MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

TEST EXCAVATIONS AT EAST RIDGE PUEBLO (AR-03-06-03-373) ON THE GILA/APACHE NATIONAL FOREST

by
Yvonne R. Oakes

ARCHAEOLOGY NOTES 135

SANTA FE 1993 NEW MEXICO

PREFACE

The Office of Archaeological Studies of the Museum of New Mexico has initiated a policy of publishing outside reports that we believe would be of interest to scholars and the general public. OAS funding is not available for the publication of these reports; therefore we are making them available just as they have been received, with minimal editing or amendations. Our hope is that, by making them public, they will increase our existing knowledge of various aspects of New Mexico prehistory and history. This report is one of those unpublished doucments that we are making available to the interested public.

ADMINISTRATIVE SUMMARY

The Office of Archaeological Studies (OAS), Museum of New Mexico, received a cost-share grant (06-93-025) from the Gila/Apache National Forest to conduct a mapping and testing program at East Ridge Pueblo in Pueblo Park Campground near Reserve, New Mexico. The U.S. Forest Service plans to open the site as part of an interpretive program at the campground. Twelve days were spent in the field on the project.

The site, LA 21153, dates to the Early Tularosa phase of the Mogollon culture with a corrected and calibrated date averaged to A.D. 1166. Situated on a gently sloping ridge are two cobble-walled room blocks and a large kiva with additional surrounding rooms. The total number of rooms may reach over 20. An earlier pithouse component lies immediately to the north and east of the room blocks. Several nearby rock outlines of indeterminate association are also present.

The above areas were tested by OAS personnel for depth of cultural fill, presence of features, and degree of preservation. The testing revealed that rooms are partitioned by masonry walls standing at least 90 cm high and are in excellent condition. One room contained much burned corn and cob fragments. The kiva is masonry-lined and plastered along its lower depths. It extends 1.65 m below ground surface. An adjoining room extends 1.05 m below the surface. The kiva is approximately 10 m wide. Ceramics and lithic artifacts are plentiful throughout the site despite heavy collecting by campground visitors.

Systematic auger tests, to look for possible pit structures, supplemented the test pits in areas outside of the room blocks. Heavy charcoal concentrations were located but no structures were found. The site was mapped in detail with a transit and stadia rod.

East Ridge Pueblo has the potential to yield important information on subsistence, settlement layout, and social adaptations during the Reserve phase in this area of the Mogollon Highlands. The depth and preservation of the site suggest that the potential for data retrieval is high and that research questions can be addressed. Recommendations for further work at the site are therefore submitted with this report.

MNM Project 41.559
Gila National Forest Agreement 06-93-025

CONTENTS

Figures

Tables

INTRODUCTION

Between May 24 and June 4, 1993, the Office of Archaeological Studies (OAS), Museum of New Mexico, conducted a limited testing and mapping program of East Ridge Pueblo, Pueblo Park Campground (Figs. 1 and 2) for the Gila/Apache National Forest under provisions of a Cost-Share Agreement (06-93-025). The program was administered by Cathy Dodt-Ellis of the Luna Ranger District and Yvonne Oakes, OAS.

The Gila/Apache National Forest plans to open portions of the East Ridge Pueblo (LA 21153; AR-03-06-03-373) as part of an interpretive program at the campground. Preliminary investigations conducted by the OAS team of Yvonne Oakes, Dorothy Zamora, and Christine Sterling called for the testing of the Reserve phase site to determine depth of cultural material, significance of materials, and degree of preservation. A detailed site map was also produced with the use of a transit and stadia rod.

We acquired several volunteers from the nearby campground and from local Reserve residents. Their help was much appreciated. These include Chris Cordova, Cathy Dodt-Ellis, Maureen Klement, Antonio Torres, and Rebecca Vaughn. Visitors to the site numbered 22.

The results of the limited testing program are assessed and recommendations for further archaeological work are presented. The legal description of the site is given in Appendix 1.

