MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

STABILIZATION AND DATA RECOVERY PLAN FOR HIGH ROLLS CAVE (LA 114103) ALONG U.S. 82, OTERO COUNTY, NEW MEXICO

by
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ADMINISTRATIVE SUMMARY

The Office of Archaeological Studies (OAS), Museum of New Mexico, conducted limited archaeological testing at the High Rolls Cave (LA 114103) in December 1996 at the request of the New Mexico State Highway and Transportation Department (NMSHTD) because of planned reconstruction of U.S. 82. The NMSHTD subsequently canceled the proposed project; however, the site was later placed within the Archaeological Site Stabilization and Protection Project (ASSAPP) because significant cultural resources are currently eroding into the highway right-of-way from the present edge of the cave.

High Rolls Cave is located on the south face of a steep cliff along U.S. 82 in Otero County, New Mexico, on land administered by the Lincoln National Forest within the highway right-of-way. Limited testing revealed deep deposits from the Archaic period, radiocarbon dating between 1260 and 905 B.C. (Lentz 1999). The OAS, in agreement with the Lincoln National Forest, proposes to construct a metal grate across the opening of the cave to facilitate site preservation and to prohibit access by unauthorized persons. Excavation of the cut edge of the cave above the highway is necessary in order to install the grate system on a bedrock surface. The project will be funded under the Archaeological Site Stabilization and Protection Program sponsored by the NMSHTD. A data recovery plan is provided in this report.

Submitted in fulfillment of Joint Powers Project Agreement JOOO89 between the New Mexico State Highway and Transportation Department and the Office of Archaeological Studies, Museum of New Mexico.

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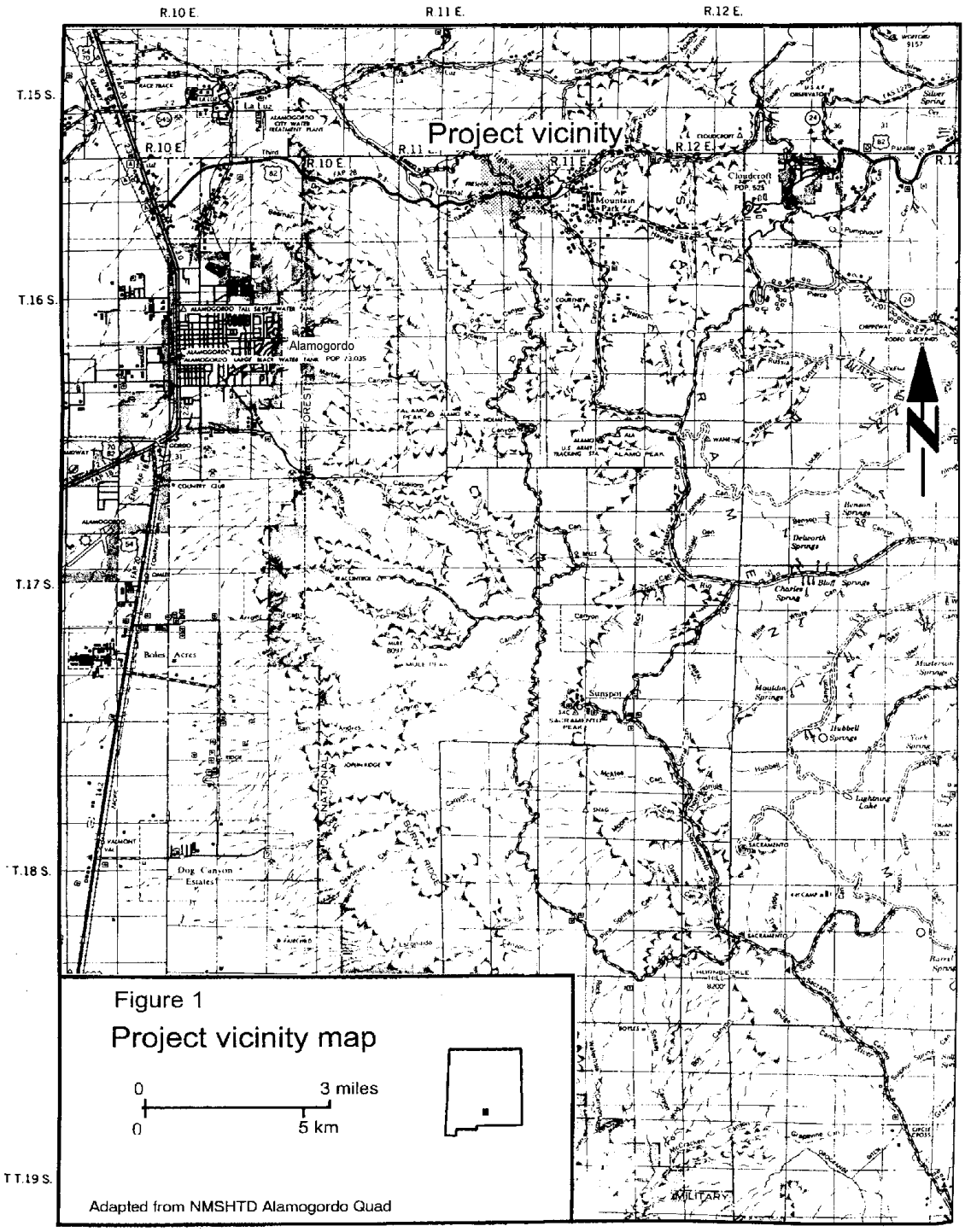
INTRODUCTION

In December 1996, the NMSHTD authorized the OAS to conduct archaeological testing at High Rolls Cave (LA 114103) located along U.S. 82 near High Rolls, Otero County, New Mexico (Fig. 1). The site is within the highway right-of-way on land administered by the Lincoln National Forest. A report detailing the findings was completed by Lentz (1999).

The purpose of the testing program was to determine the amount and extent of subsurface materials within High Rolls Cave. The front part of the cave had been cut during initial construction of U.S. 82. Testing involved mapping of the cave and documentation of disturbances within the cave, such as potholes. Test units, measuring 1 m sq, were dug into the cave deposits at several locations. Testing was halted when it was determined that significant cultural materials were present within High Rolls Cave. Subsequent analysis of several radiocarbon samples dated at least a portion of the cave site to ca. 1260 to 950 B.C. (Lentz 1999). These dates would place High Rolls Cave into the Late Archaic period comparable to other known Archaic sites in the area. Fresnal Shelter is a significant rock shelter located in the immediate vicinity of the cave. It is on the State Register of Cultural Properties as are nearby LA 114736 and LA 115521. No sites listed on the National Register of Historic Places are present within the area.

