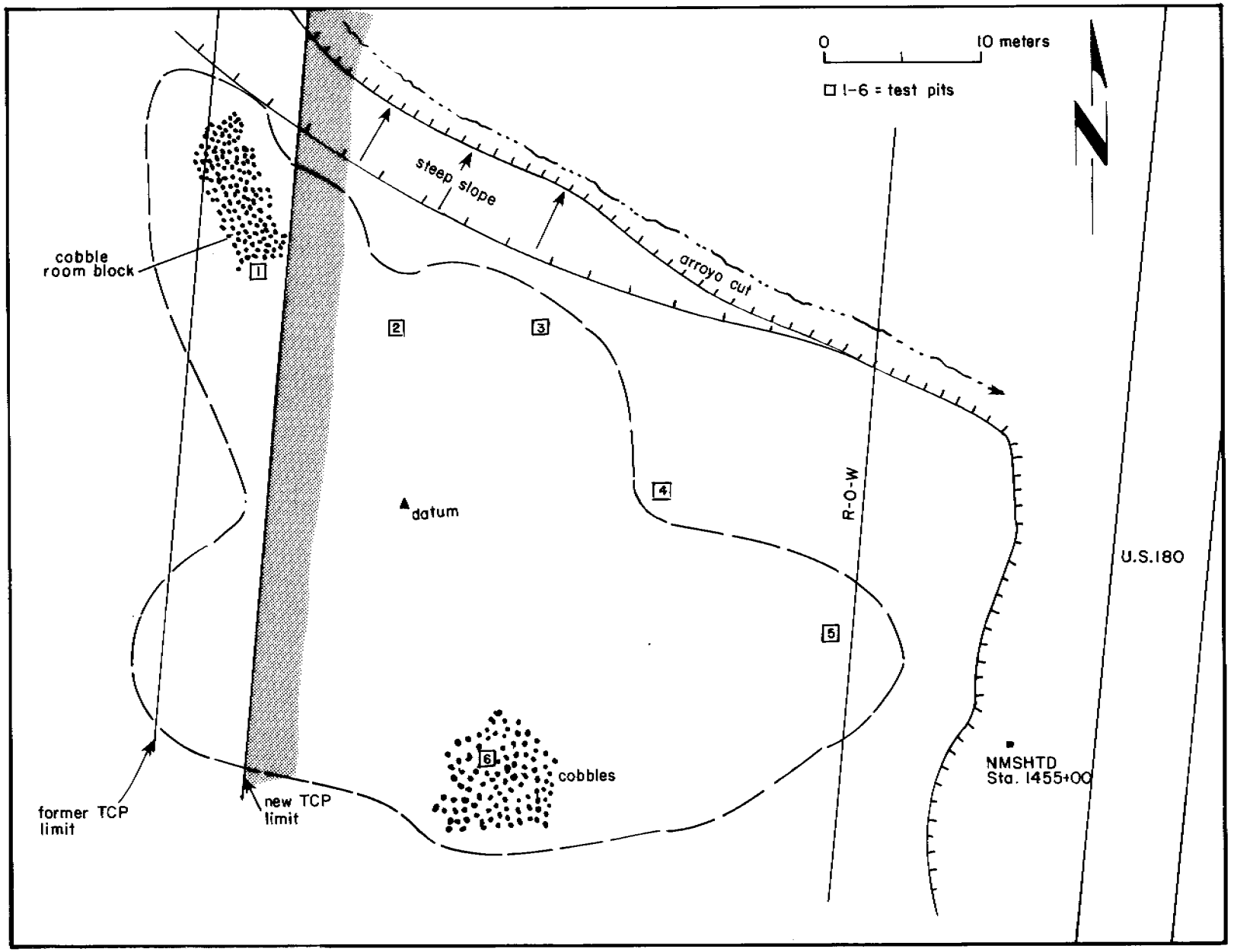

Figure 22. LA 75792, site plan.

Table 17. Lithic Artifacts, LA 75792

	Site Number			
	75792			
	Material Type			Row Total
	chert, undiff.	obsidian, undiff.	rhyolite	
core flake	7 50.0% 87.5%	2 14.3% 100.0%	5 35.7% 62.5%	14 100.0% 77.8%
debris	1 33.3% 12.5%		2 66.7% 25.0%	3 100.0% 16.7%
biface undiff.			1 100.0% 12.5%	1 100.0% 5.6%
Column Total	8 44.4% 100.0%	2 11.1% 100.0%	8 44.4% 100.0%	18 100.0% 100.0%

The collected artifacts numbered 149 and include 18 lithic artifacts, 127 ceramics, and 4 pieces of ground stone. The lithic materials were mostly chert and rhyolite including one rhyolite biface (Table 17). Ceramics consist of 104 Alma Plain Brown Wares, 2 smudged bowls, 2 San Francisco Red Wares, 16 corrugated, 1 incised, 1 Alma Punched, and 1 possible Tularosa Black-on-white. Ground stone artifacts include 3 manos and 1 indeterminate fragment. Two one-hand manos are granite and basalt, a loaf mano is basalt, and the indeterminate fragment is rhyolite. Striations can be seen on all but the granite mano.

Evaluation: Test Pit 1, in front of the cobble room block site that extends into the TCP, contains a pit structure of some depth. It is not known if this is a residential pithouse or storage pit. A utilized surface is also present in Test Pit 2 within the project limits. This is the only potentially late Mogollon site on the project. We believe important archaeological data on such uncommon sites in the Pine Lawn Valley can be obtained regarding ancillary structures and site patterning. Therefore, the portion of the site within the project limits is likely to yield important information on the prehistory of the region. Additional archaeological work is recommended.

LA 78439

Site Type: Pithouse complex.

Cultural Association: Mogollon, late Pinelawn phase, ca. A.D. 400.

Land Status: Gila National Forest.

Elevation: 2,054 m (6,740 ft).

Location: [redacted]

Description: The site was originally considered as part of LA 70188 (Oakes 1989), but the number of concentrated artifacts in this area and the redefinition of site limits at LA 70188 made it apparent, upon testing, that it warranted a separate site identification. The site is situated at the base of a natural depression between two hills in the San Francisco Mountains (Fig. 23).

The site extends for 16 m north-south and 50 m east-west for an area of 680 sq m. Approximately 60 percent of the site is within the proposed right-of-way.

Only two test pits were placed within the right-of-way limits before it became apparent that a site with depth was present. Sixteen auger tests were also put into the site. Excavation depths were 40 and 70 cm with soil color ranging from dark brown to very dark grayish brown (7.5 YR 3/2 to 10 YR 3/2 on the Munsell chart).

In Test Pit 1 artifacts continued throughout the unit until excavations were halted. No pit walls were visible, however. In Test Pit 2, charcoal and burned soil were present and artifacts were densely packed throughout the test grid, including projectile points and bone fragments. An auger test indicated cultural material may extend to 107 cm below the ground surface. This is either a pit structure or a trash pit.

Artifacts recovered from the two test pits at the site total 375. Of these, 351 are lithic artifacts that include a core, three blade flakes, two bifaces, and three corner-notched and one side-notched projectile points (all fragmentary). Given the diversity of debitage recovered and the relatively high incidence of biface flakes, we assume core reduction and tool manufacture were among the activities that took place at this site (Table 18). Chert was the predominant material type present.

Four ceramics were collected from the site. These include one Alma Plain Brown Ware, one smudged ware, and two San Francisco Red Wares.

Twenty small pieces of large mammal bones which had mottled burning were recovered from 40 cm depth in Test Pit 2.

Evaluation: The high frequency of artifacts in Test Pit 2 and the great diversity of artifacts overall indicate the presence of possibly long-occupied pit structures on the site. Ceramics indicate this is a Late Pinelawn phase site of the Mogollon period. The opportunity to examine such a potentially rich site will add measurably to our knowledge of such sites in the region. Therefore, the site is likely to yield important information on the prehistory of the region. Additional archaeological study is recommended.

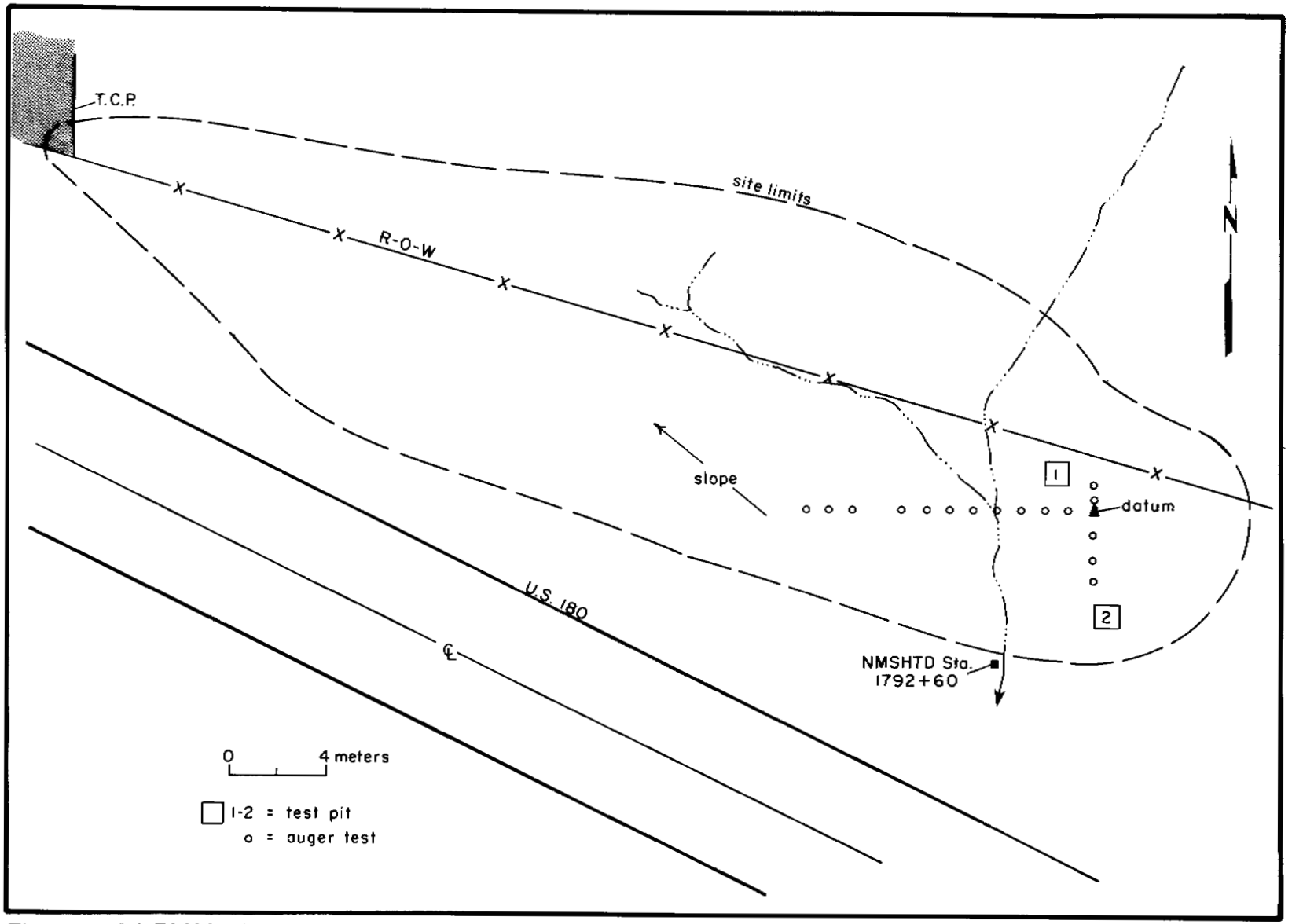

Figure 23. LA 78439, site plan.