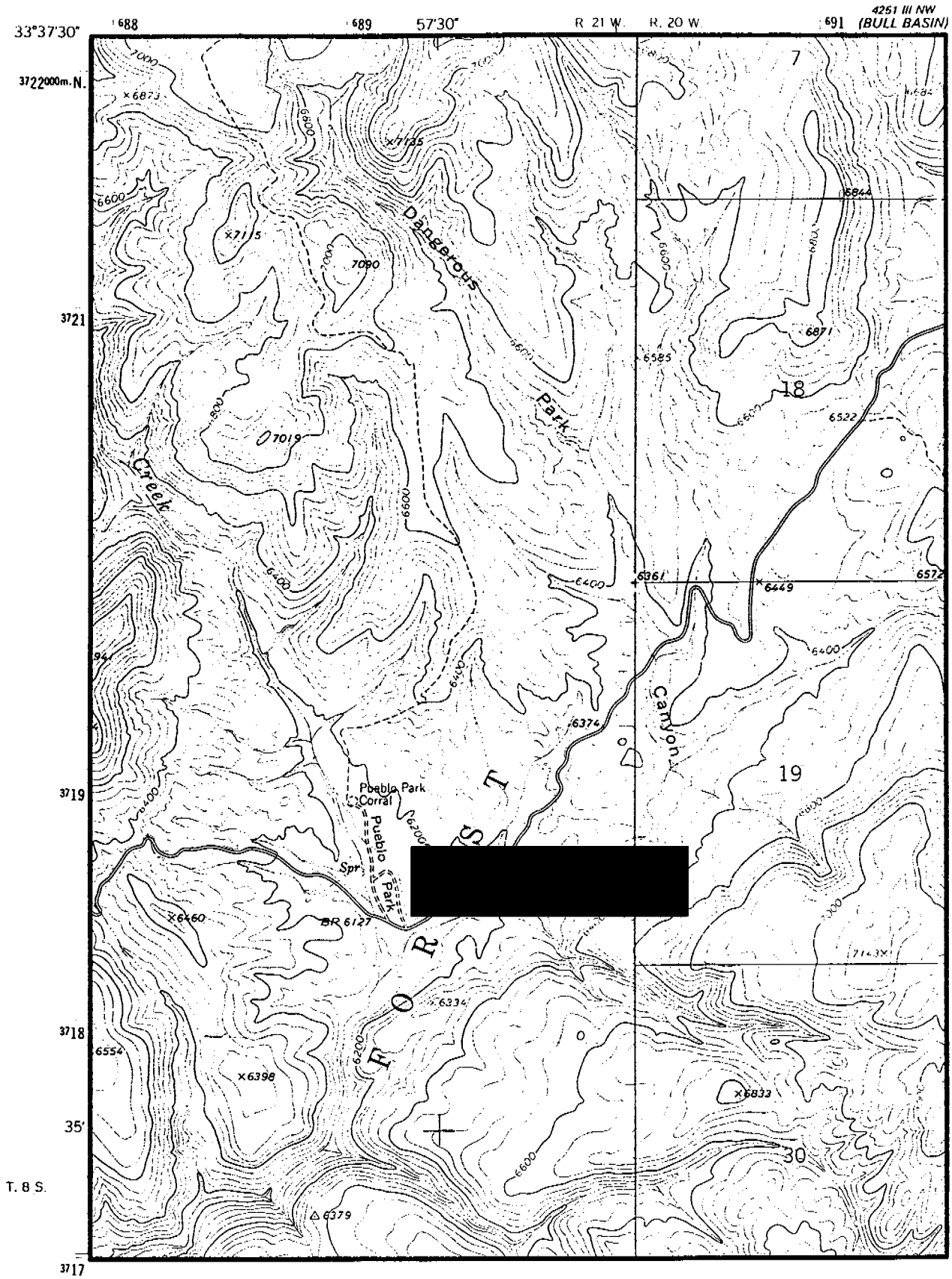

Figure 1. Project location map, Saliz Pass Quadrangle, 1963.

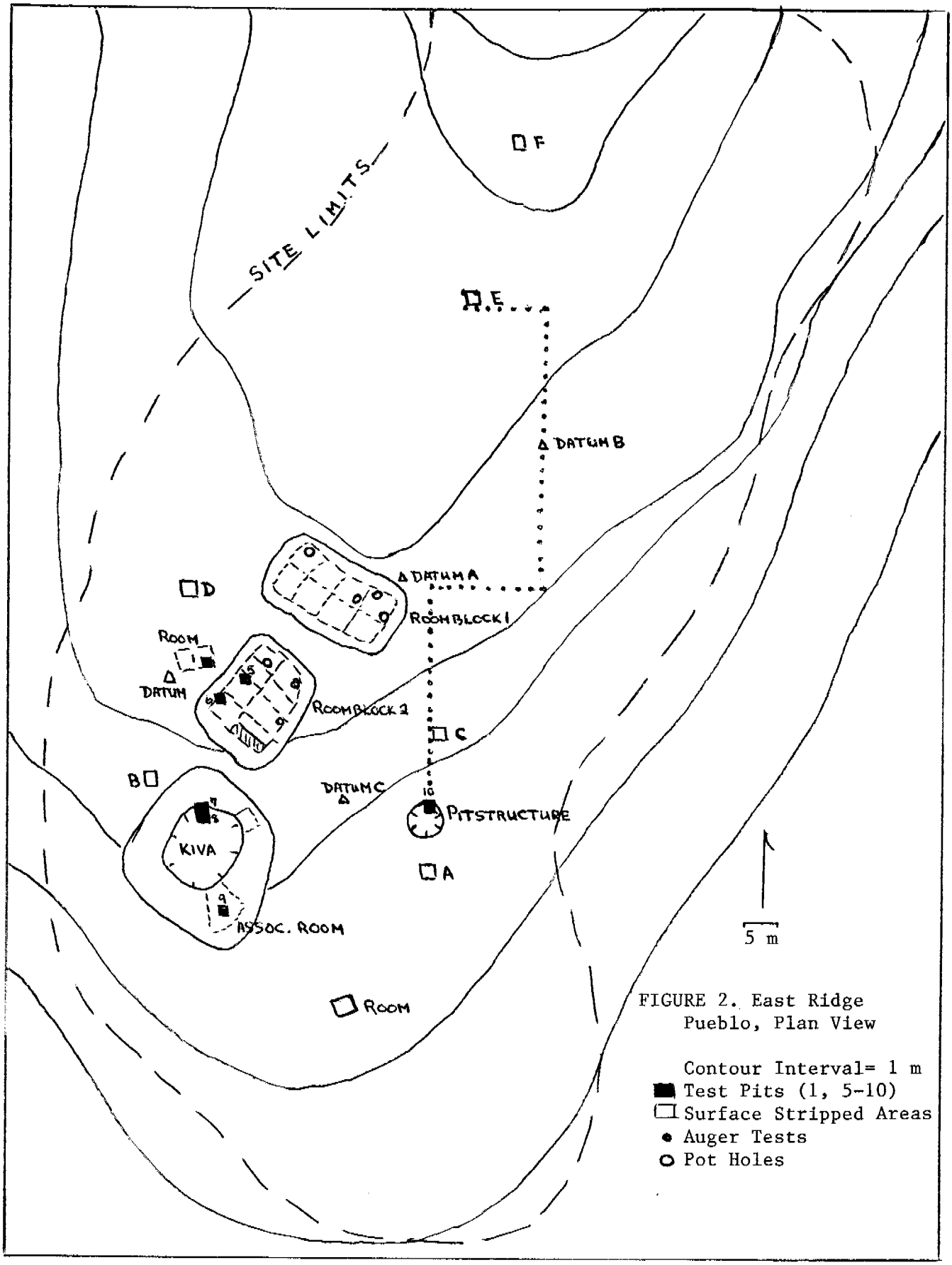

FIGURE 2. East Ridge Pueblo, Plan View

Contour Interval= 1 m
Test Pits (1, 5-10)
Surface Stripped Areas
Auger Tests
Pot Holes

ENVIRONMENT

East Ridge Pueblo is located on one of many low ridges extending along both sides of Pueblo Creek at an elevation of 1890 m (6200 ft) in the Apache National Forest near Reserve, New Mexico. Many ridges and associated small drainages dominate this area. Larger mountains such as Brushy and Saddle mountains are nearby and constitute parts of the San Francisco Mountains. Pueblo Creek, the Blue River, and the Saliz Canyon drainage all provide a fairly dependable water source for the area. The pueblo sits on a ridge adjacent to an [redacted] that [redacted] A spring lies immediately to the west, in Pueblo Creek, which wild animals are known to frequent.

The site lies within the transition zone between the Colorado Plateau and the Basin and Range physiographic province. The surrounding terrain is rough and broken. Steep-sided mountains intermingle with plateaus and mesas, steep canyons, and narrow valley bottoms. Heavily wooded areas are common. The site lies within a pinyon-pine-juniper woodland. Higher pine and fir forests are close by.