Highway construction activities scheduled for U.S. 82 have been placed on hold indefinitely. However, potentially significant cultural materials within the front part of the cave are currently eroding out of the cave and into the highway corridor. There is high visibility of the cave to the public and digging of potholes is a fairly consistent occurrence. Because of these ongoing events, High Rolls Cave has been placed within the Archaeological Site Stabilization and Protection Project. As a result, a data recovery plan has been prepared in order to prevent further loss of significant cultural information.


R.10 E.
R.11 E.
R.12 E.
T.15 S.
T.16 S.
T.17 S.
T.18 S.
T.19 S.
Project vicinity
Alamogordo
Sunspot
Cloudcroft
Mountain Park
Boles Acres
Dog Canyon Estates
Delaworth Springs
Bluff Springs
Hubbell Springs
Lightning Cake
MILITARY
N
Figure 1
Project vicinity map
0
3 miles
0
5 km
Adapted from NMSHTD Alamogordo Quad

PHYSICAL ENVIRONMENT

Nancy Akins

Geology and Soils

The project area is within the Sacramento section of the Basin-and-Range physiographic province (Fenneman 1931:394). The Sacramento Mountains are part of one of the largest mountain ranges in southern New Mexico. The northern part of this range includes the Sierra Blanca, composed primarily of igneous rocks. The southern portion, or Sacramento Mountains, form a *cuesta* with a rugged escarpment to the west and a gentle eastern slope extending to the Pecos River. The steep western escarpment contains a thick section of sedimentary rocks (Pray 1961:1).

The project area lies along a high canyon wall on the west side of the Sacramento Mountains in a subarea of south-central New Mexico called the Tularosa Basin. The transition between the low, flat, arid Tularosa Basin floor and the high rugged mountain rim is striking. The basin floor, ranging in elevation from 1,188 m to 1,768 m (3,900 ft to 4,800 ft) rises up to the Sacramento Mountains, which average 2,743 m (9,000 ft). The project area is located at 1,905 m (6,250 ft).

Tertiary Age Sierra Blanca volcanics, which are characterized by igneous rocks, occupy the area northwest of the project area. Within the project area are Permian Age limestones of the Yeso formation and San Andres Limestones and Hondo sandstones. San Andres Limestone is a fossiliferous dolomite that occurs in thin to thick beds. That of the Yeso formation is yellow and pink interbedded siltstone, limestone, dolomite, shale, and fine-grained sandstone. Hondo Sandstone is well sorted fine- to medium-grained sandstone in massive beds of limestone (Walt 1980:10-11).

Soils in the project area are predominantly of the Arosa series, formed in alluvium and derived from mixed igneous and sedimentary rocks. These soils are confined to narrow mountain valley floors and support mid to tall grasses, forbs, shrubs, and scattered ponderosa pine. Arosa soils are only slowly permeable and are generally used for livestock grazing, recreation, and wildlife. Mountain soils are Peso series or cobbly clay loams or stony silty clay loams formed from limestone and limestone bedrock. Mid to tall grass, forbs, shrubs, ponderosa pine, and mixed conifers are supported by these soils. Peso soils are moderately to slowly permeable and are used mainly for timber, recreation, and watershed with grazing limited to the less wooded areas (Neher 1976:6, 21; Walt 1980:14).

Climate

Between 1931 and 1983 Ruidoso had an average of 100 frost-free days; however, this is highly variable as the same years produced a range of 104 days (Prince 1980:16). Temperatures are relatively cool averaging 48.2 degrees Fahrenheit with a high of only 64.6 degrees in July and a low 33.1 degrees in January. Annual precipitation over this period averages 54 cm (21.36 inches) with the greatest amounts falling in July and August (38.3 percent of the annual average). April, May, and November receive the least moisture (Mueller 1991:2). This combination produces a high, cool, and moist zone within a generally dry region where elevation is the key determinant of precipitation and temperature (Prince 1980:18). Mountain valleys of the Mescalero Apache area with Arosa series soils receive 45.7 to 50.8 cm (18-20 inches) of precipitation per year with a mean annual temperature of 41 to 45 degrees Fahrenheit. The frost-free season is from 80 to 110 days. Mountain areas nearby

receive similar amounts of precipitation, 45.7 to 55.9 cm (18-22 inches), have a mean annual temperature of 38 to 45 degrees F, and the same range for the frost-free season as the valleys (Neher 1976:6, 21).

Over the past 8,000 years, this portion of the state has undergone drying with cycles of wetter and dryer periods and a change from winter-dominant precipitation to one of summer monsoons. This has resulted in forest communities shifting to higher elevations but little overall change in the composition of the plant communities. During the early Holocene the climate was much cooler than today with a larger area covered by vegetative associations that are unproductive for hunters and gatherers. Paleoindian activities would have been restricted to portions of the Tularosa Basin and the plains to the east. The middle and late Holocene (8,000 B.P. to the present) were characterized by warmer temperatures and summer monsoons producing conditions more favorable for hunters and gatherers (Keesling 1980:44).

Vegetation and Wildlife Associations

The project area falls within the Transition life association. In this association, trees are the major feature of the vegetation. Ponderosa pine is the most important tree with occasional alligator bark and Rocky Mountain junipers. Less important are the southwestern chokecherry, the black chokecherry, and the black walnut in canyons and mesic areas. In riparian habitats, the narrow-leafed cottonwood, ash-leaf maple, and the Rocky Mountain maple grow. Gambel's oak is common and chestnut oak occasional. Numerous shrubs and shade-loving herbaceous plants occur in this association. Commonly noted grasses are prairie junegrass, several muhly grasses, three-awn, Arizona fescue, nodding brome, Kentucky bluegrass, Bigelow bluegrass, several wheat grasses, squirrel tail, foxtail barley, grama grasses, red top, sleepy grass, and wild rye (Martin 1964:174-175).