Table 18. Lithic Artifacts, LA 78439

	Site Number 78439 Material Type								Site Number 78439	
	chert, undiff.	chalcedony	silicified wood, undiff.	quartzite, undiff.	quartzitic sandstone	obsidian, undiff.	basalt	granite	Material Type rhyolite	Row Total
indeterminate flake fragment	1 100.0% .4%									1 100.0% .3%
core flake	197 68.2% 86.4%	37 12.8% 67.3%	1 .3% 100.0%	6 2.1% 85.7%	1 .3% 100.0%	2 .7% 66.7%	37 12.8% 82.2%	1 .3% 100.0%	7 2.4% 70.0%	289 100.0% 82.3%
biface flake	9 50.0% 3.9%					1 5.6% 33.3%	5 27.8% 11.1%		3 16.7% 30.0%	18 100.0% 5.1%
debris	14 43.8% 6.1%	18 56.3% 32.7%								32 100.0% 9.1%
notching flake							1 100.0% 2.2%			1 100.0% .3%
blade flake	3 100.0% 1.3%									3 100.0% .9%
core				1 100.0% 14.3%						1 100.0% .3%
biface undiff.	1 50.0% .4%						1 50.0% 2.2%			2 100.0% .6%
unident. corner-notched point	3 100.0% 1.3%									3 100.0% .9%
unident. side-notched point							1 100.0% 2.2%			1 100.0% .3%
Column Total	228 65.0% 100.0%	55 15.7% 100.0%	1 .3% 100.0%	7 2.0% 100.0%	1 .3% 100.0%	3 .9% 100.0%	45 12.8% 100.0%	1 .3% 100.0%	10 2.8% 100.0%	351 100.0% 100.0%

Untested Sites

LA 3563 (South Leggett Pueblo; Forest Service 277 and 412)

Site Type: Cobble room blocks with possible pithouses.

Cultural Association: Mogollon, San Francisco phase, ca. A.D. 800.

Land Status: Gila National Forest.

Elevation: 1,887 m (6,190 ft).

Location: [redacted]

Description: The site sits along the crest of a low hill and consists of three basalt cobble mounds and possible pithouses (Fig. 24). Eight to twelve rooms may be present on the site. Artifacts extend for a short distance west across U.S. 180.

The site measures 78 m north-south by 120 m east-west with an area of 7,000 sq m. A small cobble mound, a possible pithouse, and the extended artifact scatter are within the proposed right-of-way, a total of 30 percent of the site. Test excavations were not carried out on the site because of the existence of known cultural features and the density of artifacts.

Evaluation: The NMSHTD has decided to recommend a data recovery program for the site because of its large size and strong possibility of intact cultural features within the proposed right-of-way. The site is, therefore, likely to yield important information on local prehistory and additional investigations are recommended.

LA 9721 (possibly Twin Pines Pueblo)

Site Type: Cobble room block with possible pithouse.

Cultural Association: Mogollon, Reserve phase, ca. A.D. 1000.

Land Status: Gila National Forest.

Elevation: 1,890 m (6,200 ft).

Location: [redacted]

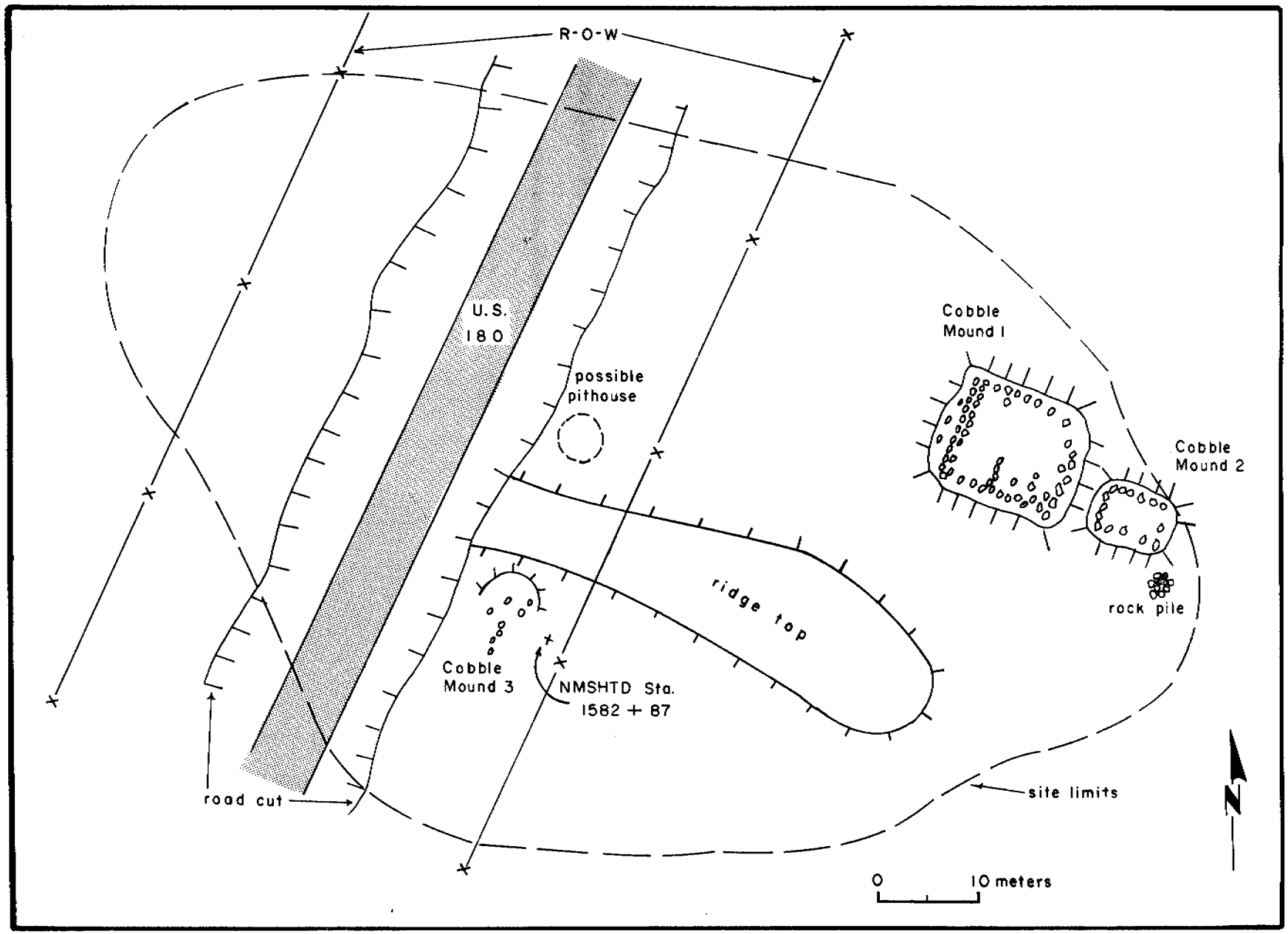

Figure 24. LA 3563, site plan.

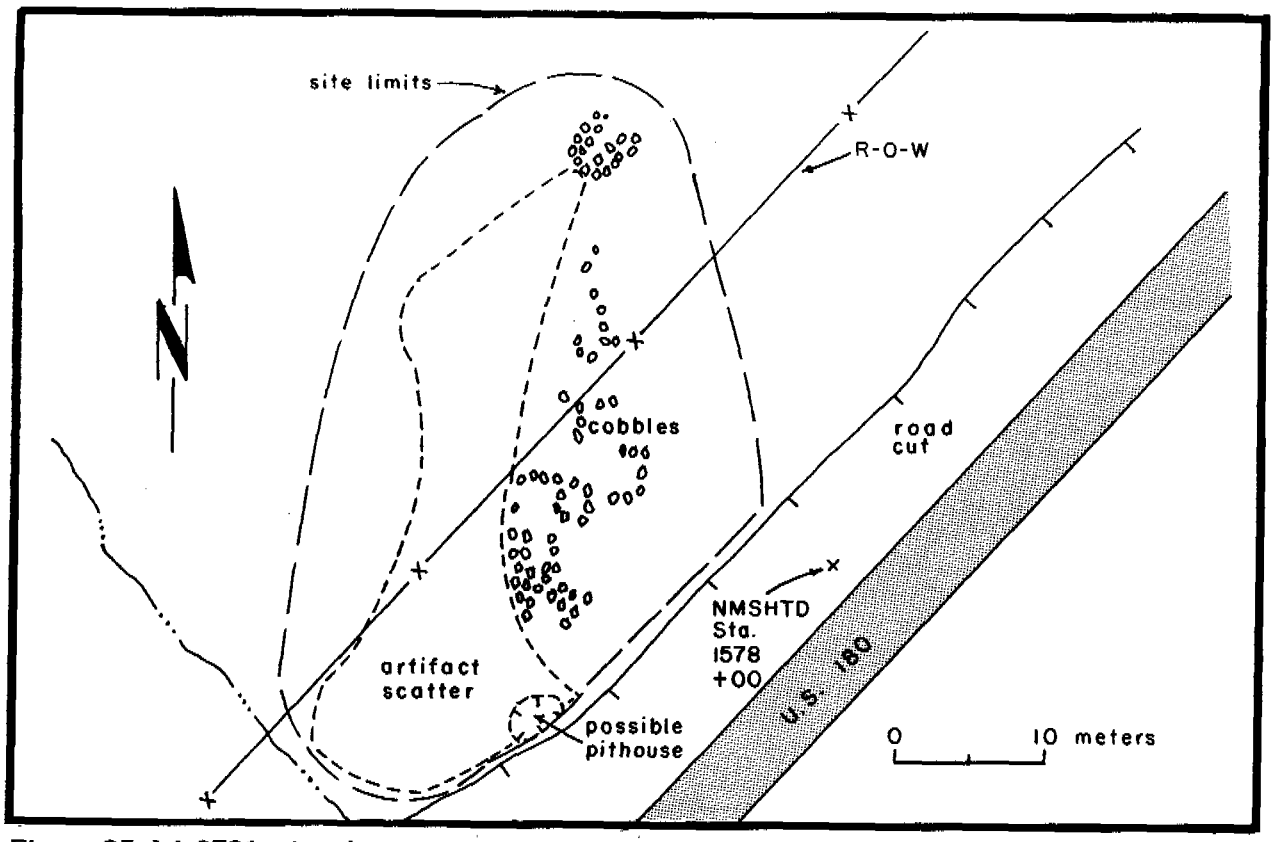

Figure 25. LA 9721, site plan.