Within this transitional zone, geologic formations are mostly Tertiary volcanic rocks. Materials consist of andesite, basalt, rhyolite, shale, tuff, and some sandstones and siltstones (Berman 1979:4). Soils are forming from a wide variety of mixed igneous and conglomerate rocks. The soils are generally shallow, but there are pockets of moderately deep soils. General depth is 38 to 152 cm (15 to 60 in) with a moderately high content of organic material. Surfaces are frequently gravelly or rock covered, however, they do support a good amount of vegetation.

The native vegetation includes ponderosa pine, pinyon, juniper, and oak. High passes also support aspen and Douglas fir. Shrub cover includes sacahuista, mountain mahogany, rabbitbrush, chamisa, and winterfat. Grasses that may be found are mountain brome, sideoats grama, blue grama, black grama, Arizona fescue, blue grass, pine dropseed, mesa dropseed, little bluestem, bush muhly, and three-awn.

Wildlife that may be found in the area includes mule deer, white-tailed deer, brown bear, mountain lion, bobcat, coyote, javelina, cottontail, jackrabbit, beaver, porcupine, and small rodents and lizards. Merriam's turkey and various hawk species are two of the birds frequently observed.

The climate is characterized by warm summers and cool-to-cold winters. The winters tend to be drier, while summer moisture from the Gulf of Mexico brings heavy, brief thunderstorms from July through September. However, precipitation can vary greatly from year to year. The average annual rainfall for the Reserve area is 350 to 380 mm with up to 600 mm for the highest mountains (Gabin and Lesperance 1977). There are approximately 120 frost-free days at Reserve (Maker et al. 1972:6-7). Recorded temperatures in the area average from 1 degree Centigrade in the winter to 24 degrees Centigrade in mid-summer.

REGIONAL PREHISTORY

Paleoindian Period (9500-6000 B.C.)

No Paleoindian sites have been located in the vicinity of the project site. Sites have been recorded on the Plains of San Agustín, 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, however. 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 edge of playas. Isolated diagnostic projectile points are also found in this setting.

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

Archaic sites in the project area 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 the Gila/Apache National Forest. Recorded sites include rock shelters, caves, lithic artifact scatters, and one pit structure site. One open site recently excavated by OAS has stratified deposits, datable hearths, and a roasting pit. At another site, over 16,000 lithic artifacts were recovered, including at least 400 San Pedro points, and dates to a weighted and corrected date of A.D. 60. Occupied caves at this time include Tularosa Cave (Martin et al. 1952), O Block Cave (Martin et al. 1954), and Bat Cave (Dick 1965).

Beckett (1973) believes that cave sites were used for winter occupation, while lower elevation dune sites were used from spring through fall. However, Heller (1976:18,21) 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.). The Cazador phase may only be valid for the Arizona area,however. 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 $\pm$ 680 B.C. has been obtained for the Wet Leggett Arroyo site (Martin et al. 1949); 3981 $\pm$ 310 B.C. for the Chiricahua component at Bat Cave (Dick 1965:105), and 272 $\pm$ 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).

The Archaic period ends with the introduction of pottery. No explanation of the adoption of this significant technological adaptation 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 transition between the Archaic and the Mogollon period is generally marked by the appearance of brown ware pottery. During the Mogollon period, we see the use of pithouse dwellings with a 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. A.D. 200-500), Georgetown (A.D. 500-700), San Francisco (A.D. 700-900), Three Circle (A.D. 900-1000), Reserve (A.D. 1000-1100), and Tularosa (A.D. 1100-1350). 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 in this area as either Pithouse or Pueblo phase, with the division 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 near the project area.

Early Mogollon sites of the Pinelawn and Georgetown phases that have been excavated near the project area include Luna Junction (Peckham 1963) recently reexamined by OAS,

Mogollon Village (Haury 1936), Pine Lawn Camp Pithouse (Rinaldo n.d.), Promontory Site (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 is currently being reexamined by 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).

Many researchers believe most early Mogollon sites tend to be located in elevated areas such as mesa tops, high knolls, and ridges. An OAS project is currently assessing the validity of this statement through recently acquired data from 22 sites in the nearby area.

Sites of the Late Pithouse period, the San Francisco and Three Circle phases, that have been examined near the project 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), the Switchback site (Peckham 1957), Three Pines Pueblo (Martin et al. 1950), Wet Legettt 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.

The presence of Mogollon ceramics are usually sparse on sites during the Pinelawn phase. Initial pottery consists of a plain brown ware called Alma Plain, 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.

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

By the Reserve phase (ca. A.D. 1000) pithouse dwellings give way to above-ground structures. Sites of the Reserve phase that have been excavated 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 extend further into previously unoccupied areas. 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 Minnis (1981) suggests that such pottery developed locally. The OAS research project for 22 sites along U.S. 180 is currently studying the origins of these pottery types.

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 near the project area are Higgins Flat Pueblo (Martin et al. 1957), the Hough site (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. Sites range from one or two rooms to multistoried structures of over 100 rooms. Sites generally consist of 20 to 50 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, is actually thought to have been 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/Apache 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) or to the Little Colorado area of Arizona.

SITE DESCRIPTION

East Ridge Pueblo (AR-03-06-03-373) is situated on a low finger ridge directly [redacted] on unplatted lands of the Gila/Apache National Forest 19 km southwest of Reserve, New Mexico in Catron County. It sits at an elevation of 1,896 m (6,220 ft) in a pinyon-pine-oak environment. [redacted], an intermittent but fairly dependable drainage, flows [redacted].

In 1907, Hough explored the Gila and San Francisco river drainages and included parts of adjacent streams such as Pueblo Creek. He mentions two well-known sites on nearby Saddle Mountain and at Hinkle Park, but does not specifically mention East Ridge Pueblo. The site was initially mapped by William Turney in 1972 and 1973 and recorded again by him in 1979. In 1987, Richard Newton of the Reserve Ranger District recorded the site for the Forest Service. No official excavations have been carried out at the site; however, Turney did do quite a bit of sampling.

The overall condition of the site, as assessed during the testing program, is very good to excellent. Pothole excavations have been carried out on the site over the years, but no rooms are completely excavated and many remain untouched. The site is, however, easily accessible by the general public and is in danger of further destruction.