Mountain soils associated in the Mescalero-Apache area support a native vegetation of ponderosa pine, fir, aspen, spruce, blue grama, side-oats grama, mountain brome, mountain muhly, needlegrass, fescue, mountain mahogany, oak brush, serviceberry, cliff rose, sedge, piñon, and juniper. This habitat is excellent for elk, bear, and turkey; fair for deer; and poor for fish, pheasant, dove, quail, waterfowl, and pronghorn (Neher 1976:46). Valley soils support a native vegetation of western wheatgrass, Arizona fescue, bluestem, sleepygrass, blue grama, scattered snowberry, mountain mahogany, cliffrose, oak brush, piñon pine, juniper, and ponderosa pine with mixed conifers at higher elevations. This habitat is excellent for pronghorn, fair for dove, quail, bear, fish, pheasant, waterfowl, deer, and elk (Neher 1976:45).

During the testing phase of this project, late summer rains resulted in lush vegetation throughout the area. Plants were dense and left little bare ground. The valley bottom was covered with annual and perennial plants with occasional woody shrubs, ponderosa pines, and alligator bark and Rocky Mountain juniper. Higher elevations are composed primarily of dense ponderosa pine forests, interspersed with white pine and Douglas fir.

CULTURAL OVERVIEW

Adapted from Lentz 1999

The project area, located at the northern margin of the Mescalero Apache Reservation in the central Sacramento Mountains, is situated between several better-known localities. The Sierra Blanca region lies to the north and east, the Tularosa Basin to the southwest, and the Chupadero region to the northwest (Kelley 1984:36). Since little comprehensive work has been done in or near the project area, background information is limited to generalities derived from the surrounding area with a focus on adaptations rather than detailed descriptions derived from previously defined cultural phases.

Paleoindian Period

As noted in a previous section, the climate during the Pleistocene and early Holocene was cooler and less productive at higher elevations. This potential lack of hunting and gathering resources would have severely limited utilization of the project area by early populations while favoring those of the Tularosa Basin and eastern plains (Keesling 1980:44-46).

Reported Paleoindian sites are located in the lower Tularosa Basin near dry lake beds at elevations below 1,524 m (5,000 ft), in the Jornado del Muerto south of Socorro, the lower Rio Grande Valley, and near the Texas-New Mexico state line (Dodge 1980:48-49). Survey of over 7,000 acres (2,833 ha) in the Lincoln National Forest south of the Mescalero Apache Reservation located numerous lithic scatters and isolated projectile points but none were assigned to the Paleoindian period (Spoerl 1985:38). With the exception of rockshelters and caves at elevations between 5,000 and 6,000 ft, Paleoindian use of mountain areas is rare (Sebastian 1989:37). A Paleoindian projectile point and a biface or preform midsection reminiscent of a Paleoindian artifact were found during the BIA survey of Mescalero Apache commercial timber land. The point is a Folsom preform fragment found on a Late Archaic site at an elevation of 2,268 m (7,440 ft) (Broster 1980:93, 97). Another Paleoindian midsection was found on survey at LA 115186 just north of High Rolls Cave (Levine 1996).

Some researchers contend that the small quantity of sites from this period is due to our inability to recognize aspects of the Paleoindian adaptation other than the diagnostic projectile points associated with big-game hunting (Sebastian 1989:33). However, the near lack of evidence in the Sacramentos and other mountainous areas may also reflect the general absence of important resources in mountainous regions during the Paleoindian period.

Archaic Period

The Archaic period, considered a broad-spectrum hunting-and-gathering adaptation, began about 6000 B.C. in response to a warmer and drier climate (Dodge 1980:49; Sebastian 1989:41). Like the Paleoindian period, recognizing Archaic sites in the absence of diagnostic projectile points has led to inconsistent assignment of sites to this period.

Archaic sites are rare in southern New Mexico (Dodge 1980:50; Sebastian 1989:46). Eighteen Archaic or possible Archaic sites were recorded during the BIA survey of Mescalero

Apache lands. Projectile points collected during the survey represent two Archaic traditions, a possible regional variant of the Cochise culture and the Oshara tradition (Broster 1980:94-95). The presence of isolated projectile points and sites indicate the upper elevations of the Sacramento Mountains were used, especially during the Late Archaic. The exact nature of this utilization has yet to be determined. Fresnal Shelter, part of the Alamagordo site complex (which includes two other rockshelters) dates from about A.D. 1 to at least 1600 B.C. (Wimberly and Eidenbach 1981) and will ultimately shed light on Archaic settlement and subsistence strategies used in this area, and possibly reveal a specialized highland hunting pattern (a more detailed description of this site is provided below). A serial foraging strategy where groups move to take advantage of the seasonal availability of particular food resources as opposed to task groups returning food to a base camp (Sebastian 1989:55) is an option for this area. More direct evidence of subsistence systems during the Archaic is needed to address this issue.

Jornada Mogollon

The Mogollon tradition begins with the introduction of ceramic technology, accompanied by an increasing reliance on agriculture and more sedentary life styles around A.D. 400 (Dodge 1980:50). Kelley's (1984) sequence for the Sierra Blanca region is the closest and most applicable to the project area. Early Glencoe phase (A.D. 400 to 1100) habitation sites are pithouse villages located near streams and usually at elevations below 2,134 m (7,000 ft). Pithouses continue into the late Glencoe phase (A.D. 1100 to 1200) but are accompanied by jacal and occasional masonry structures. A diversity of ceramic wares demonstrate an increase in contact and exchange with groups well outside the region. Lincoln phase (A.D. 1200-1400) habitation sites are linear blocks of masonry rooms with subterranean square kivas, and are generally located on ridges or terraces, often away from major streams but usually in the piñon-juniper zone. Ceramic evidence of contact with other groups increases over the Glencoe phase (Dodge 1980:541-52).

The Glencoe phase population was small, sparse, and agriculturally based. Kelley's Glencoe phase sites occur in two valleys on the eastern slopes of the Sacramento and Sierra Blanca mountains. Subsistence was mixed and adapted to an Upper Sonoran environment. Gathering appears to have played a larger role than in other parts of the region while hunting may have been somewhat less important until the late Glencoe phase (Kelley 1984:48-49). Lincoln phase populations also supplemented agriculture by gathering and game may have been a substantial element of the diet. Deer, pronghorn, and smaller animal bones are numerous in sites of the Lincoln phase (Kelley 1984:54).