Description: The site lies on the southeast slope of a high ridge. A basalt cobble room block extends for 35 m; suggesting a room block of up to 10 rooms (Fig. 25). Also, there is a 2 by 2 m depression that may indicate a pithouse. The site was originally given a designation of LA 70197; however, it was subsequently identified as LA 9721, an earlier assignation.

The site size is 48 m north-south by 45 m east-west, encompassing 1,700 sq m. One half of the roomblock and the possible room block lie within the right-of-way, approximately 40 percent of the site.

No test excavations were placed within the proposed right-of-way.

Evaluation: Because a portion of the roomblock and the depression are within the highway construction zone, the NMSHTD has decided to recommend additional work at the site. It represents one of the few intact room blocks present within the proposed right-of-way and provides an excellent opportunity for study of site organization and function. Therefore, because of the potential to yield important information on the prehistory of the region, we concur on the recommendation for additional investigations.

DISCUSSION

The sites tested within the project area range from as early as the Middle Archaic (ca. 4500 B.C., Chiricahua phase of the Cochise Culture) through the Tularosa phase (A.D. 1100-1350) of the Mogollon Culture including most phases or stages between these two limits. Testing revealed numerous pits or pithouses, potential hearths, and use-surface areas. Most sites, although cut by the original highway, have intact features. It is anticipated that most sites will yield datable remains through absolute methods such as archaeomagnetic sampling, radiocarbon analysis, or obsidian hydration, and secondary dating through projectile point and ceramic typologies and architectural style.

Analysis of artifacts recovered from the testing program was purposefully kept to a minimum during this phase of the project. Detailed studies will be performed on this material upon completion of the data recovery program.

A total of 1,983 artifacts were collected or recorded on the tested sites. These include 974 ceramics, 11 pieces of ground stone, 23 bone fragments, and 975 lithic artifacts. Tabulations of artifact frequencies and ceramic vessel forms are shown on Tables 19 through 22.

Table 19 indicates that most ceramics are Alma Plain or a variant of this type. The Alma series is a poor temporal indicator because it occurs from the earliest pithouse period, A.D. 200-300, through A.D. 1300. The more temporally diagnostic sherds, such as Reserve Black-on-white, Mimbres Boldface (Style I), and Tularosa Black-on-white are few in number. Although we have used them to assign Mogollon phases, we are aware that some site classifications may be rather tenuous and could shift slightly upon further archaeological work. Ceramic dates employed for this project are given below. Dates are those suggested at the 1989 New Mexico Archaeological Council Conference on Southwestern New Mexico Ceramics.

Alma Plain/variants	A.D. 250-1300
Mogollon Red-on-brown	A.D. 650-950
Three Circle Red-on-white	A.D. 700
Mimbres Boldface	A.D. 750-900
Reserve Smudged	A.D. 950-1130
Reserve Black-on-white	A.D. 950-1000
Tularosa Black-on-white	A.D. 1175-1300

Table 19. Ceramic Frequencies for Project Sites

Table. Ceramic Frequencies for Project Sites.

LA	Alma Plain	Alma Plain w/ Polish	Smudged Interior	Smudged Exterior	San Francisco Red	Corrugated	Incised	Punched	Reserve B/w	Reserve Smudged	Mimbres Boldface	Tularosa B/w	Mogollon R/b	Three Circle R/w	White Ware	Incised/ neck banded	Tularosa Patterned Corrugated	Indeterminate	Total
37919	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
39975	167	80	-	1	19	-	-	-	-	-	-	-	-	-	-	-	-	-	267
43785	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
43786	5	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	8
43788	202	61	3	-	8	23	2	-	3	-	-	-	-	1	-	-	2	-	305
70188	2	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4
70189	8	28	5	-	-	8	-	1	1	-	-	-	-	-	1	1	-	-	53
70190	3	9	-	-	-	-	-	-	2	30	-	-	-	-	-	-	-	1	45
70191	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
70192	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
70196	25	10	-	-	1	-	-	-	-	-	1	-	2	-	2	-	-	-	41
70200	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
70201	20	36	5	-	-	1	1	-	-	2	1	-	-	-	3	-	-	-	69
70203	8	4	-	-	-	2	-	-	-	-	2	-	-	-	2	-	-	-	18
75791	3	16	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	22
75792	62	42	1	-	2	16	1	1	-	1	-	1	-	-	-	-	-	-	127
78439	-	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	4
TOTAL	514	292	16	1	32	52	4	3	6	33	4	1	2	1	9	1	2	1	974

Table 20. Vessel Forms for Project Sites

LA	Bowl	Jar	Indeterminate	Total
37919	2	1	1	4
39975	52	109	106	267
43785	-	2	1	3
43786	2	3	3	8
43788	37	111	157	305
70188	1	1	2	4
70189	27	20	6	53
70190	30	9	6	45
70191	-	1	-	1
70192	-	-	1	1
70196	27	12	2	41
70200	2	-	-	2
70201	25	37	7	69
70203	5	10	3	18
75791	11	7	4	22
79792	24	57	46	127
78439	-	3	1	4
TOTAL	245	383	346	974

Only 11 pieces of ground stone were collected from project sites (Table 21). More were observed during testing. There is a range in material types and specific artifact types. Future ground stone studies will focus on these variations and their implied functions.

Table 21. Ground Stone Frequencies for Project Sites

LA	MATERIAL TYPE	SHAPE	ARTIFACT TYPE	PROFILE	CONDITION	STRIATIONS
39975	Granite	Rectangular	Metate	Flat/concave	Fragment	Bidirectional
39975	Granite	Loaf	One hand mano	Concave/flat	Whole	Bidirectional
43788	Basalt	Indeterminate	Indeterminate	Flat	Fragment	Indeterminate
70188	Granite	Oval	Mano	Flat	Whole	Indeterminate
70189	Granite	Oval	Mano	Flat	Fragment	Bidirectional
70196	Granite	Oval	Two hand mano	Convex/concave	Whole	Birdirectional
70196	Granite	Indeterminate	Indeterminate	Flat	Fragment	Unidirectional
75792	Rhyolite	Indeterminate	Indeterminate	Flat/faceted	Fragment	Multidirectional
75792	Basalt	Loaf	Two hand mano	Convex	Fragment	Bidirectional
75792	Granite	Indeterminate	Mano	Convex	Fragment	Indeterminate
75792	Basalt	Oval	Mano	Convex	Whole	Unidirectional

The lithic artifacts represent material types that are almost all locally available (Table 22), with the possible exception of obsidian. While several obsidian sources are known approximately 56 km (35 mi) distant, such as Mule Creek to the south and Red Hill to the north, we believe we have identified at least one closer source near Gwynn Canyon, 32 km (20 mi) to the east. This source was initially located by Wills during recent field sessions at the SU site.

Although the material types used seem generally the same on all sites, the proportions employed by different sites is intriguing. We may be seeing temporal variations in material type selection. When we have increased the lithic data base through excavation this trend will be statistically examined. We will also look at changing material type selection as sites progress north through Pine Lawn Valley to the San Francisco Mountains.

Differences in platform preparation on flakes (not shown in tables) also seem to be evident between aceramic and ceramic sites. The frequencies observed are so low, however, that we hesitate to make even broad generalizations at this point.

Table 22. Lithic Material Types for Project Sites

	Site Number							
	37917	37918	37919	39975	39979	39982	43785	43786
Material Type chert, undiff.	16 3.4% 31.4%	23 4.9% 25.6%	46 9.7% 65.7%	31 6.6% 34.1%		1 .2% 100.0%	12 2.5% 30.8%	2 .4% 22.2%
chalcedony	8 3.8% 15.7%	26 12.4% 28.9%	8 3.8% 11.4%	28 13.3% 30.8%	1 .5% 100.0%		12 5.7% 30.8%	2 1.0% 22.2%
silicified wood, undiff.				1 50.0% 1.1%				
quartzite, undiff.	6 8.7% 11.8%	4 5.8% 4.4%	6 8.7% 8.6%	13 18.8% 14.3%			3 4.3% 7.7%	
quartzitic sandstone		2 40.0% 2.2%		2 40.0% 2.2%				
obsidian, undiff.	8 7.2% 15.7%	31 27.9% 34.4%	5 4.5% 7.1%	5 4.5% 5.5%			9 8.1% 23.1%	
basalt	10 12.7% 19.6%	4 5.1% 4.4%	5 6.3% 7.1%	5 6.3% 5.5%			2 2.5% 5.1%	
granite								
rhyolite	3 3.2% 5.9%			6 6.3% 6.6%				5 5.3% 55.6%
limestone								
siltstone							1 50.0% 2.6%	
Column Total	51 4.9% 100.0%	90 8.6% 100.0%	70 6.7% 100.0%	91 8.7% 100.0%	1 .1% 100.0%	1 .1% 100.0%	39 3.7% 100.0%	9 .9% 100.0%

(continued)

Table 22. Continued

	Site Number							
	43788	70188	70189	70190	70191	70192	70196	70200
Material Type chert, undiff.	10 2.1% 27.0%	30 6.4% 35.7%	10 2.1% 29.4%	4 .8% 20.0%	11 2.3% 50.0%	25 5.3% 55.6%	8 1.7% 57.1%	
chalcedony	5 2.4% 13.5%	34 16.2% 40.5%	14 6.7% 41.2%	3 1.4% 15.0%	1 .5% 4.5%	6 2.9% 13.3%	3 1.4% 21.4%	
silicified wood, undiff.								
quartzite, undiff.	3 4.3% 8.1%	3 4.3% 3.6%	5 7.2% 14.7%	2 2.9% 10.0%	2 2.9% 9.1%			
quartzitic sandstone								
obsidian, undiff.	2 1.8% 5.4%	10 9.0% 11.9%	2 1.8% 5.9%	11 9.9% 55.0%	7 6.3% 31.8%	13 11.7% 28.9%	1 .9% 7.1%	
basalt		4 5.1% 4.8%	2 2.5% 5.9%					
granite								
rhyolite	17 17.9% 45.9%	3 3.2% 3.6%	1 1.1% 2.9%				2 2.1% 14.3%	1 1.1% 100.0%
limestone						1 100.0% 2.2%		
siltstone					1 50.0% 4.5%			
Column Total	37 3.5% 100.0%	84 8.0% 100.0%	34 3.2% 100.0%	20 1.9% 100.0%	22 2.1% 100.0%	45 4.3% 100.0%	14 1.3% 100.0%	1 .1% 100.0%