East Ridge Pueblo consists of cobble-walled structures of at least 10 rooms and an adjoining kiva (Figs. 3 and 4). These are separated into three room blocks and one possible isolated room. The room blocks cover an area of 60 by 35 m. However, there is an extensive scatter of sherds and lithic artifacts that extends around the room block for a total area of 180 by 80 m. Because of the early brown wares present in this wide area, it is possible that earlier pithouse structures may be present on the site.

Artifacts number in the thousands and include brown ware sherds of the Alma series, various corrugated and smudged styles, and white wares, including Reserve Black-on-white. Lithic materials are also numerous and are of obsidian, rhyolite, chalcedony, basalt, and chert. Most lithic materials on the surface are small, tertiary flakes. Subsurface testing yielded larger flakes and larger ceramic fragments as well. Metates and manos were present on the surface in 1972 when Turney visited the site. The cobble room block style of architecture, the Tularosa phase ceramics present, and three radiocarbon dates recovered from testing, place this site into the Early Tularosa phase of the Mogollon Culture with a corrected and calibrated date averaged to A.D. 1166.

Hand-drawn maps by Turney and Newton were not clear as to the exact extent and nature of the site. There were several wall alignments drawn on Newton's map of 1987 that were not shown on Turney's 1972 map. New maps were produced by the OAS crew with a transit and stadia rod.

Little was known about the subsurface nature of East Ridge Pueblo or the extent of damage by pothunters to the site prior to the testing program by the OAS. The following section details the work done by OAS at the site.

TESTING METHODS AND RESULTS

Testing Objectives

The principal objective of the testing program at East Ridge Pueblo was to make an assessment of the archaeological site and its related material goods regarding: (1) the site's potential to provide important information on local and regional prehistory, and (2) the site's potential to be incorporated into an interpretive program by the U.S. Forest Service at Pueblo Park Campground.

This archaeological assessment consists of Phase I in a possible three-phase series. Phase II would involve excavations in those areas likely to provide important archaeological information, based on findings from Phase I. Phase III would be conducted by the U.S. Forest Service and includes stabilization of the site and preparation for interpretation.

The following section provides the U.S. Forest Service with a detailed evaluation of the East Ridge Pueblo.

Testing Methods

Prior to any site mapping or subsurface testing, the entire ridge area was examined for evidence of additional cultural features and to determine the artifactual limits of the site. These limits were flagged and used when producing the site map (Fig. 2). Photographs of the site were taken before any excavations took place. A primary site datum was established and designated as the northwest corner of Grid 100 North/100 East. A main baseline was run on magnetic north through the datum and several east-west baselines were established off of the primary one. Subdatums were also set up along these secondary lines. All baselines were staked at 2 m intervals with the use of the transit. Test units of 1 by 1 m were selected within the grid system.

Before selection of the test units, the entire site was examined to determine locations of pothunting activities, potential areas of undisturbed fill, and to obtain a representative sample of cultural features. It was decided to test the kiva and one of the possible rooms surrounding it, the two cobble-walled room blocks, an isolated potential room alignment, and a surface depression that might indicate an earlier pithouse on the site. Because of the unexpected depth of the rooms and the great amount of wall fall in the fill of Room Block 2, Room Block 1 was not tested as planned. Rooms in Room Block 1 appear to be similar in size and depth to Room Block 2. A total of six test pits were excavated on the site. These were dug in 10 or 20 cm arbitrary levels, depending on potential depth of fill, with trowels, shovels, and rock hammers. All material was processed through 1/4 inch mesh screen. Artifacts were bagged separately by type and by level in each grid provenience. Profiles were drawn of stratigraphic levels where present. Each test unit was also photographed upon completion of the excavation.

Eleven radiocarbon samples were retrieved from the testing program. Three of these were submitted for C-14 dating including a large sample of burned corn and fragmentary cobs

recovered in a room (Test Pit 5) within Room Block 2. It was not considered practical or safe to leave these samples in excavated rooms even though they were later backfilled.

Because so many artifacts had been previously picked up by area campers and pine duff covered much that remained, we decided to get a more accurate count of site debris by surface stripping four 4 sq m grids outside of the room block. Three of these were in areas of potential pithouse locations. We also hoped to pick up any variations in artifact or material types over the site.

As work on the test units proceeded, a strategy of systematic auger probing was implemented in areas outside of the room blocks. We were specifically looking for subsurface evidence of surrounding pithouse occupation of the site. A total of 52 auger holes was placed every 2 m along selected baselines.

At the conclusion of the testing program, each test pit was backfilled and leveled. Evidence of site disturbance was thus kept to a minimum. The primary datum was left in place as a reference for future work.

Field notes were kept daily by each archaeologist. Maps were made of each test unit, and all artifacts were catalogued in the field. All materials and notes were taken back to the laboratory where a preliminary analysis of all artifacts was conducted. Ceramics were classified by type and lithics by material and tool type. A detailed analysis will be performed at the end of Phase II as per the original proposal. All original maps, records, and photographs will be deposited with the Archeological Records Management System of the State Historic Preservation Division in Santa Fe. Artifacts are the property of the U.S. Forest Service, who will determine their disposition upon conclusion of analyses.

No evidence of human remains was uncovered during the testing program at East Ridge Pueblo.

Field plans called for examining the two room blocks (Fig. 3), the isolated room, and the kiva area (Fig. 4) with the 1-by-1-m test pits and to strip several of the outlying surface areas for evidence of activity areas. Also, because of the potential for a pithouse settlement on the site, we selectively chose areas to additionally test, strip, or auger, based on the presence of artifact clusters.

Our original intentions were to place two test pits each in the two room blocks and in the kiva, one in an adjoining kiva room, one in the isolated room to the west, and one in the possible pithouse depression. We began with two test pits in Room Block 2 and one in the nearby isolated room in order to keep all working units close to each other for the first series of tests. Because of the greater than expected depth of the two rooms in Room Block 2 and the large amount of rock wallfall, we did not have time to test Room Block 1 but rather chose to continue with the kiva, associated room, and the possible pithouse area. This allowed us to test six areas for cultural features and assess site condition.