In the Lincoln National Forest south of the Mescalero Apache Reservation, Glencoe phase sites dating between A.D. 1100 and 1300 are located along the southern tributary drainages of the Peñasco Valley on broad terraces adjacent to streams, or where canyons or ridges extend toward drainages. Most are at the upper end of the piñon-juniper belt or just within the ponderosa pine-dominated transitional zone. Habitations are pit structures and ceramic types associated with this phase include Chupadero Black-on-white, El Paso polychrome, Three Rivers Red-on-terracotta, and Mimbres Black-on-white. These higher elevation sites suggest a pattern of low site density with selective and intense use of some areas (Spoerl 1985:33-35).

The Sierra Blanca region was abandoned by agriculturalists by A.D. 1400, possibly withdrawing to the north and northeast. Evidence of hostilities at one excavated site where the structures were burned and inhabitants killed coincides with the abandonment of the region. Kelley's

suggested sources for the hostilities that may have ended sedentary occupation of the region include pre-Apache nonsedentary inhabitants of the area, other agricultural groups, and Plains nomads. She also sees a deteriorating climate as a factor in causing the conflicts (Kelley 1984:156-159; Sebastian and Levine 1989:94-95).

Protohistoric and Historic Periods

The era just before the Spanish entered the Southwest is one of the poorest known. Mobile groups, including the ancestors of the Mescalero Apaches, left few distinctive remains. Even those areas known to have been heavily utilized in the historic period have few sites that can confidently be identified as Apache (Sebastian and Levine 1989:93).

Much debate has centered around when Apachean groups entered the Southwest. Early entry scenarios place them in southeastern New Mexico in the 1400s while another view considers an entry date in the 1600s (Sebastian and Levine 1989:99). The Mescalero Apaches were recognized as a distinct group in the 1600s. Their territory extended from the Rio Grande east into Texas and south into Mexico. Settlements were located west of the Pecos River, with expeditions for buffalo hunts and to acquire salt and horses extending further east (Opler 1983:419).

The Spanish presence in New Mexico disrupted established relationships between native groups. Apache and Pueblo interactions alternated between raiding and trade, probably depending on climatic and other factors that disturb basic subsistence systems. Spanish Colonial practices cut off access to items and resources necessary for Apache subsistence. With the introduction of firearms and horses, slave raids, restriction of hunting and gathering areas, and competition from Comanches, Apache raiding of Spanish and Pueblo settlements increased (Broster and Dart 1980:77-78). Historic documents relate that in 1778 the Apaches in the Sierra Blanca area had been forced out of their homes by Comanches but had returned by 1789. Apache raiding continued until the 1880s when the United States government's attempts to turn the Mescalero Apaches into farmers were unsuccessful (Schroeder 1973:134-135, 140-142).

The Mescalero Apache Reservation was established by Executive Order on May 29, 1873 (but not confirmed by Congress until 1922), beginning a long period of conflicts with ranchers and government officials (see sections of Harrill 1980; Opler 1983; Opler and Opler 1950; Sonnichsen 1958 for detailed descriptions of historic relationships).

Mescalero Apache territory is characterized by mountain ranges and peaks separated by valleys and flats. Severe winters and short growing seasons discourage agriculture and greatly influence subsistence options, resulting in the continuation of relatively small groups of hunters and gatherers until the late historic period (Opler 1983:419-420). Extended families formed local groups of as many as 30 families constantly moving within a particular area. By around 1850, settlements or headquarters served as centers from which small parties left to obtain resources, returning to process what was acquired. The geographical distribution of plants and animals required that the Mescalero Apaches be very mobile. Their small inventory of possessions included many perishable items. The economy was based on hunting game and harvesting wild plants with a little agriculture. High-elevation game included elk and bighorn. Buffalo was a major meat source but pronghorn and rabbits were also taken from the Plains. Other food animals include deer, opossums, woodrats, squirrels, prairie dogs, ringtails, and peccary. Some groups ate birds, such as turkey, quail, and dove and fish. Carnivores and reptiles were avoided unless taken for their skins or body parts or when no other food was available. Mescal was an important resource in later spring. Other utilized plants were

sotol, bear grass stalks, amole, datil, prickly pear cactus tunas, mesquite pods, vetch pods, wild peas, locust, screwbean, evening primrose, tubers of sedge, rootstocks of cattail, wild potatoes, juniper berries, and agarita berries. Pine nuts, acorns, and walnuts were also gathered. Breads were made of pigweed, tumbleweed, and grass seeds. Berries, mint, wild onion, sage, wild celery, penny royal, horsemint, and hops were also components of the diet (Basehart 1973:145-170; Opler 1983:428-433; Prince 1980:80-83).

The BIA survey of commercial timber lands in the Mescalero Apache Reservation located 53 historic sites and 9 isolated occurrences. Most date from the 1950s and 1970s with the earliest dating from 1880 to 1915. The majority of these sites are attributed to the Mescalero Apaches but a few are Euroamerican or undetermined (Broster 1980:133-135). None reflect the early hunting and gathering use, which may be a reflection of the inability to distinguish these sites from those of earlier groups.

PREVIOUS ARCHAEOLOGICAL WORK IN THE AREA

The closest major archaeological sites to the project area are Fresnal Shelter (LA 10101) (Wimberly and Eidenbach 1977), LA 114103 (the tunnel), and LA 32222, a dispersed lithic and ceramic artifact scatter.

At Fresnal Shelter (LA 10101), the sequence of development dates from about A.D. 1 to at least 1600 B.C. and should ultimately permit internal chronological segmentation. The excavations have yet to be fully reported, but preliminary studies have shown that Fresnal Shelter is one of two sites in southern New Mexico with directly dated evidence of early cultigens. Food remains include wild plants (cactus, sotol, grass seed, and wild squash) but also, even in the earliest deposits, chapalote maize, a smaller eight-rowed maize, and domestic beans. Artifacts here are characterized by shouldered straight-stemmed concave- or straight-based projectile points, contracting-stemmed projectile points, well-made small end scrapers, choppers, flake scrapers, and manos and metates. In addition, preserved remains include coiled and twilled basketry bags and sandals. Indications of a specialized highland Archaic hunting pattern were also encountered at this site. Wimberly and Eidenbach (1981:2) found evidence of large game hunting and butchering of mule deer, antelope, bighorn sheep, and bison.