(continued)

Table 22. Continued

	Site Number					Row Total
	70201	70203	75791	75792	78439	
Material Type						
chert, undiff.		2	5	8	228	472
		.4%	1.1%	1.7%	48.3%	100.0%
		33.3%	26.3%	44.4%	63.0%	45.1%
chalcedony			4		55	210
			1.9%		26.2%	100.0%
			21.1%		15.2%	20.1%
silicified wood, undiff.					1	2
					50.0%	100.0%
					.3%	.2%
quartzite, undiff.			4		18	69
			5.8%		26.1%	100.0%
			21.1%		5.0%	6.6%
quartzitic sandstone					1	5
					20.0%	100.0%
					.3%	.5%
obsidian, undiff.	2			2	3	111
	1.8%			1.8%	2.7%	100.0%
	6.1%			11.1%	.8%	10.6%
basalt	1		1		45	79
	1.3%		1.3%		57.0%	100.0%
	3.0%		5.3%		12.4%	7.5%
granite					1	1
					100.0%	100.0%
					.3%	.1%
rhyolite	30	4	5	8	10	95
	31.6%	4.2%	5.3%	8.4%	10.5%	100.0%
	90.9%	66.7%	26.3%	44.4%	2.8%	9.1%
limestone						1
						100.0%
						.1%
siltstone						2
						100.0%
						.2%
Column Total	33	6	19	18	362	1,047
	3.2%	.6%	1.8%	1.7%	34.6%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 23. Lithic Artifact Types for Project Sites

	Site Number							
	37917	37918	37919	39975	39979	39982	43785	43786
indeterminate flake fragment	1 20.0% 2.0%						2 40.0% 5.3%	
core flake	35 4.4% 68.6%	60 7.5% 66.7%	56 7.0% 80.0%	69 8.6% 75.8%			28 3.5% 73.7%	8 1.0% 88.9%
utilized core flake		1 16.7% 1.1%		3 50.0% 3.3%				
biface flake	3 6.7% 5.9%	4 8.9% 4.4%	2 4.4% 2.9%	7 15.6% 7.7%			1 2.2% 2.6%	
debris	5 3.7% 9.8%	20 14.9% 22.2%	9 6.7% 12.9%	9 6.7% 9.9%	1 .7% 100.0%		6 4.5% 15.8%	1 .7% 11.1%
resharpening flake								
notching flake								
blade flake								
core		5 50.0% 5.6%	1 10.0% 1.4%	1 10.0% 1.1%				
uniface undiff.	1 100.0% 2.0%							
scraper								
biface undiff.	2 22.2% 3.9%		1 11.1% 1.4%	1 11.1% 1.1%				
drill				1 100.0% 1.1%				
unident. projectile point								
unident. corner-notched point	1 20.0% 2.0%					1 20.0% 100.0%		
unident. side-notched point								
unident. Archaic point							1 33.3% 2.6%	
San Pedro point	1 50.0% 2.0%							
San Augustin point	2 100.0% 3.9%							
San Jose point			1 100.0% 1.4%					
Column Total	51 4.9% 100.0%	90 8.7% 100.0%	70 6.8% 100.0%	91 8.8% 100.0%	1 .1% 100.0%	1 .1% 100.0%	38 3.7% 100.0%	9 .9% 100.0%

(continued)

Table 23. Continued

	Site Number							
	43788	70188	70189	70190	70191	70192	70196	70200
indeterminate flake fragment								
core flake	28 3.5% 75.7%	53 6.6% 63.1%	31 3.9% 91.2%	16 2.0% 80.0%	18 2.2% 81.8%	36 4.5% 80.0%	10 1.2% 71.4%	1 .1% 100.0%
utilized core flake		1 16.7% 1.2%				1 16.7% 2.2%		
biface flake		2 4.4% 2.4%	1 2.2% 2.9%	1 2.2% 5.0%	1 2.2% 4.5%	2 4.4% 4.4%	1 2.2% 7.1%	
debris	7 5.2% 18.9%	23 17.2% 27.4%	2 1.5% 5.9%	3 2.2% 15.0%	2 1.5% 9.1%	5 3.7% 11.1%	1 .7% 7.1%	
resharpening flake						1 100.0% 2.2%		
notching flake		1 50.0% 1.2%						
blade flake								
core	2 20.0% 5.4%							
uniface undiff.								
scraper		1 50.0% 1.2%					1 50.0% 7.1%	
biface undiff.		1 11.1% 1.2%					1 11.1% 7.1%	
drill								
unident. projectile point								
unident. corner-notched point								
unident. side-notched point								
unident. Archaic point		2 66.7% 2.4%						
San Pedro point					1 50.0% 4.5%			
San Augustin point								
San Jose point								
Column Total	37 3.6% 100.0%	84 8.1% 100.0%	34 3.3% 100.0%	20 1.9% 100.0%	22 2.1% 100.0%	45 4.3% 100.0%	14 1.4% 100.0%	1 .1% 100.0%

(continued)

Table 23. Continued

	Site Number					Row Total
	70201	70203	75791	75792	78439	
indeterminate flake fragment			1 20.0% 5.3%		1 20.0% .3%	5 100.0% .5%
core flake	29 3.6% 87.9%	5 .6% 83.3%	15 1.9% 78.9%	14 1.7% 77.8%	289 36.1% 82.3%	801 100.0% 77.4%
utilized core flake						6 100.0% .6%
biface flake	1 2.2% 3.0%		1 2.2% 5.3%		18 40.0% 5.1%	45 100.0% 4.3%
debris	2 1.5% 6.1%	1 .7% 16.7%	2 1.5% 10.5%	3 2.2% 16.7%	32 23.9% 9.1%	134 100.0% 12.9%
resharpening flake						1 100.0% .1%
notching flake					1 50.0% .3%	2 100.0% .2%
blade flake					3 100.0% .9%	3 100.0% .3%
core					1 10.0% .3%	10 100.0% 1.0%
uniface undiff.						1 100.0% .1%
scraper						2 100.0% .2%
biface undiff.				1 11.1% 5.6%	2 22.2% .6%	9 100.0% .9%
drill						1 100.0% .1%
unident. projectile point	1 100.0% 3.0%					1 100.0% .1%
unident. corner-notched point					3 60.0% .9%	5 100.0% .5%
unident. side-notched point					1 100.0% .3%	1 100.0% .1%
unident. Archaic point						3 100.0% .3%
San Pedro point						2 100.0% .2%
San Augustin point						2 100.0% .2%
San Jose point						1 100.0% .1%
Column Total	33 3.2% 100.0%	6 .6% 100.0%	19 1.8% 100.0%	18 1.7% 100.0%	351 33.9% 100.0%	1,035 100.0% 100.0%

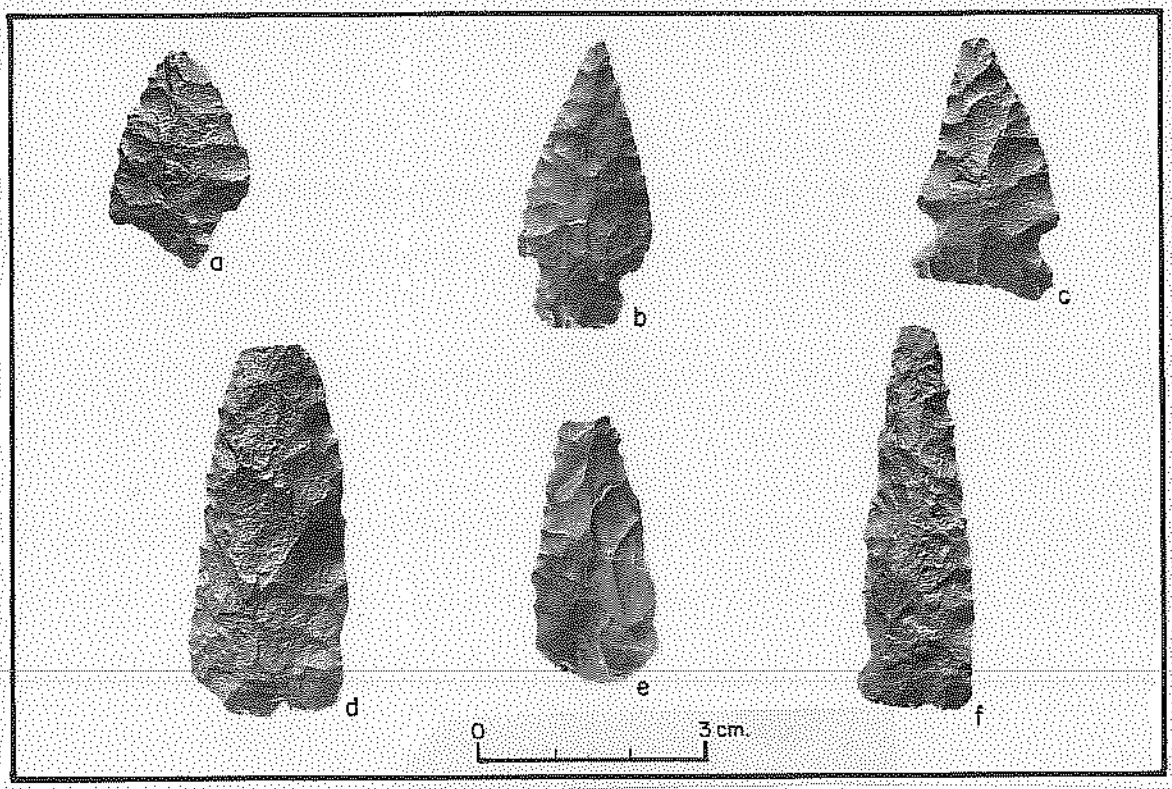

Figure 26. Example of projectile points and drills; (a) Augustin point, LA 37917; (b) San Pedro point, LA 37917; (c) San Pedro point (large), LA 37917; (d) unidentified point, LA 78439; (e) unidentified point, LA 78439; (f) drill, LA 39975.