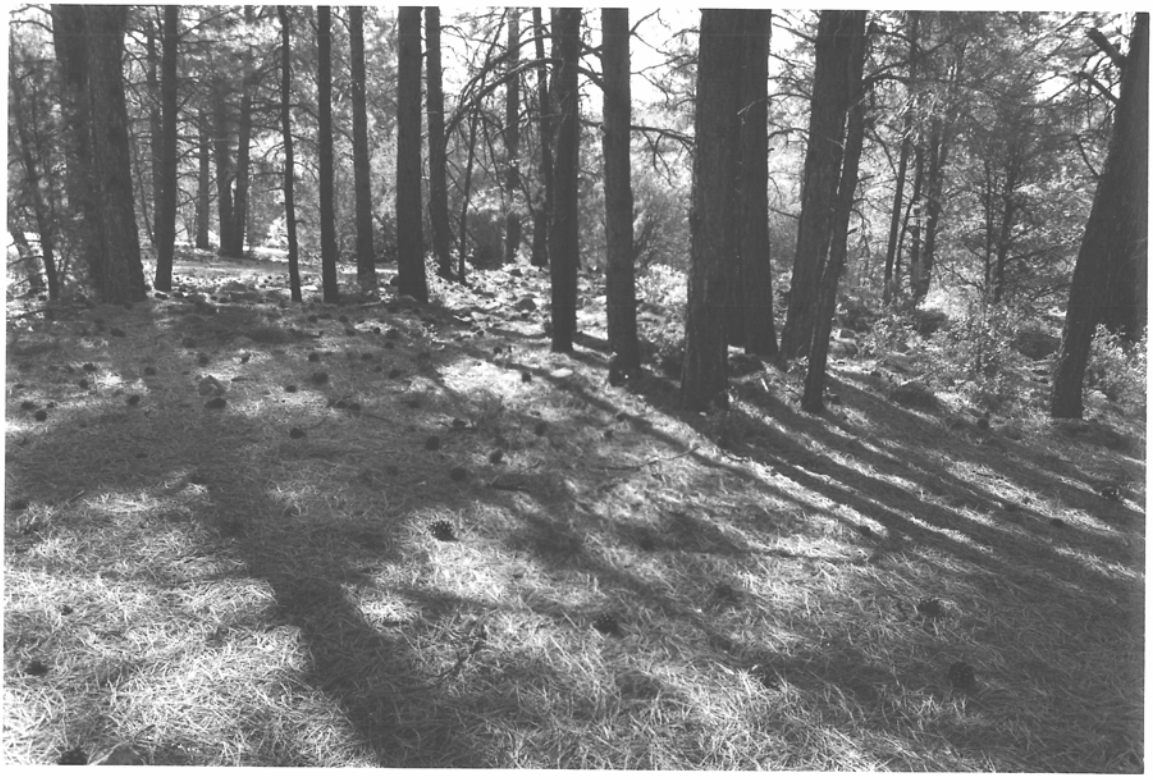

Figure 3. East Ridge Pueblo, mound with cobble rooms, facing northeast.

Figure 4. Kiva depression with berm, facing south.

Testing Results

Results of the testing program are described in detail for each cultural unit: Room Block 1, Room Block 2, kiva, and associated room, isolated surface room, and possible pithouse area. Surface stripping units and auger tests are also described. As noted previously, all test units were dug in 1 by 1 m units while surface stripping was carried out in blocks of four adjoining 1 by 1 m squares.

Room Block 1

We estimate that there may be eight rooms in this room block. The mound is rectangular in shape and measures 21 by 12 m (Fig. 2). Cobble wall outlines are visible on the surface, although extensive pine duff and wind-blown fill cover many of them. There are three visible potholes present within the room block. Because of time limitations that arose after the testing of Room Block 2, this room block was not tested. The similarity in height of the mound and condition to Room Block 2 indicate that Room Block 1 may be considered comparable for assessment.

Room Block 2

Room Block 2 lies 4m southwest of Room Block 1. It is slightly smaller, measuring 18 by 12 m. Cobble walls are also visible with room estimation also at eight. One room has been partially excavated by W. Turney, and standing walls can be seen to a depth of 90 cm below ground surface.

Test Pit 5 consisted of a 1 by 1 m unit placed within an undisturbed interior room of the room block. We attempted to place it next to a potential cobbled wall. From the start, there was a large amount of rock wallfall present in the grid. Also, just beneath the ground surface, a lens of ash extended over the east half of the grid. It measured 22 cm in depth and its profile was visible on the east wall of the test pit. A few prehistoric artifacts were recovered from this lens along with pieces of historical material-wire nails, burned glass fragments, leather pieces, and a pencil nib. It appeared as though this whole area was disturbed. However, on the site surface nearby were the remains of a stove pipe and roofing material. The campground hosts subsequently informed us that a miner had lived on the site many years ago. We apparently found his ash dump.

The remainder of the test pit contained numerous undisturbed artifacts (N = 251), wall fall, and beginning at 60 cm below ground surface, a large amount of burned corn kernels and small cob fragments. These were collected for radiocarbon and botanical analyses. On the charcoal-stained, hardpacked clay floor were large sherds of a Plain Corrugated olla. We suggest that the corn spilled from such a container on the roof of the room block down into the room. This interior room extends to 90 cm below the ground surface.

We did not uncover the room wall in this test grid. We removed much wallfall, but working in a 1 by 1 m space did not allow us to readily distinguish layered wall fall from actual

wall. Therefore, some wallfall was left along the west edge of the grid.

Test Pit 6 was also placed within Room Block 2 in a seperate room from Test Pit 5. Wallfall was also plentiful here, but a standing wall in very good condition was readily found. It is 28 cm wide and made of irregularly shaped basalt cobbles laid up randomly in a mud mortar with many chinking stones to form the wall (Fig. 5). The room contained 247 artifacts, charcoal for C-14 samples, and 8 manos, 5 of which were on the floor. An ash stain also covered a portion of the floor. Root disturbance from the many pine trees growing within the room block have destroyed a small portion of the wall. Otherwise, the room appears to be in very good condition with the wall reaching a depth of 83 cm.

Kiva

A large kiva depression with a wide encircling berm lies 6 m south of Room Block 2. A small portion of the kiva was excavated by Turney but has been filled back in. The kiva depression measures 10 m across and is 1.1 m deep at present.

In Test Pit 7 we attempted to examine an undisturbed portion of the kiva and to locate the wall. The wall was uncovered in the middle of the test pit, and an adjoining grid (Test Pit 8) was therefore opened immediately to the south to facilitate working in this area.

The kiva wall is constructed of generally flat basalt rocks with rhyolite chinking stones reaching a depth of 1.65 m below ground surface (Fig. 6). Plastering is evident below 70 cm depth and continues to the floor. The floor is plastered with clay. A total of 121 artifacts were recovered.