TESTING RESULTS AT HIGH ROLLS CAVE

Steven C. Lentz and Dorothy A. Zamora

The purpose of the testing program was to determine the amount and extent of subsurface materials at High Rolls Cave (LA 114103). The front part of the cave was removed during the initial construction of U.S. 82 and there was some question about the extent of cultural materials that remained intact at the site.

Testing at the cave confirmed the existence of perishable cultural materials in the deposits remaining in the cave. The cultural layer explored during the limited testing at the site also contained lithic artifacts, charcoal, and faunal materials. No human bone was encountered; however, a small number of animal bones was recovered. A Middle to Late Archaic projectile point and possible eroded basket that contained some bone and shell were found in Test Pit 2. A possible prayer stick was photographed, drawn, and then returned to the Lincoln National Forest for curation.

High Rolls Cave has an oral history of containing human remains. Al Bassett (deceased), in an interview with Pete Eidenbach in the 1970s, states that during the 1940s construction of U.S. 82, many perishable items and human bone were picked up after the initial blasting at the cave. Interviews included several other men who were in the area at the time. These oral histories are important because they are the only accounts available on the original size and cultural contents of High Rolls Cave.

Methods

The limited testing program included mapping the cave, the documentation of numerous pot holes that have been dug into the deposits, and recovery of materials that were eroding from the north edge of the cave. A main datum was established near the west extent of the cave and a subdatum near the center of the remaining deposits. Three test pits were excavated (Fig. 2). Test Pit 1 was located toward the center of the cave to determine depth of cultural materials in that area. Test Pits 2 and 3 (contiguous) were located proximate to a large pot hole to investigate cultural remains that might have been impacted by pot hunting in the cave, as well as to determine the depth of the deposits in that area. Excavation in both test pits proceeded in 10-cm arbitrary levels and natural strata were identified within these levels.

Test Pit 1

Test Pit 1 was excavated in three arbitrary levels. Level 1 consisted of soft silty sand with a few pebbles and limestone spalls from the ceiling of the cave. The southwest quadrant consisted of a hardened caliche area. Just north of this area were two medium-sized limestone fragments, blackened on the underside, and a good number of charcoal fragments; the extreme northeast corner contained a large charcoal pocket. One lithic artifact, one historic glass fragment, one macrobotanical sample, radiocarbon samples, and one rodent bone were collected from the fill. Some cow dung was noted in the fill and may have been imported into this locale to provide fuel during historic times.

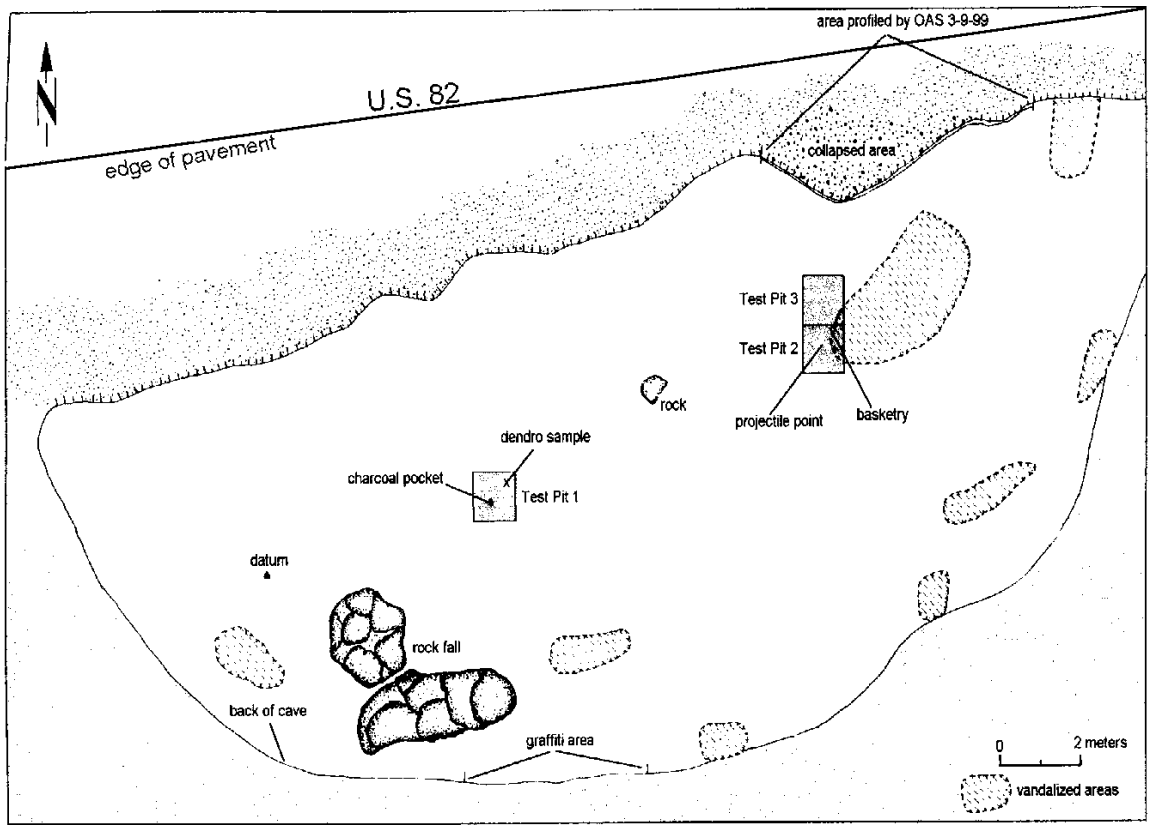


Figure 2. Plan view of High Rolls Cave.

Ethnohistorical sources identify many types of animal manure as an efficient fuel. Pete Eidenbach suggested that the "cow pies" may in fact have been bison droppings, which were also used in nearby Fresnal shelter by Archaic groups. The lenses of charcoal might be microlenses representing hearths as found in Fresnal Shelter. These hearths had very subtle and convoluted microstratigraphy; thermal features were represented by pockets of white ash and charcoal.