Few diagnostic lithic artifacts are represented in the collected assemblage (Table 23). Most of these consist of projectile points, although the number of biface flakes suggests manufacture of formalized tools. The 15 projectile points and 9 bifaces range from the Middle Archaic through the Mogollon period (Fig. 26). When placing these points within a temporal framework, we noted disagreements among researchers, particularly when classifying Archaic points. Augustin points are termed Middle Archaic (ca. 4000-1000 B.C.) by Wills (1988); however, Dick (1965:32) places them on the interface between Middle and Late Archaic at 1000 B.C. to approximately 50 B.C. Likewise, San Pedro points were first classified by Sayles and Antevs (1941) and dated from 1500-200 B.C. Recently, Upham et al. (1986:84) suggest they may extend to A.D. 1050 in southern New Mexico. We have used a late Archaic designation for this point type. This disparity in dates makes temporal classification of sites based on projectile point typology a poor choice. However, this is what we have done in several instances because of a lack of other available dating techniques. We expect, therefore, that site classifications based on morphologies of projectile points could vary with further excavation.

RECOMMENDATIONS

Twenty-one prehistoric sites were tested by the Office of Archaeological Studies for NMSHTD Project SP-OF-013-2(210). Of these sites, 12 have subsurface depth or potential cultural features, and are likely to yield important information on the prehistory of the region. Nine sites were found to have no subsurface remains, minimal artifacts, and no further archaeological work is recommended. Two additional sites were not tested (LA 3563 and LA 9721) but are also recommended for data recovery. Table 24 summarizes site recommendations for the project.

Table 24. Site Recommendations for Project Area

Data Recovery	No Further Work
LA 3563	LA 37918
LA 9721	LA 39979
LA 37917	LA 43785
LA 37919	LA 43788
LA 39975	LA 70190
LA 43786	LA 70192
LA 70188	LA 70200
LA 70189	LA 70202
LA 70191	LA 70203
LA 70196	
LA 70201	
LA 75791	
LA 75792	
LA 78439	

The following section presents a data recovery plan for the 14 sites that are recommended for excavation.

DATA RECOVERY PLAN

DATA RECOVERY PLAN

Theoretical Orientation

Introduction

The 14 sites within the proposed project area range in time from the Middle Archaic (ca. 4000 B.P.) through pithouse occupations to Pueblo sites dating to approximately A.D. 1350. Because of the unbroken continuum in site types and periods, we believe that the sites have the ability to answer important archaeological questions regarding mobility strategies in the Mogollon Highlands as influenced by the adoption of agriculture.

The research design may be set forth in a single premise: In the Mogollon Highlands, if there is a continuum from full mobility in the Archaic period, to becoming fully sedentary by the Pueblo period, with the change influenced by increasing dependence on agriculture, then that shift should be evident in the archaeological record. In other words, we propose a general model that suggests a positive relationship between dependence on cultigens and decreasing residential mobility. The logic of this argument is that as cultigen dependency increases, the bulk of harvested food increases, cultigens are stored, and because storage entails investment in facilities and the reuse of sites, residential mobility declines. The model is traditional, however we propose to test it against current archaeological theory.

We are broadly classifying project sites as Archaic (N=3), Pithouse (N=7), or Pueblo (N=4) as a basis for comparison. These sites have been within the following temporal categories:

Cochise Culture:	Early Archaic	1000 B.P. to 8000 B.P.
	Middle Archaic	8000 B.P. to 3500 B.P.
	Late Archaic	3500 B.P. to A.D. 200
Mogollon Culture:	Pithouse	A.D. 200 to A.D. 950
	Pueblo	A.D. 950 to A.D. 1350

Each of these groups is posited to exhibit varying degrees of mobility and sedentism as part of their subsistence strategies. The research design presents specific expectations for each category of site. Basically, we want to know what conditions lead from mobility to sedentism among prehistoric populations in the Mogollon Highlands. Did mobility decrease before or after the introduction of cultigens? How mobile were Archaic populations? How sedentary were Pueblo groups? How are Archaic sites structured as opposed to pithouse and pueblo sites? Are the terms hunter-gatherers and pithouse dwellers valid distinctions or could they define the same population? Do resources used inform on mobility patterns? Do site artifact assemblages inform on length of occupation?

The research design will focus on two aspects of Mogollon adaptations in order to examine variability in mobility patterns. We have selected to study variations in site

structure and subsistence activities among these prehistoric groups. Most arguments for or against mobility strategies revolve around the degree to which populations practiced agriculture. Our research will focus on this current dichotomy as it applies to all prehistoric groups in the study area.

Current Theory

The Mogollon Highlands area near Reserve, Luna, and Pine Lawn Valley, and near the San Augustin Plains have long been thought to represent the homeland for the adoption of agriculture in the Southwest. The dating of charcoal lenses, supposedly associated with maize, at Bat Cave to approximately 6000 to 5600 B.P. (Dick 1965) revolutionized existing concepts about the adoption of agriculture. Because no other southwestern sites yielded such an early date at that time (Tularosa Cave at 2400 B.P. was the next oldest), Haury (1962) proposed that agriculture was first introduced to the Southwest from Mesoamerica via a mountain route at about 6000 B.P. He believed agriculture was limited to the Mogollon Highland area because of a favorable climatic regime. He then assumed, on the basis of available C-14 dates, that the practice of agriculture did not spread to the rest of the Southwest until over 2,000 years later. Archaic hunter-gatherers were thought to have eventually adopted cultigens in response to environmental stress, ceased their continuous wanderings in search of subsistence goods, settled down by streams and arable land, implemented the use of pottery, and eventually became sedentary, building pithouses and then surface rooms and practicing full-scale agriculture.

Recently, this view has changed, primarily because of new investigations carried out by the University of Michigan at Bat Cave (Wills 1988a). Their work has produced revised dates for cultigens (maize and squash) at Bat Cave from 3100 to 2000 B.P., consistent with other sites in the area such as Tularosa Cave. We no longer must postulate a 2,000 year developmental period before the spread of agriculture to other areas. In fact, Wills (1988a:148-149) thinks agriculture probably originated in the Rio Grande Valley or southern Arizona and notes that by 3000 B.P. it is documented in the Jemez Mountains, San Juan Basin, southern New Mexico, and the Tucson Basin. However, Hunter-Anderson (1986:106) believes that the Mogollon Highlands may have felt the pressure of a high human population and thus opted for domestication of cultigens, implying that it was an indigenous process. Wills (1988a) would argue that the adoption of agriculture is not an inevitable effect of population pressure although he agrees that variations in population size would probably create an unevenness in environmental productivity. The presence of cultigens on Archaic sites has only been documented for cave sites near the San Augustin Plains beginning during the Middle Archaic period. No use of cultigens has yet been documented for the few Archaic sites recorded near the project area.

Growth in Archaic populations in the Mogollon Highlands may have occurred because of the widespread availability and diversity of subsistence resources. Resources known to be present in the uplands include deer, elk, rabbit, antelope, mountain sheep, small game, berries, piñon nuts, available water, lithic raw material, chenopods, and grasses (Wills 1988a; Fish et al. 1990). However, resources are subject to, among other factors, variability in timing and amount of available moisture,

season of availability, degree of utilization by humans, presence of disease, mobility of resource, and low yield. Today, Archaic populations are characterized as loose knit with changing group size, being fully mobile, moving freely from resource to resource, using primarily wild plant foods as availability warranted.

Thus, we have a traditional picture of Archaic hunters and gatherers moving freely over the landscape prior to the utilization of agriculture. In recent years, debate has focused on the nature of Archaic mobility patterns in the Mogollon Highlands. Most recent models of Archaic settlement patterns postulate an annual round with winters spent in the highlands and summers in the lowlands, because of temporal and spatial variations in the abundance of resources (Hunter-Anderson 1986:49). Evidence of this pattern has not yet been found archaeologically. Winter residences in the mountains are expected to be small with location dependent on the availability of game (Hunter-Anderson 1986). Wills (1988a:93) believes populations did not winter in the mountains, but rather in lowlands to the south where resources such as agave, sotol, mesquite, and cacti were plentiful. He maintains that high elevation sites such as Bat Cave and Tularosa Cave imply a spring occupation (Wills 1988b:477).

Obviously, congruence with the archaeological record is necessary for confirming Archaic mobility patterns. Spielmann (1990) suggests we look more carefully at resources and their patterns of availability and seasonality of distribution in the environment.

We do know that between 3100 and 2000 B.P., maize and squash had made their appearance at several cave sites in the Mogollon Highlands. At some point, therefore, Archaic peoples incorporated cultigens into their subsistence systems. Traditionally, the introduction of cultigens has perhaps simplistically implied an end to mobility, the beginning use of ceramic vessels, and a shift to permanent residences. Researchers debate the causes for agricultural adoption which vary from human population stress on available resources (Cordell and Gumerman 1989; Hunter-Anderson 1986) to a strategy for enhancing resource availability (Irwin-Williams 1973; Ford 1981; Cordell 1984; Minnis 1985). Actually Wills (1988a:5) sees the two models as noncompeting. Increasing populations lead to the employment of agriculture as a security measure, enhancing subsistence strategies already in place. He thinks the environment of the highlands would not have yielded enough surplus for winter consumption, therefore the practice of agriculture must have been a necessary rather than optional choice (Wills 1988a:146).

The cultivation of plants in the Mogollon Highlands requires planting of crops in the spring and harvesting in the fall. Repeated return to fields during the growing season is also necessary. Thus Wills (1990:324) points out that the conception of agriculture as a casual or simple adaptation is incorrect. The practice of agriculture places potential limitations on mobility patterns. Mountain cultivation may indicate a conscious decision to stay in the uplands and utilize the resources there from spring through fall. Wills (1988b:477) however, cautions that spring use of mountains may have already been part of the Archaic seasonal round.

The use of storage facilities on early agricultural sites would allow populations to maintain mobile lifestyles between highland and uplands (Wills 1988b:477), but as conversely noted by Hunter-Anderson (1986), thus may also permit them to reduce movement. As Wills (1988b:461) notes, this issue is unresolved because no early sites have yet yielded storage facilities.

The presence of residential architecture or ceramics have also not been documented in the Mogollon Highlands until after the adoption of agriculture. Thus, Wills (1988a:479) believes agriculture is not a necessary prerequisite for sedentism. We tend to think that a dependable resource, such as cultigens, is a prerequisite for sedentism, but if in the highlands, agriculture was initiated as a supplement, not a substitute (Johnson 1989:372) to foraging strategies, then sedentism is not tied to the development of agriculture. Archaeologically, we must not equate the practice of agriculture with sedentism (Wills 1988b:479, 482). The very quality, quantity, and diversity in resources that permit hunter-gatherer mobility, as pointed out by Fish et al. (1990:77-78), may also encourage sedentism.

A recent argument ties increasing sedentism to increasing population density (S. Schlanger, personal communication, 1990). People may be forced to reduce their residential mobility because permanent residence near producing fields is necessary for crop maintenance and because there may be increasing populations in the area that would tend to occupy prime land left unattended by part-time horticulturalists.