In Test Pit 8, along with the kiva wall, we also encountered a posthole. The post had been set back into the kiva wall and the exposed area plastered over. The posthole measures 40 cm in diameter. Artifacts numbered 31.

Few artifacts (N = 152) were recovered in the kiva; however, we were at the very edge of the structure. Our tests could not determine the shape of the kiva within the test units.

Adjoining Kiva Room

Turney thought that several rooms might adjoin the kiva, particularly on the east and south sides. We concur. Test Pit 9, an area immediately next to the kiva on the southeast, was selected for testing to determine whether rooms were present. The test pit encountered no walls; however, a large number of artifacts (N = 250) extended to 1.05 m below ground surface. Soil was dark and charcoal-flecked and a hard-packed surface was found. A C-14 sample was obtained from charcoal in the lower fill of the grid. Because of the great depth of cultural material (extending well below the surrounding ground surface), we believe there may be rooms surrounding the kiva. We cannot determine their number, but possibly five or six rooms may be present. This would be an unusual feature for kivas in the Mogollon area.

Figure 5. Wall of room in Test Pit 6.

Figure 6. Kiva wall and floor with plastered posthole and wall.

Surface Room

A single rock outline measuring about 5 by 3.5 m can be seen just west of Room Block 2. It appears to be a surface room with much of the cobble outline missing. Test Pit 1 was placed within this cobble outline. We tried to abut the wall to determine construction techniques for the room. Artifacts were recovered from the test pit, which reached a depth of 47 cm before encountering a hardpacked, charcoal-flecked, clay surface. The wall is not cobble-lined, but formed by digging out the natural soil to form sloping side walls. The visible surface outline may be all that remains of above-ground walls to the structure. We saw no floor features or postholes. Because of the large variety and amount of artifacts (N = 611) from this area and a wall outline with subsurface depth, we believe this represents one of those anomalous, single, isolated rooms frequently found adjacent to Late Period sites (Accola 1981). The ceramic assemblage suggests contemporaneity with Room Block 2.

Possible Pithouse

Early ceramics of the Alma series, San Francisco Red, and corrugated wares lie to the east and north of the room blocks over an extensive area, much of it upslope from the room blocks. One depression was observed in the area to the southeast of Room Block 2. Large numbers of surface artifacts are also present as well as darkened soil.

The slight depression, measuring 5 by 4.5 m, was tested for the presence of a pithouse. Test Pit 10 was placed to possibly include any walls that might be present. Many artifacts (N = 626) were recovered from the test grid, which reached a depth of 54 cm below ground surface. The wall edge was not encountered but the fill was dark, loamy, and charcoal-flecked. The bottom of the unit was an uneven surface. We cannot be positive that this is a pit structure, however, we suggest that it may be. The artifacts date to the Late Pueblo occupation of the site, suggesting that, if it was an earlier pithouse, it had been used for trash from the room blocks. The several broken ground stone fragments would also indicate this use.

Surface Stripping

A total of six 4 m sq units were surface stripped of loose soil and pine duff at East Ridge Pueblo. Locations of units were selected on the basis of proximity to the room blocks, density of artifact clustering, and degree upslope from the structures.

Area A lies 20 m east of the kiva area and 4 m south of the possible pit structure depression. Artifacts lay slightly downslope from the depression and probably derive from that area. We recovered 570 artifacts from stripping, including 11 small pieces of fauna, 2 very small stone beads, a ground stone fragment, and a quartz crystal. Ceramics date from the Pithouse Period of the Mogollon through the Late Pueblo occupation of the site. They further suggest that the pit unit may have been a trash dump.

Area B is 6 m northwest of the kiva depression on level ground. In this area, 201 artifacts were obtained. Few diagnostic sherds were recovered; most are brown wares, smudged wares, and corrugated wares. They match, in ceramic types, the plain and corrugated wares of

the nearby room block.

Area C was placed 10 m north of the pithouse area in a heavy artifact scatter with dark soil visible beneath the pine duff. We recovered 511 artifacts. Again, the ceramics are consistent with the Pueblo occupation of the site. Because of the dark soil present, it is possible that more subsurface features may exist in this area.

Area D is 10 m west of Room Block 1 in a level, heavily duffed location. A total of 315 artifacts were retrieved from the surface stripping. Smudged wares and Reserve/Tularosa Black-on-white sherds place the artifact scatter into the Late Pueblo occupation of the room blocks.

Area E is located 40 m upslope from Room Block 1 in an artifact scatter. We wanted to see if the artifacts might indicate an earlier occupation of the ridge. A total of 112 artifacts was recovered. Ceramics consisted solely of Alma Plain and Plain Corrugated with no Late Pueblo sherds. Lithic artifacts also vary from those around the room blocks in material type. This assemblage suggests that an early San Francisco phase pithouse settlement may exist in this area.

Area F was placed another 24 m upslope from Area E, also in search of an earlier pithouse settlement on the site. The ridge peaks at this point, creating a level knoll with a slope south to the room blocks. We recovered 333 artifacts. Sherds consisted of Alma Plain, Plain Corrugated, and San Francisco Red. This, again, is a Pithouse Period assemblage with no later Pueblo intrusives.

Auger Tests

A total of 52 auger tests were conducted on the site after the completion of the testing and surface stripping. These were placed every 2 m along selected grid lines where we wanted to better understand the subsurface nature of the site. The auger holes ranged in depth from 9 to 40 cm below the ground surface. In 29 of these, or 55.7 percent, artifacts were recovered. Sixteen of the auger tests had more than one artifact, in one case, up to eight. Many of the tests could not be taken to their full depth because of the great number of subsurface rocks on the site. The locations of the tests are shown in Figure 2.

The only area that did not produce subsurface artifacts is located at and north of Subdatum A, 30 m northeast of Room Block 1. All other areas revealed the presence of dark, often charcoal-flecked soils containing artifacts.

Artifacts found in the auger tests were placed back in the test hole after being recorded. The holes were then manually filled.

ARTIFACT DESCRIPTIONS

A total of 4,179 artifacts were recovered from the 12-day testing program. In addition, we obtained 11 C-14, 3 flotation, and 3 pollen samples. These will be discussed at the end of this section. The artifact distribution for the site is shown in Table 1 by test or stripping unit. It can be seen that the artifacts are generally heavily distributed over the site with the exception of the test grids (7 and 8) on the edge of the kiva. In contrast to our expectations for the site, while larger sherds are notably absent from the site surface, many artifacts remain beneath the heavy pine duff. A breakdown of the artifacts by type within test units is presented next (Table 2). Because of the large number of artifacts recovered, fine-grained analyses were not performed. In-depth analyses will occur during Phase II if further excavations are warranted by the U.S. Forest Service.