The Level 2 soil was soft, silty sand whose color was lighter than that of Level 1. A tree-ring sample was collected from the northeast corner of this grid; however, this sample did not yield datable material. A small charcoal lens was found in an area of dissipated ash that was only 1 cm thick. In the southeast corner, just below the level, there were clasts of hard limestone that continued across three-quarters of the grid. Below the limestone level was soft, silty sand that continued until the bottom of Level 2. A large chunk of yellowish, fine-grained limonite was near the northwest corner with a yellow lens of soil eroding from the fragment. Only one lithic artifact in the southern portion of the grid was recovered from the fill. Also, a soft white caliche pocket, about 2 cm thick, was visible in the extreme northeast corner of the grid, running along the entire north wall and varying from 1 to 2 cm in depth.

The Level 3 soil was compacted, silty sand about 2 cm thick and overlapping layered limestone slabs. A black chunk of charcoal was embedded in the extreme southwest wall. At the base of the level and along the northern wall was a pocket of limestone or dark gray, fine-grained siltstone. Two bone fragments and a chert biface were recovered in the fill above this pocket. The remaining fill was devoid of charcoal. The fill continued below the limestone stratum on the south wall. The soil was a soft, moist, light brown sand, and undercuts the limestone layer. Along the north wall, soft silty sand underlies a darker brown organic sand lens with roots and also mixed with either white ash

or caliche. It appeared very soft and may have been disintegrating limestone.

The following level was sterile and void of cultural materials. The entire level was extremely rocky and covered with small, overlapping limestone spalls. A pocket of dark-gray siltstone was located in the northwest corner. The fill consisted of large, medium, and very small siltstone fragments.

Test Pit 2

Test Pit 2 was placed along the western edge of a large pothole. It was excavated in five arbitrary 10-cm levels containing three discrete strata. The soil was dry silty loam.

The first level (Level 1) was surface stripped and the soil was a dry, silty loam. The removal of the disturbed soil ranged from 10 to 30 cm and, because of the outcropping bedrock, it was impossible to maintain strict 10 cm levels.

Level 2 represented a definite break whereby a layer of compact caliche was laying on top of the cultural soil. No artifacts were present above the caliche. After removing the calichified layer, the soil below became darker. Rodent burrowing occurred throughout the grid and a rodent nest was also present. No artifacts were encountered.

Level 3 was classified as a semicompacted silty loam with some calcium carbonate pebbles and charcoal flecking. The soil changed in both color and consolidation (more compacted) to the west. There were large limestone rocks in this area, but they were missing to the east. No artifacts were present.

Level 4 consisted of silty loam. Cobbles on the west one-quarter of the grid slope to the east. The pothole disturbance was confined to the northeast quarter. One basalt projectile point was encountered at the bottom of the level. Rodent disturbance continued throughout this level. Charcoal became increasingly smaller as the excavation continued.

Level 5 consisted of dry, disturbed silt. On the edge of limestone bedrock or ceiling spall were some woven materials, possibly a basket or matting. It was confined to a 22 cm north-south by 30 cm east-west area. The fibers were matted with what seems to be yucca strips. The strips were 10 cm in width and were oriented north-south and east-west in relation to the grid unit. Mixed with the matting were leaves and piñon nuts. There was an object subsequently identified as a possible prayer stick *(paho)* or a root intermingled with the fibers. Charcoal was also present, and there was a concentrated ash area along the fibers. Charcoal was also present, and there was a concentrated ash area along the southeast one-quarter of the grid. The soil around the woven material was silty and dry. Rodent disturbance was evident throughout the grid. Faunal bone fragments were also associated with the basket. A C-14 sample was collected from this area. The ash pit abutted the limestone rocks and contained some charcoal. Although no occupational surface was encountered, it is possible that a surface was nearby. The excavation in Test Pit 2 was stopped at the level of the fiber artifacts. To continue to expose the remainder of these materials, a contiguous unit was partially opened on the north side of Test Pit 2.

Test Pit 3

Work on Level 1 consisted of surface stripping 2 cm off of the top of this grid. Soil was grayish silt and disturbed by foot traffic and pothunting.

The basket or matting was located 4 cm below where the surface stripping ended, in Level 2. Only the southwest one-quarter of the grid was excavated in order to remove the basket. The excavation ended when it was determined that significant cultural materials were present and further testing was not warranted.

STABILIZATION AND DATA RECOVERY PLAN FOR HIGH ROLLS CAVE

Yvonne R. Oakes

Introduction

High Rolls Cave (LA 114103) is located in a north-facing canyon wall 7.8 m directly above U.S. 82 within the highway right-of-way at an elevation of 1,896 m (6,220 ft). The floor area of the cave is D-shaped, measuring 23 m east-west by 9 m north-south and 4-4.5 m at its greatest height. It possesses an area of 154 sq m. The surface of the cave is covered with ashy, silty soil and numerous potholes are present. A testing program by OAS revealed the presence of intact cultural deposits to a depth of at least 65 cm. The front edge of the cave extends for 23 m and has been cut by early construction activities for U.S. 82. Depth of the deposits along the lip edge are approximately 40 cm thick. Cultural material is eroding downslope from this exposed edge, including matting, possible basketry, animal bone, charcoal, and some lithic artifacts. No pottery was observed on the site. A Middle Archaic projectile point and a radiocarbon assay place the site date tentatively between 1260 and 905 B.C. with possible multiple occupations.

Cultural material along the cut edge of High Rolls Cave are currently eroding out of the cave and falling down to the ground surface near the roadway. Rock spalls from the cave roof are also occasionally falling into the U.S. 82 highway because of vibrations from passing heavy trucks. Additionally, recent pothunting of the cave floor is occurring because of the cave's high visibility to moving traffic.

Subsequent to the testing program, High Rolls Cave has been placed in the Archaeological Site Stabilization and Protection Project, administered by the NMSHTD, so that steps may be taken to stabilize the site edge and to prevent further rock from falling into the highway corridor. Consultations with the Lincoln National Forest archaeologist resulted in the production of a proposal to stabilize and protect the site. Therefore, this data recovery plan is specifically oriented toward the preservation of the cultural integrity of High Rolls Cave.

Site Orientation

While archaeological excavations have never actually been undertaken at High Rolls Cave, there is considerable public knowledge regarding the cave and the potential for significant cultural deposits to be present. Perhaps most importantly, it is located opposite the narrow Fresnal Canyon from Fresnal Shelter and seems to temporally date to the same Late Archaic period. Fresnal Shelter (LA 10101) has been previously excavated (Wimberly and Eidenbach 1977, 1981) and is well known for its early cultigen dates on Chapalote maize and domesticated beans. A number of fairly rare cultural materials not usually found outside of dry, protected shelters were removed from the site, including basketry and sandals. The number of projectile points and specialized lithic tools recovered are thought to be indicative of a specialized Archaic hunting strategy focused in the surrounding mountains. Large fauna on the site included mule deer, antelope, bighorn sheep, and bison. Occupation may have been multiseasonal with repeated use over time.