In the Mogollon Highlands, it is generally believed that maize agriculture did not play a significant role in the subsistence economy of late Archaic populations (Gilman 1987). However, current thinking views foraging with associated mobility or sedentism as part of continuously changing subsistence strategies practiced throughout much of the prehistoric occupation of the highlands (M. Nelson 1990). Site use may shift on a seasonal basis, site populations may vary periodically, and structures change as needs vary. In the words of Ben Nelson (1990:157), "Today, we expect diversity rather than unity, adaptive change as not necessarily permanent, and different trajectories occurring possibly simultaneously in the same area."

Research Expectations

Site Structure

Mobility and sedentary adaptions should be reflected in site structure. Analysis will examine structural and temporal diversity between sites on the project and compare them to other excavated sites in the immediate region such as the SU site, Turkey Foot Ridge, Starkweather Ruin, the Wet Leggett Arroyo site, and Promontory Peak.

Full mobility is traditionally thought to be characteristic of hunter-gatherers, or Archaic populations. If this premise is true, site structure should primarily reflect short-term occupation of the three Archaic sites. Expectations for fully mobile adaptations include expedient investment of labor in dwellings, hearths, and storage

facilities, if present. Also, artifact assemblages should be consistent with short-term occupation data. Domestication of cultigens is not probable, although possible. If Archaic peoples maintained a seasonal round between highlands and lowlands, only seasonal resources of either winter or summer acquisition should show up in the archaeological record. Schlanger (1990) has developed a testable model for predicting length of site occupation from comparisons of types and ratios of artifacts deposited on sites that may be useful for this study.

Expedient lithic reduction is generally associated with sedentary populations and curation with mobile societies. However, Moore (n.d.) cautions that there can be many factors that allow these two strategies to be used by either group. Generally, the use of large, generalized bifaces during the Archaic period is usually thought to represent a curated lithic reduction strategy, while expedient tool production is characteristic of later, more sedentary, groups. The differences between these two strategies are explained in detail in Moore (n.d.). These differences in technological modes can be monitored and quantified for all project sites.

The diverse features and facilities on the Archaic sites suggest differing site functions. The presence of hearths, dwellings, and storage facilities on some documented Archaic sites (O'Laughlin 1983) and not on others informs us that a variety of activities were pursued.

Moore (1989:18) has presented three basic site types for hunter-gatherer systems based on work by Binford (1980) and Fuller (1989). He postulates that sites should consist of either residential or base camps, field camps for collection, and resource extraction locales (i.e., quarries). The residential base camp occupied by foraging groups will exhibit a broad range of maintenance, production, and food processing activities. There should be a low investment in habitation units and storage. Structures, if present, should be ephemeral, and indicate short-term use. Residential camps occupied by collectors would exhibit the same wide range of activities but with a higher construction investment indicative of a longer, perhaps seasonal, occupation. Field camps are temporary locales used for specialized activities, with no storage (expect perhaps caching), and ephemeral structures, if present. Resource extractive locales are not believed to be represented in the project sites.

Moore (1989:21) notes that it is difficult to distinguish short-term residential camps of foragers from field camps of collectors. In addition to examining site structure, he believes that lithic artifact assemblages will vary with the type of site and that general-purpose biface manufacture in general reflects mobility in a group. He suggests using a model such as Kelly's (1988), which examines variation in biface production between the several site types. In Kelly's model:

1. Biface manufacturing flakes are common at base camps and rare at field camps.
2. Utilized flakes are common at field camps as opposed to base camps.
3. Residential base camps exhibit a wide range of activities.

Because the Archaic sites on the project represent a mixture of lithic artifacts, including bifaces, unifacial projectile points, and biface flakes, this model will be used to provide a basis for defining site activities and site types.

The presence or absence of storage facilities on Archaic sites is dependent on the type of site and the activities pursued. Storage is a viable choice when mobility is restricted. Storage facilities may be either temporary, located near gathering sites, or more permanently located near long-term residences (Hunter-Anderson 1986:35). Moore (1989:26) believes foraging base camps would have no storage because resources are for expedient use. However, base camps for collecting groups could have storage facilities. Field camps may have limited storage. If his propositions are correct, then we may expect some Archaic sites to possess storage units and others not.

Length of site occupation may be determined from an examination of site structure and from artifact analyses such as recommended by Schlanger (1990) and Moore (1989). A seasonal occupation might be evidenced by depth of dwellings, presence of interior hearths, storage facilities, labor investment in structures, and types of resources recovered from sites.

Pithouse populations in the Mogollon Highlands range in date from A.D. 200 to A.D. 1000. They are typically characterized as sedentary with a labor investment in dwellings, hearths, and storage facilities. Occupation lengths are thought to vary from seasonal to annual or longer. If pithouse sites do represent mobile populations, then use should reflect seasonality or short-term occupation by groups employing collecting strategies.

Site structure on pithouse sites ranges from single pit units to villages of pithouses with intramural and extramural hearths, storage pits, and outside work areas. To look at the problem of mobility among pithouse dwellers we must, for example, look at site layout and labor investment. We must ask if the floors and walls have prepared surfaces. Are there numerous ancillary features within the structures? Is there a plan to site layouts? Are hearths formally constructed or do they exhibit expediency in preparation? Are hearths both inside and outside of structures? Are storage facilities both inside and outside of structures? Are there specific work areas?

Seasonal or repeated use of pithouses may be evidenced by reconstruction within structures, ample storage facilities,layering of floor levels, and overlapping features.

The number of storage pits on a site relative to dwellings is an indicator of the quantity of goods being stored. The nature of stored resources and the form in which they are stored may indicate whether immediate or future use is intended. Storage facilities outside of pithouse structures are thought to indicate seasonal use.

Length of occupation can be determined by the same factors used to examine Archaic sites, i.e., Schlanger's artifact deposition model (1990), labor-investment comparisons, and degree of storage dependency.

Dependence on cultigens is traditionally assumed for pithouse sites. However, this is an assumption that has persisted throughout archaeological literature and may or may not be correct. Hard (1990) has developed a simple, but apparently effective, model to assist in the quantification of degree of agricultural dependence. He uses a mean mano length index to show that through time, manos increase in length, and correspondingly, increase in grinding surface, which he believes suggests a greater dependence on cultigens. Hard's methods can be applied to the mano assemblages from all project sites for verification of his model.

Pueblo sites of post A.D. 1000 in the Mogollon Highlands are represented by supposedly permanent structures, storage facilities, middens, and dispersed fieldhouses. The shift from storage pits to above-ground storage rooms may be indicative of the shift to greater agricultural dependency (Hunter-Anderson 1986:49). It is thought that mobility was greatly constrained for these populations because of the substantial labor investment and strong dependence on agriculture.

In opposition to hunter-gatherer sites, pueblo residences produced expedient lithic flake tools. Bifaces such as projectile points and knives, were prepared for specific purposes rather than general use. Therefore, fieldhouses and camps will possess mostly expediently used artifacts with few bifaces (Moore 1989:24).

Schlanger's (1990) model can again be applied to compare Pueblo ratio of artifact deposition with those of Archaic and Pithouse populations.

Subsistence Adaptations

The study of subsistence adaptations will focus on the types of resources used by each group of site occupants, whether the resources were expediently prepared, and whether storage was a part of subsistence systems. The various subsistence strategies such as foraging, collecting, and farming will be examined in relationship to their effects on mobility. Seasonality of resource availability will be calculated and potential seasonal rounds proposed, following a model by Hofman (1984). At this point, archaeologists do not have the data to confirm seasonal rounds between highlands or lowlands or in highland areas only. Sourcing of specific resources such as lithic raw material, ceramic clays, and trade wares are necessary to provide information on the mobility of people and goods through the cultural systems.

We will also study the balance between utilized floral and faunal resources as a key to determine seasonal mobility strategies.

The presence of domesticated cultigens, particularly maize and squash, on sites will be evaluated in terms of their relative presence in the food assemblages. Variations in ceramic vessel form, ground stone assemblages, and lithic tool use will also aid in the determination of subsistence practices for each site.

If Archaic populations were fully mobile, then subsistence activities should represent only the range of resources available or easily transported in the immediate environment. However, if they employed a collecting strategy, a wider range of

resources could be expected in site assemblages. Fully mobile people would tend to prepare items for immediate consumption or use, while those less mobile might be expected to cache or store resources. All Archaic people should hunt; however, to what extent is unknown.

Dependence on cultigens is not expected, but possible. Hearths and storage pits will be carefully excavated to ensure that potential cultigens are recovered. The presence of storage pits suggest repeated or seasonal use of a site. Storage pits and the presence of cultigens could be indicative of constrained mobility, at least to some degree.

Ground stone implements may retain some of the materials being ground and suggest whether immediate or future use was intended. Hearths are another source for types of food items present on a site.

If Pithouse peoples are limited in their mobility, then subsistence activities should be more labor intensive and indicate planning for future use. Resource items may include those brought in from longer distances as well as those locally available.

Drying of food items indicates preparation for future use. Dried foods may be present in storage pits and ceramic vessels. The shift to preparation of dried food may have encouraged the use of pottery for boiling food prior to processing and preservation (Hard 1990). It is possible that the number of cooking vessels will increase as the use of dried food increases. A comparison of ratios of cooking vessel sherds with other artifacts in site assemblages may indicate such an increase.

Certain food items, such as maize and squash, require intensive scheduled monitoring, harvesting, and processing before being consumed or stored. If pithouse site assemblages indicate a stronger dependence on other floral and faunal resources than on maize and squash, then we may assume that site dwellers were not to the point of being constrained by agricultural pursuits. Whether crops were necessary subsistence items, however, must be ascertained from comparison with other food resources.

The Pueblo sites (A.D. 1000 to A.D. 1350) in the project area are thought to be small pueblo units or fieldhouses. On some, only the activity areas are within the study area. The size of these small structures suggests a temporary occupation with limited activities. Other larger, primary residences such as Starkweather Ruin, occur nearby in the region. The value of small pueblo sites lies in their emphasis on a limited range of activities that are amenable to archaeological discovery.

Fieldhouses tend to correlate with aggregated local populations, are thought to be used seasonally, and are generally near producing fields. They may or may not contain storage facilities. Trash deposits should be surficial or very shallow. B. Moore (1978:10) has developed several expectations for fieldhouses. These include:

1. Fieldhouses should be independent units with no more than one to three contiguous rooms.

2. No kivas or ritual features should be present.
3. Nearby agricultural fields should be within unrestricted view of fieldhouses.
4. Period of use can range from daily to seasonal to continuous throughout the farming season.
5. The range of activities should be limited.

Wilcox (1978) distinguishes farmsteads from fieldhouses and notes that farmsteads are year-round family residences that can have more than three rooms and other structures could be nearby. Arable land should be present but not necessarily within view of the site. Trash middens should be present and represent a wide variety of activities.