Table 1. Artifact Distribution

Tests	Sherds	Lithics	Ground Stone	Fauna	Beads	Hammerstone	Crystal	Total
1	498	93	4	16				611
5	213	28	4	5		1		251
6	197	33	9	8				247
7	94	25	1	1				121
8	23	8						31
9	138	102	3	7				250
10	433	168	2	27				626
A	341	215	1	11	2		1	570
B	163	38						201
C	378	131	1	1				511
D	233	80	1	1				315
E	56	56						112
F	156	176						333
Totals	2923	1153	26	77	2	1	1	4183
%	69.9	27.6	.6	1.8	-	-	-	99.9

Ceramics provide the bulk of the data set (70 percent). From Table 2, it is obvious that about 80 percent of these are long-lived Alma Plain and Plain Corrugated wares that span the entire brown ware sequence in the Mogollon Highlands. Of more importance for chronometric assignments are the limited numbers of white wares, slipped brown wares, and decorated brown wares. These include Reserve Black-on-white, Tularosa Black-on-white, Mimbres Black-on-

Table 2. Ceramics Recovered from Testing

Tests	1	5	6	7	8	9	10	A	B	C	D	E	F	Total	%
Alma Rough	196	85	61	43	7	82	286	250	101	239	144	53	149	1696	57.6
Plain Corr	144	50	65	15	6	21	63	54	53	90	63	3	4	631	21.5
Ind Corr	51	15	20	1	1	2	7	4	3	8	6			118	4.0
Incised Corr	4	6	3	5		2	2	3	1	3	1			30	1.0
Punct Corr	1	1						1			1			4	.1
Pattern Corr	3													3	.1
Tularosa Patt Corr		3												3	.1
Tularosa Corr		9		6		1	1							17	.5
Tularosa Ind Corr			1											1	-
Alt Corr	2	1												3	.1
Alma Neck	2						1							3	.1
Reserve Corr		3												3	.1
Reserve Smud	65	23	34	15	5	18	35	6	3	39	15			259	8.8
Indet Corr			1											1	-
Plain Corr Sm	1	1	1											3	.1
Inden Corr Smud	2	3												5	.1
Tularosa Corr Smud			1	2										3	.1
Reserve Corr Smud			1											1	-
Stark Smud					3									3	.1
Tula Fill Rim	1	1	1											3	.1
Tula Fill Rim, Smud		1				1								2	-
Three Circle Neck							1							1	-
San Fran. Red	5	2	2	1		1	3	4	2				2	22	.7
Indet Red							1							1	-
Indet White	8	2	2	1		2	11	2	1	1				31	1.0
Reserve B/w	3	2				2	11	13			1			32	1.0
Res/Tula B/w	10	6	4	3		7	4				2			36	1.2

Tests	1	5	6	7	8	9	10	A	B	C	D	E	F	Total	%
Tularosa B/w	1			1	1									3	.1
Three Circle R/w								1						1	-
Mimbres B/w	2						1							3	.1
Indet			1											1	-

white, Tularosa Fillet Rim, Patterned Corrugated, and smudged wares including three pieces of rare Starkweather Smudged. The presence of these sherds in the room block test units indicate an early Tularosa phase (ca. A.D. 1100-1300) date for the site. The corrected and calibrated C-14 date, averaged A.D. 1166, confirms this conclusion. No White Mountain Redwares were observed on the site despite their common presence during the Tularosa phase.

The exclusive presence of Alma Plain, San Francisco Red, and Plain Corrugated wares at the northeast end of the site in Stripped Areas E and F, supports our opinion that an earlier pithouse settlement exists on the site.

Tularosa phase ceramics in the pithouse area (Test Pit 10) east of the room block suggest reuse of a possibly earlier structure. Until this unit is fully excavated, however, we cannot rule out its construction by Pueblo peoples.

Lithic artifacts make up 27.5 percent of the site artifact assemblage. These are divided in Table 3 by generalized artifact type and in Table 4 by material type in order to monitor any differences occurring across the site.

Flakes dominate the assemblage at 59.3 percent. However, at the north end of the site, where pithouses may exist, the ratio of angular debris to flakes is much lower. Microflakes also increase greatly in this area. This may imply more of a reliance on lithic tools or that more on-site manufacturing processing is occurring in this area.

The amount of angular debris within room block test units is in sharp contrast to that found in the surface stripped areas, an angular debris to flake ratio of almost 1:7. Explanation of this pattern is not possible with this limited data set. However, the manufacturing of lithic artifacts simply may not have occurred within rooms, but in outside activity areas. Cores, however, are minimally present on the site.

Formal tools consist solely of projectile points. These are all small, side-notched where determinable, Pueblo period points made of obsidian. All were found within structural features. The reason for this may be that campground visitors likely collected any visible projectile points from the site surface. The three scrapers are made expediently from flakes of obsidian (2) and chert (1).

All raw material used for lithic artifacts can be obtained in the general vicinity of the site. The source of the obsidian flakes will be ascertained when further analyses are performed.

Table 3. Lithic Artifact Types

Tests/Strips	Flakes	Angular Debris	Microflakes	Projectile Points	Scrapers	Cores	Total
1	89	4					93
5	25	1		2			28
6	29	3		1			33
7	20	1	2	1	1		25
8	6	2					8
9	79	20		3			102
10	140	9	15		1	3	168
A	110	66	38		1		215
B	10	18	10				38
C	75	56					131
D	39	35	6				80
E	20	23	13				56
F	42	77	57				176
Totals	684	315	141	7	3	4	1153
%	59.3	27.3	12.2	.6	.2	.3	99.9%

Table 4. Lithic Material Types

Tests/Strips	Rhyolite	Basalt	Obsidian	Quartzite	Chert	Chalcedony	Mudstone	Total
1	66	8	8	1	7	2	1	93
5	11		15		1	1		28
6	19	5	3		5	1		33
7	17	1	6			1		25
8	5	1	2					8
9	77	7	8	1	4	3	2	102
10	112	9	29	3	11	4		168
A	183	7	13	4	3	5		215
B	20	5	9	1	1	1	1	38
C	106	13	2	1	9			131
D	54	3	15		2	3	3	80

Tests/Strips	Rhyolite	Basalt	Obsidian	Quartzite	Chert	Chalcedony	Mudstone	Total
E	30	1	12	4	6	3		56
F	120		29	12	3	11	1	176
Totals	820	60	151	27	52	35	8	1153
%	71.1	5.2	13.1	2.3	4.5	3.0	.7	99.9

Rhyolite is, by far, the material of choice of all site residents. It outcrops locally and can be of fine quality. Obsidian is the choice material for projectile points and two of the three scrapers.