High Rolls Cave is smaller in size and is north facing, indicating a possibly poor choice for

winter occupation. Hearths were not found during testing but are likely present, given the amount of charcoal observed. Artifact analysis on the limited lithic material from the testing program suggests that meat parts were transported to the cave for consumption. Botanical items recovered include yucca matting, piñon and juniper remains, goosefoot seeds, mesquite, ash, and Mormon tea. Faunal specimens recovered include deer, cottontail, dog, turkey, and a fresh water mussel. Occupation may have been shorter or strictly seasonal at High Rolls Cave in comparison to Fresnal Shelter. However, only 1.9 percent of the cave (three test pits) was examined through testing and a much broader spectrum of floral and faunal species may be present.

Research Focus

Only a portion of the cave, along the cut edge, is in danger of eroding downslope. Therefore, the stabilization and protection plan calls for excavation of cultural deposits only along this edge for a distance of approximately 20 m. Excavations will extend 1-m into the cave interior and to the bottom of the cultural deposits. The Lincoln National Forest archaeologist has requested that any cultural items within this 1-m limit that also extend beyond it into the cave interior, likewise be retrieved. Upon completion of the linear excavation of the 20 m of fill by OAS, and upon receipt of archaeological clearance by the NMSHTD, State Historic Preservation Office, and the Lincoln National Forest, the OAS will contract with the Abandoned Mine Land Bureau of the State of New Mexico to construct a locked metal grate over the cave opening. Footings for the grate will be placed along this excavated edge of the cave. The interior of the grating will be lined for approximately 1 m in height with material approved by the Lincoln National Forest Service for the purpose of preventing erosion of remaining cultural materials through the grate.

Because excavation efforts will be limited to 12.9 percent or 20 sq m of the cave, the research will focus on issues that can be addressed with this limited database. Sites in the immediate vicinity of High Rolls Cave are mostly identified as lithic scatters of unknown cultural affiliation. No permanent habitation units have been recorded in this mountainous area. The only substantial site is Fresnal Shelter, a Late Archaic special-use occupation. The unknown lithic scatters may possibly relate to Fresnal Shelter or High Rolls Cave subsistence activities. Therefore, research will focus on Archaic adaptations in Fresnal Canyon and comparison of High Rolls Cave with Fresnal Shelter. The main research premise is that if there is proximate contemporaneity between the two shelters, then subsistence adaptations should be similar. If, however, there is contemporaneity but seasonal differentiation in the use of the shelters, remaining subsistence items should vary. If there is diachronic change in the use of the cave, then differing adaptations through time should be apparent. Comparison of recovered artifacts from High Rolls Cave with Fresnal Shelter should, therefore, greatly broaden our knowledge of Archaic subsistence patterns in this particular region of the Southwest.

Research Domains

Areas of research concerns include chronometric definition, comparisons of subsistence adaptations, and Archaic settlement patterns in the region.

Chronometric Definition

The temporal relationship between High Rolls Cave and Fresnal Shelter is critically important in understanding variability or statics in Archaic adaptations in the canyon. What is the length of time each site was occupied? When and how was the cave used and does it represent a single occupational period or contain multiple occupations? And is it on a daily, seasonal, or yearly basis? A seasonal or yearly occupation might be evidenced by the presence of multiple hearths, storage facilities, types of resources utilized, and overlapping features.

Natural stratigraphic levels will be maintained in order to delineate any differing occupation levels. Radiocarbon and dendrochronological samples will be taken from each grid unit if possible. If intact hearths are found, we will also obtain archaeomagnetic samples. Materials from pack rat middens, if present, may also provide information on the paleoenvironment of the area. If Archaic projectile points are found, they will be assigned a temporal phase, if possible. The defining of absolute dates will produce a clearer understanding of the duration of Archaic use of Fresnal Canyon.

Subsistence Adaptations

The analysis will focus on the types of resources used by the occupants of the cave. Subsistence strategies such as foraging, collecting, and hunting will be evaluated in light of resources recovered. Seasonality of resource availability will also be determined as well as determining the source of specific resources such as lithic raw material and trade goods, along with subsistence items. Did site residents go far for their needs or were most items available close to the cave? We will also pay particular attention to the balance between utilized floral and faunal resources as a key to understanding seasonality of procurement and as an indicator of potential resource stress. Do resource indices change from shelter to shelter or year to year? Were resources processed on site or elsewhere prior to returning to the cave?

Ground stone implements may retain some of the materials that were processed on them and suggest what food items were being used. Hearths, roasting pits, and storage pits are another source for recovering subsistence items.

Settlement Patterns

Research will examine structural diversity between High Rolls Cave and Fresnal Shelter and make comparisons with other Archaic and early Formative sites in the region. Is there reconstruction or remodeling of features? Are there numerous storage facilities? Are hearths formally constructed or expediently prepared? Are there specific work areas? Specific tasks carried out on the site can possibly be determined from the composition of the trash deposit and number and type of features present. Comparisons can then be made with the data from Fresnal Shelter. As Akins (1997) asks of the material from Fallen Pine Shelter near Ruidoso, were resources hunted or collected and then returned to the caves as a residential loci, or were the caves overnight or short-term campsites? Or did site occupants seasonally use the cave as part of seasonal rounds? And also importantly, what was the geographic extent of the Archaic settlement system within Fresnal Canyon?

We seek to learn through this data recovery plan how Archaic peoples utilized Fresnal Canyon. Were resources in the surrounding environment abundantly and predictably available? Are there any identifiable patterns of resource utilization by site residents? And lastly, is residency of High Rolls Cave and Fresnal Shelter basically contemporary?

Field and Analysis Methods

The following field and analysis techniques will be used to extrapolate the specific structural and temporal data required by the data recovery plan. This includes an accurate chronometric assessment of the site through various dating mechanisms such as radiocarbon analysis, dendrochronology, and archaeomagnetic sampling. We also plan to collect sufficient macrobotanical and palynological samples to evaluate subsistence adaptations. These will be taken from surfaces and feature walls and fill. The chronometric data will be taken from burned structural material, hearths, pit fill, and organic material. In addition, the collection of adequate floral and faunal remains is vital to our understanding of subsistence adaptations.