Moore (1978:31) comments that it may be very difficult to distinguish fieldhouses from farmsteads. He notes that cold season architecture, interior hearths, and ritual features should be lacking in fieldhouses. Year-round farmsteads should have substantial architecture with interior hearths for cooking and heating.

If project sites are fieldhouses, chipped stone material from the project sites should be used for the upkeep of farming implements and for the hunting of game. The lithic reduction technology should be expedient with no formal tool production. Moore (1989:32) states that ground stone should not be present; however, this author believes that the processing and grinding of food items for ease of transport back to primary residences is a viable option for fieldhouse users. Moore (1989) also expects faunal remains to be present only in extensive trash deposits. However, we believe that horticulturalists will focus on the taking of game near their fields (the garden-hunting hypothesis developed by Linares [1976]). In fact, Speth and Scott (1989) believe that large game were often hunted in this farming environment rather than small game as proposed by Linares. This trend to large mammal hunting seems to increase as dependency on cultigens goes up. Comparison of large versus small mammal remains on project sites can examine this hypothesis for the Mogollon Highlands.

If some project sites are year-round farmsteads, the lithic artifact assemblage should indicate a wide variety of activities with formal tools made for specific uses. Ground stone tools should also be present. More faunal remains should be present on farmsteads.

The analysis of floral and faunal resources from both fieldhouses and farmsteads should help determine if these sites were used seasonally or year-round or if there are quantifiable differences between fieldhouses and farmsteads in terms of mobility or dependence on maize. Determination of length of occupation should be confirmed by previously mentioned methods.

We have assumed agricultural dependency for Pueblo period sites. By excavating small units such as fieldhouses, farmsteads, and work areas, we may be able to assess the degree of agricultural dependence in the subsistence economy of these people as opposed to other floral and faunal resources.

In conclusion, we are proposing to use the 14 sites recommended for data recovery as a data base for examining current research questions about occupation of the Mogollon Highlands. Deeply stratified cave sites of the Archaic period, and large pithouse and pueblo villages have been excavated in this area. However, there is a lack of smaller, early open-air and later, pithouse and fieldhouse sites to balance the skewing of the existing data base. We believe the project sites have the integrity and the variety to provide such a balance.

Some questions may prove to be easily answered through the implementation of the research design. Were Middle Archaic populations present in the Mogollon Highlands? Do their sites evidence storage facilities? Do site remains indicate a seasonal taking of resources as proposed by Wills (1980)? What resources were used by the various groups in the area? At what time period do cultigens appear on the sites and in what proportions to other resources? Does increasing mano length correspond with greater dependency on agriculture on these sites? Does Schlanger's (1990) artifact ratio model work? Were ceramics being traded in to sites or were they locally made? From how far away were lithic raw materials actually obtained?

Answers to the proposed research questions may be obtained through the compilation of appropriate data sets. Artifacts will be subject to traditional analyses and those proposed in this report. To address the question of residential mobility, lithic artifact analysis will include a detailed study of biface manufacture and discard, following Kelly's (1988) model. We will also look at the amount of lithic manufacture versus the amount of lithic maintenance, the investment in storage facilities and domestic architecture, length of site occupation, and amount of reuse or reconstruction.

Sourcing of resources--floral, faunal, lithic raw material, and ceramic--is important for understanding the mobility patterns of each prehistoric group. Floral and faunal resources are especially useful for information on foods consumed and season of use. To examine the dependency on cultigens, we have developed several lines of evidence to measure that dependency: amount of cooking vessels present, percent of surface on manos, amount and kind of storage facilities, and relative amount of faunal resources.

Specialists will be employed to undertake these studies, where necessary. Additionally, we shall take palynological, phytolith, and macrobotanical samples from available pits, structures, hearths, floors, and cultural fill.

Placing structures and sites in an accurate temporal framework is critical for useful comparisons between site units and sites. Presently, we have only a few temporally diagnostic sherds to indicate the time of occupation on some sites. We shall obtain absolute dates from C-14, dendrochronological, archaeomagnetic, and obsidian hydration samples whenever possible.

Data will be compared to the other larger, excavated prehistoric sites in the Mogollon Highlands to broaden the subsistence data base for the region. Through the examination of mobility patterns from the Archaic through the Pueblo periods, our

knowledge regarding the diversity in subsistence adaptations by these groups within the Mogollon area should be expanded significantly.

Site-Specific Research

LA 3563

This site contains a series of three cobble mounds outside of the proposed right-of-way. Several pitstructures and a possible small cobble mound lie within the planned construction zone. The site probably represents a Late Pithouse period occupation (ca. A.D. 900).

If the site consists of residential pithouses and storage units, it should provide floral and faunal data that can be used to address the subsistence adaptations of pithouse populations. Methods of food preparation, storage, and use can also be examined. Site layout, amount of features, and evidence of reconstruction can be recorded for comparisons with other sites to evaluate residential mobility.

LA 3563 should provide important information on pithouse subsistence and mobility adaptations.

LA 9721

The site consists of a cobble room block and a possible pithouse depression. Approximately one half of the room block and the complete pit structure are within the right-of-way. The site was not previously tested. It dates to the early Pueblo period (ca. A.D. 1000).

This is the only site on the project with intact room blocks of the Pueblo period. Excavation of the individual rooms within the right-of-way and those extending partially over the right-of-way limits should provide information on the use of such features for storage, food preparation, and long-term planning. Subsistence items should be present within rooms and in outside pits or storage areas. We shall record architectural data in order to determine degree of labor intensity and evidence of reuse. Cooking vessels and ground stone should be present and they will be useful for data on the preparation of dried food and mano use.

The possible pit structure should provide information on the reasons for the simultaneous use of such units with above-ground rooms as related to mobility and planned use of the site. In other words, what function does the pitstructure provide that cannot be supplied by the surface rooms?

LA 37917

This is a large Middle Archaic (ca. 3500 B.C.) camp site with associated pits. Numerous artifacts, including projectile points and biface flakes, are present on the

surface. The site provides an excellent opportunity to examine a site of this time period in the Mogollon Highlands. Only one other potentially early Archaic site has been excavated in this area, the Wet Leggett Arroyo site.

The chipped stone material will provide data for the comparative study of biface manufacture and maintenance by Archaic populations, following Kelly's (1988) model. Tool function, as related to hunting, foraging, or collecting strategies, can be addressed with this assemblage. Schlanger's test (1990) for site longevity can also be examined with this artifact assemblage. Subsistence items, such as floral and faunal remains, could be recovered from the pits on the site. These should provide important information on resource use, seasonality of acquisition, and whether or not long-range planning is involved.

LA 37919

The site consists of a large, late Archaic (ca. 1500 B.C.) lithic artifact scatter with at least one associated hearth or pit. Numerous artifacts are present on the surface. The site provides an excellent base for comparison with the two Middle Archaic sites on the project.

Changing mobility patterns over time can be examined through the analysis of the chipped stone assemblage in terms of biface manufacture and maintenance following Kelly's (1988) model and in terms of artifact ratios with Schlanger's (1990) model. The relationship of tool use to hunting, foraging, or collecting strategies can be addressed with this assemblage.

Floral and faunal remains should be recovered from the hearths or pits on the site. These should provide important information of subsistence items used, seasonality of acquisition, and whether the site evidences long-range planning.

LA 39975

This is an extensive Early Pithouse period (ca. A.D. 400) site with pit structures present. Numerous ceramic and lithic artifacts lie on the surface. This is the largest pithouse complex on the project.

The number of pit units should provide valuable site structure data in terms of long-range planning, seasonality of use, evidence of reuse or additional construction, and ratio of storage units to dwellings.

Subsistence strategies should be discernable from the numerous artifact types present. Tool use will be evaluated and used to determine the ratio of floral and faunal use together with actual subsistence items that should be present on the site. Storage facilities should also yeild food remains as ought interiors of cooking vessels. The number and layout of storage facilities is important for assessing long-term planning and mobility strategies. Ground stone should be amenable to testing Hard's (1990) model of agricultural dependency.

The artifact assemblage can test Schlanger's model (1990) of long-term site use and propositions by Moore (1989) that biface production on such sites should be highly specialized.

The site is located less than 1 km (0.6 mi) from another early pithouse site, the SU site. Data from LA 37995 can be compared to this larger pithouse complex in terms of subsistence variations, long-term planning, and site function.

LA 43786

A ten-room cobble room block of the Early Pueblo period (ca. A.D. 1000) lies immediately adjacent to the study area. Within the study area are artifacts, ash lenses, a possible utilized surface, and a possible cobble alignment. These seem to represent an activity area associated with the roomblock.

If this is a work area, we should expect to find evidence of subsistence activities and food preparation, grinding, storage, and use. Manos, cooking vessels, and specialized tools should be present and be suitable for testing Hard's (1990) and Schlanger's (1990) models. Labor investment in building storage pits, possible hearths, and tool manufacture may all contribute to an approximation of length of site use. Ratios of floral and faunal remains should provide clues to the nature of dependency upon cultigens.

LA 70188

This is an extensive Middle to Late Archaic period campsite (ca. 3500-1500 B.C.). Artifacts are numerous, including a few pieces of ground stone. Stained surfaces and pits are present on the site. It is unusual to find a preserved site of this period in the Mogollon Highlands.

The presence of potential hearths and several pits on an Archaic site provides an excellent opportunity to look at subsistence modes of this population. Floral and faunal remains should be present in these areas and, together with the ground stone assemblage, should indicate whether cultigens were being used. We may be able to determine ratios of resources used, seasonality of acquisition, and whether or not storage was a part of subsistence strategies during this time period.

The numerous projectile points and biface flakes should also provide a test of Kelly's (1988) model for biface production as related to residential mobility. Specific site function should be predictable from a study of the various tools on the site. Examination of the use lives of the artifact categories (Schlanger 1990) should also aid in the determination of length of occupation.

LA 70189

This is a small field house or farmhouse with up to six rooms lying immediately outside of the right-of-way. It dates to the Early Pithouse period (ca. A.D. 1000). The site consists of one hearth, a burned activity surface, a possible posthole, and a

potential pit.

Preservation of this activity area should be excellent. Floral and faunal remains should be present in pits and hearths. The numerous sherds should make a study of cooking vessels feasible. Food preparation, grinding, and tool manufacture and maintenance could all have occurred within this work area. The study of artifact ratios, mano lengths, specialized tool manufacture, types and labor intensity of storage facilities should be enhanced by the data from this site.

Because of the presence of several well-preserved activity areas from different sites on the project, comparisons in terms of length of occupation, labor investment, and activities performed should provide valuable insights into Pueblo subsistence strategies.