Prior to entering the field, a professional conservationist will be hired to advise the crew on the handling of fragile materials. The recovery of possible basketry and matting during the testing phase makes it likely that similar materials will be found during data recovery.

Field Methods

A primary datum will first be established from which all depths will be taken. A leveled string at datum height will be permanently anchored from the west to the east wall for ease in taking measurements. From this, a linear 1-by-1-m grid system will be imposed along the front edge of the cave. Artifact collections will be made from within these 1-m grid units. Hand tools only, such as trowels, small geology picks, brushes, and dental picks will be used for the excavation of cultural materials and features.

Excavation units will be started initially in 10-cm levels until natural or cultural stratigraphic levels are evident. If cultural breaks are defined, excavations will continue in levels determined by the depth of the stratum. If an artifact extends into the adjoining interior fill of the cave, an appropriate amount of soil will be removed in order to extract the complete artifact.

Soil recovered from excavation units will be screened through ⅛-inch mesh cloth and all artifacts will be bagged by grid and level. However, artifacts recovered from use surfaces will be mapped in place and collected separately. Pollen and flotation samples will be collected from all cultural strata. In addition, an off-site pollen control sample will be taken for comparison with site samples. Individual excavation forms will be completed for each level excavated within each grid, giving description of level, depth of excavation, number and types of artifacts recovered, and soil color and type based on the Munsell scale. All screened dirt will be used to fill in the several large potholes within the cave; however, black plastic will first be laid down in order to separate the screened deposits from the original cave contents.

Plan views and profiles will be drawn of all features. A site profile map will be drawn extending along the entire back edge of the excavation units. The interior of the cave will also be mapped with a transit and stadia rod. Features will be photographed before and after excavation.

Should any human remains be discovered, the field treatment of these and any other sensitive cultural materials will be based on the Museum of New Mexico Rule 11, "Policy on Collection, Display, and Repatriation of Culturally Sensitive Materials," adopted January 17, 1991, and other applicable state and federal regulations. If human remains are uncovered, appropriate law enforcement agencies, the Lincoln National Forest, and the Mescalero Apache Tribe will be notified immediately. 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

The laboratory analysis will be conducted by 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 a professional conservator.

Lithic Artifacts. All lithic artifacts will be analyzed for material type and texture, artifact type, breakage pattern, use, and presence of thermal treatment. Attributes to be monitored on formal and informal tools include edge angle and shape, type of modification, and 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 the reduction technology, tool production and use, and the raw material procurement strategies occurring on the site. The presence of nonlocal, or exotic, raw materials in the assemblage can inform on the settlement or trade patterns of the cave occupants. The general type of materials selected for tools by Archaic peoples are usually of high quality because of the need for longer lasting, multipurpose implements, easily carried from place to place. Therefore, reduction strategies of Archaic groups should involve more labor investment in tool production of these multiuse implements. Large bifaces and projectile points should be part of the tool assemblage if hunting is a focus of the cave occupants' adaptation. Discard items should include a high percentage of biface chipping flakes, if tool manufacture occurred in the cave.

Comparison of the lithic artifact data with Fresnal Shelter and the smaller lithic artifact scatters in the region will hopefully assist in the identification of specific manufacturing techniques and use patterns that may help identify the varying subsistence strategies of the Archaic groups in the area.

Ground Stone. Any recovered ground stone will be analyzed for morphology, material type, manufacturing process, and for type of material processed on them. Recent studies by OAS have allowed for the identification of a number of economic materials still remaining on the ground stone through pollen washing of the stone and subsequent specialized analysis of the residue. Therefore, any ground stone in primary context and protected from the weather will be pollen washed. While it is thought that length of manos predicts use as processors of corn (Hard 1990), the type and direction of striations may be a more useful indicator of mano use (Adams 1999).

Faunal Remains. The faunal analysis will focus on the identification of species, the season in which they were procured, and the portions represented to assist in determining species and parts used by the Archaic populations of the two caves. Extensive processing of bone parts, such as crushing and marrow extraction, may be indicative of food shortage (Chatters 1987:344). If there are temporal differences in the occupations of the caves, utilization of differing fauna through time can inform on the availability and abundance of faunal resources in the region and assist in the determination of the presence of any resource stress. Faunal indices as developed by Szuter and Bayham (1989) will be used for comparing faunal assemblages both within and outside of Fresnal Canyon.

Floral Remains. Floral remains will be identified by species, when possible, and seasonality of use calculated in order to determine the types of plant resources used by cave occupants. Potential distance from procurement sites to the cave will also be determined so that subsistence strategies can be better understood. Season of use of the cave can be determined largely on the basis of macrobotanical remains present; therefore, macrobotanical and palynological samples will be taken from all cultural features encountered, and a number of cultural lenses. There is the potential for

greater quantities of perishable material to be present in the cave than found on open-air sites. Possible matting and basketry were retrieved from the test pits at High Rolls Cave. Nearby Fresnal Shelter yielded 50 different species of plant remains (Bohrer 1973:211-218). An ethnobotanist will visit the site area and map floral species found in Fresnal Canyon today. Specialists will be used to undertake the laboratory analysis of all plant resources.

Human Remains. If human remains are uncovered, their treatment and disposition will be determined by the Mescalero Apache Tribe with concurrence by the Lincoln National Forest. The main goal of the skeletal analysis will be a nondestructive study to add to the limited database on Archaic populations in southeastern New Mexico. The analysis will include standard metric studies, aging and sexing of the remains, and documentation of pathologies, particularly those related to food stress. If permission is granted by the Mescalero Apache Tribe and the Lincoln National Forese, DNA samples will be taken for positive determination of cultural affiliation.

Research Results

The final data recovery and analysis report will be published in the Museum of New Mexico's *Archaeology Notes* series. The report will present the results of the excavation, all analyses, and interpretation of the data. It will include photographs, site and feature maps, data summaries, and statistical manipulations. Field notes and maps, analytical data sheets, and photographs will be deposited with the New Mexico Cultural Resource Information System, located at the Laboratory of Anthropology in Santa Fe.

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