LA 70191

The site represents a single pit dwelling of the Early Pithouse period (ca. A.D. 200). It sits isolated within a heavily used area of the forest. Nearby are cobble room blocks and lithic artifact scatters. This may be one of the earliest pithouses of this period to be excavated in the region.

This site is also important for providing potential subsistence data on types of resources used, dependency on cultigens at this time, use of storage facilities, and length of site occupation.

If grinding tools and specialized use tools are present, we should be able to quantify the utilization of the various resources. The use of Hard's (1990) and Schlanger's (1990) models are appropriate.

This site may represent the type we are looking for, the transition from mobile subsistence strategies to those less mobile.

LA 70196

This is a Late Pithouse period site, ca. A.D. 800. At least one pit structure is present within the study area.

The site should provide information on the subsistence strategy of a small pithouse unit in the Mogollon Highlands. Floral and faunal resources should be evident within the pit structure and in any other pits that may be present. Dependency on cultigens should be distinguishable as well as on other food items. Ground stone and specialized tools should reveal the site function and provide data on length of occupation and seasonality of resource acquisition.

Construction techniques on the site will be used in comparison with other pithouse sites on the project to determine relative degrees of permanency versus mobility.

LA 70201

The site is probably a pithouse complex of the Late Pithouse period (ca. A.D. 800). There are at least two pit structures present on the site.

The structures should contain floral and faunal remains that will identify types of resources used by the site occupants and allow for an assessment of the season of use and type of food preparation. Evidence of storage should be present. The examination of manos and cooking vessels will provide data on food preparation techniques and dependency on cultigens. Studies of food resource ratios will also provide this information. The balance between expedient (showing little use or wear) and curated tools will be explored and applied to our theories on residential mobility. Site structure, the relationship between pit units, the type of construction, and any evidence of reuse, will allow for estimates of occupation length, seasonal use or reuse, and labor-investment in the site.

Another larger, pithouse complex, Turkey Foot Ridge, is located on the hill directly west of LA 20201. There may be a relationship between the two sites. Turkey Foot Ridge has been previously excavated; therefore, comparative data should be available.

LA 75791

The site consists of a pithouse complex of the Pithouse period, ca A.D. 200. At least two pit structures are present on the site.

This site provides an excellent opportunity to provide comparative data on pithouse subsistence adaptations and degree of residential mobility. The pit structures and any ancillary units should contain floral and faunal resources important for assessing the use of cultigens versus other plant and faunal foods. Mano and cooking vessels analysis will address this question and also look at food preparation, specifically the use of dried foods.

The artifact assemblage on this site will be examined in terms of use and compared to these for other periods. Schlanger's (1990) artifact ratio model is useful also.

The layout of pit dwellings and storage pits should provide site structure data on amount of investment employed on construction, the ratio of storage to residential units, and the seasonal or long-term use of the site.

LA 75792

The site may date to the Late Pueblo period occupation of the Mogollon Highlands, at ca. A.D. 1200 to 1300. It consists of an activity area adjacent to a cobble room block of approximately six rooms. A utilized surface and at least one pit are present in the work area. It is the latest dating site in the study area.

Site structure for these late sites in the Mogollon Highlands is not well known. LA 75792 provides the opportunity to examine site layout, relationship of pits to above-ground dwelling units, and use of various facilities. Artifact analysis, following Schlanger's (1990) and Kelly's (1988) models, will be used to document site function and assist in the determination of relative dependence on cultigens. Mano and cooking vessel analyses will also be used for this determination. An approximation of the seasonality of use is important for this late site and will enable us to compare lengths of site use through time in the project area.

LA 78439

This site is assigned to the Early Pithouse period at about A.D. 200. It consists of a least one very deep pit structure. Cultural material within the fill is dense.

The wealth of artifacts should provide an excellent opportunity to study tool function and verify Kelly's model (1988) of expedient flake use by those populations that are supposedly less mobile. The floral and faunal data should allow an assessment of food resources used and in what proportions. Dependency on cultigens is an important issue for Early Pithouse sites. Evidence for such dependency will be sought in hearths, storage pits, and outside activity areas, if present. Mano analysis, using Hard's (1990) premise, will also be employed. The excavations will focus on locating ancillary storage units and hearths to assist in the assessment of subsistence strategies.

Length of occupation and seasonality of use are other research foci that we will determine from excavation data to answer the larger questions of changing residential mobility as dependency on cultigens increase.

Field Methods

A primary datum will first be established for each of the 14 sites on the project, from which at least two baselines will be run. From these, a 1 by 1 m grid system will be imposed over each site. Surface collections and initial excavation units will be made within the grid system. Hand tools such as trowels, shovels, picks, brushes, and dental picks will be used for the excavation of cultural material and features. Mechanical equipment will be used, if necessary, to strip disturbed or sterile overburden from portions of sites.

Excavation units will consist of 1 by 1 m grids placed initially within known cultural features. They will be dug in 10 cm arbitrary levels unless natural or cultural stratigraphic breaks are evident. If natural breaks are defined, excavations will continue in levels determined by the depth of the strata. The excavation units will be expanded out from the exploratory grids to determine the nature and extent of any cultural deposits and features that are encountered. Surface stripping will be used to ensure that all subsurface features will be found.

Soil recovered from excavation procedures will be screened through ¼-inch mesh hardware cloth, and all artifacts will be bagged by level. However, artifacts recovered from floors or other use surfaces will mapped in place and bagged separately. Pollen and flotation samples will collected from all cultural strata including middens, floors, and other use surfaces. In addition, an off-site pollen control sample will be collected for comparison with other site samples. Flotation samples will be taken from each cultural stratum and feature encountered. If available, charcoal, archaeomagnetic, and tree-ring samples will be collected to determine the dates of the sites.

Soil augers will be used to investigate areas of the sites where cultural features are not visible. Any artifacts collected in this manner will be bagged by depth and saved for later analysis. Subsurface cultural deposits encountered in any auger tests will be further examined through grid excavations or trenched by a backhoe to determine their extent.

All features will be completely excavated and individual field forms filled out for each level excavated, detailing depth of level, type and amount of artifacts recovered, and soil type and color based on the Munsell scale (see Appendix 2 for example of field form). To ensure that all subsurface features are located, a backhoe will trench unexcavated portions of sites with such features present.

All stratigraphic levels and feature profiles will be drawn along with plan views of each feature. Features will be photographed before and after excavation. The site, including all cultural features, locations of excavation units, and topographic changes will be mapped with a transit and stadia rod.

The discovery of human burials during the data recovery program may be likely. Should human remains be discovered, standard archaeological excavation techniques will be employed. These include the definition of the burial locale, the use of small hand tools to expose skeletal materials, mapping and photographing of the skeleton and any associated grave goods, and retrieval of soil for pollen and coprolite analysis.

The field treatment of any human remains found and other sensitive cultural discoveries will be based on the Museum of New Mexico policy adopted March 20, 1986, "Collection and Display of Sensitive Materials" (SRC Rule 11)(see Appendix 3). If human remains or other sensitive materials are uncovered, no person will be allowed to handle or photograph the remains except as part of scientific data recovery efforts. Photographs of sensitive materials will not be released to the media or general public.

Laboratory Analysis

Laboratory analyses will be conducted the staff of the Office of Archaeological Studies and specialized professional consultants. When brought in from the field, artifacts will first be washed, sorted, and catalogued. Any remains that do not appear to be stable will be treated in consultation with the Museum's conservation department.

Ceramic Artifacts

To assign dates, function, and cultural affinity to the ceramic artifacts, a detailed analysis of morphological attributes will be undertaken. Artifacts will be identified by existing type name, vessel and rim form, vessel diameter, paste texture and color, temper material, surface color and finish, slip, design style, thickness, presumed function, and presence of attributes such as burning, smudging, mending, or reworking. A binocular microscope will be used to facilitate the analysis. A sample of sherds of each type will be submitted for petrographic analysis and for x-ray refraction analysis to determine the origin of the sherds. Clay sources for pottery production will be sought during the field excavations and matched with sherd samples in the laboratory.

Lithic Artifacts

Attributes that will be studied on the lithic artifacts include material type and texture, artifact type, breakage type, use, and presence of thermal treatment. Attributes that will be monitored on formal and informal tools include edge angle and shape, type of modification and/or wear. A binocular microscope will be used to identify retouch and wear patterns. Debitage will be examined for evidence of reduction strategy, reduction stage, platform type, percentage of dorsal cortex, platform lipping, artifact portion, direction of dorsal scarring, and size. These studies should allow an evaluation of reduction technology, tool production and use, and raw material procurement strategies. A specialized analysis will involve the study of biface manufacture and use in order to test Kelly's (1988) model for differential biface use between hunter-gatherers and sedentary farmers.

Comparison of lithic artifact data with other sites on the project and in the nearby region may assist in the identification of specific manufacturing techniques and use patterns that may inform on varying subsistence strategies of the different cultural groups in the project area.

Faunal Remains

The faunal analysis will focus on the identification of species, age, and bone elements to assist in determining species used as food resources and portions used by each prehistoric population. Season of death for faunal remains will be determined for young species, if possible. Butchering and processing methods will be examined. We will also investigate the use of faunal materials as tools. Information from the faunal analysis will be used to aid in the determination of season of occupation on sites, hunting patterns and dependency, and subsistence strategies pursued.

Floral Remains

Floral remains will be identified by specific species when possible and compared with plant data from other sites to determine floral resources used by the various groups. It will also be used to help determine the season of use and subsistence strategy employed at each site. Plant types will identify whether domestication of

cultigens was practiced.

Human Remains

The main goal of the skeletal analysis will be a nondestructive study of remains to add to the data base on prehistoric populations from the Mogollon area. The analysis will include standard metric studies, aging and sexing of the remains, and documentation of pathologies, particularly those related to food stress. If bone tissue samples are present, these will be submitted for carbon isotope studies to determine the relative proportion of maize in the diet of site populations. No destructive analysis will take place without prior consultation with concerned parties.

Analysis Results

The final data recovery and analysis report will be published in the Museum of New Mexico's Office of Archaeological Studies *Archaeology Notes.* The report will present the results of the excavations, analysis, and interpretation of the data. It will include photographs, site and feature maps, and data summaries. Field notes and maps, analytic data sheets, and photographs will be deposited with the Archaeological Records Management System of the State Historic Preservation Division located at the Laboratory of anthropology in Santa Fe.

If human remains (including any associated burial goods) are recovered, their disposition will be based on consultations carried out in accordance with federal regulations through the Forest Service. No disposition of the remains will be completed until the wishes of the nearest Indian community, Zuni, are known. Unless an alternative disposition is established through the consultation process, the remains will be submitted to the Museum of New Mexico Archaeological Repository for physical storage at the Department of Anthropology, University of New Mexico. Remaining artifacts will be submitted to the Archaeological Repository for physical storage.

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