Few lithic artifacts were recovered from the kiva area and, in general, from all of the rooms within the room block except the associated kiva room. If rooms were used for habitation or storage, then we would expect this to be a valid pattern. However, this does not explain Test Pit 9 (associated kiva room) with 102 lithic artifacts. More complete excavation of these features would be necessary to answer many of these questions.

The high lithic artifact count in Test Pit 10 is expected if this feature is a pit structure that was later used as a trash dump.

The ground stone assemblage is small but informative (Table 5). Manos or metates were found in all rooms except the kiva. Test Pit 6 in Room Block 2 contains over 1/3 of all ground stone recovered. Five manos were sitting directly on the floor. Milling activities probably occurred here. Metates recovered are the trough type with one of the basin variety.

Table 5. Ground Stone Frequencies

Tests/Strips	Manos	Metates	Polished Stone	Indct	Total
1	3	1			4
5	3	1			4
6	8	1			9
7			1		1
8					1
9	1			2	3
10	1	1			2
A				1	1
B					
C				1	1
D				1	1

Tests/Strips	Manos	Metates	Polished Stone	Indet	Total
E					
F					
Totals	16	4	1	5	26
%	61.5	15.4	3.8	19.2	100

Faunal remains (N=77) were not analyzed as to species. Their distribution can be seen in Table 1. The bones recovered from the surface stripped areas were very small fragments, as were most pieces from the room block. Several deer and rabbit fragments were identified during excavation. A single bone fragment was recovered from the kiva.

Two black beads and a crystal were the only ornamental goods found on the site. The two beads were recovered from Area A and are likely from the same necklace strand. They are complete, made of a jetlike material, and are 3.2 mm in diameter. The crystal is quartz and very small (2.5 cm in length).

Three of the 11 C-14 samples have been submitted for analysis in order to obtain dates for the site. The remainder will be available when further work is undertaken. The three corrected dates are: A.D. 960 $\pm$ 60, A.D. 1080 $\pm$ 70, and A.D. 1170 $\pm$ 70. These have been averaged to within a 1.38 sigma range at A.D. 1166. The flotation and pollen samples will also be analyzed when Phase II is completed.

SITE ASSESSMENT

East Ridge Pueblo is an early Tularosa phase site with two room blocks, a kiva and associated rooms, an isolated surface room, and an earlier pithouse occupation. Corrected and calibrated dates, averaged to A.D. 1166 place the use of the pueblo between A.D. 1038 and 1221 at the two sigma range. Its location on a ridge directly above a [redacted] in the Apache National Forest makes it an ideal choice for an interpretive site. Its proximity to the campground has also made it a target for artifact collectors and illegal digging.

While there are seven visible potholes and prior excavation in one room and part of the kiva, the site is in very good to excellent condition. Artifact frequency throughout the site is much higher than expected and, when found below the surface, are well preserved. Faunal remains seem to be adequately represented and botanical and palynological data potential are plentiful. Walls in the room blocks stand 90 cm high and room contents, away from the potholes, are undisturbed. The kiva has very good integrity including plastered walls, a plastered floor, and postholes. The isolated surface room has little remaining architecture, but the room contents are intact and artifacts are abundant. One or more pithouses are probably present on the site. Their condition is undisturbed as their location has not yet been identified.

The pueblo has excellent data potential and limited excavation would be a good complement to the interpretive program established at the campground by the U.S. Forest Service. We recommend that the kiva be partially or completely excavated as well as one of the features associated with it, as encountered in Test Pit 9. A single room in each of the room blocks would be sufficient for initial investigations. However, the partially exposed room opened by Turney should be completely cleaned up. At present, it looks like a pothunter's exploration. The isolated room (Test Pit 1) could also be further examined to examine its role in the structure of the site if monies are available.

East Ridge Pueblo has the potential to provide significant data on the Early Tularosa phase in the Mogollon Highlands. The Office of Archaeological Studies, Museum of New Mexico, has partially excavated three sites of this period along highways U.S. 180 and NM 12. We have identified many research problems that could be addressed through the controlled excavation of the pueblo. For example, how dependent on domesticated cultigens was the population of this time period? What types of agricultural techniques did they employ? What role did faunal resources play in subsistence adaptations? What is the balance between faunal and floral resources? Is there any evidence for constraints on mobility, such as storage facilities? Is there any growing evidence for an environmental or social imbalance that would eventually cause these peoples to abandon the area?

If the U.S. Forest Service concurs with our recommendations that further archaeological investigations are warranted at East Ridge Pueblo, the OAS will submit a data recovery plan and a proposed budget.

REFERENCES CITED

Accola, Richard M.
1981 Mogollon Settlement Patterns in the Middle San Francisco River Drainage, West-Central New Mexico. *The Kiva* 46(3):155-168.

Beckett, Patrick
1973 *Cochise Culture Sites in South Central and North Central New Mexico.* M.A. thesis, Eastern New Mexico University, Portales.

Berman, Mary Jane
1979 *Cultural Resources Overview of Socorro, New Mexico.* USDA Forest Service and Bureau of Land Management, Albuquerque and Santa Fe.

Berry, Michael S.
1982 *Time, Space and Transition in Anasazi Prehistory.* University of Utah Press, Salt Lake City.

Bluhm, E.
1957 The Sawmill Site, a Reserve Phase Village. *Fieldiana: Anthropology Series* 47(1). Chicago.

Bullard, William R.
1962 *The Cerro Colorado Site and Pithouse Architecture in the Southwestern United States prior to A.D. 500.* Papers of the Peabody Museum of American Archaeology and Ethnology 44(2). Harvard University, Cambridge.

Bussey, Stanley, and Patrick Beckett
1974 *A Final Report on the Archaeological Survey of a Portion of the Southwest Arm of the National Raidio Astronomy Observatory VLA Project.* Cultural Resources Management Report. Las Cruces.

Davis, E. L.
1963 The Desert Culture of the Western Great Basin: A Lifeway of Seasonal Transhumance. *American Antiquity* 29(2):202-212.

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

Eck, David C.
1982 *Fence Lake Coal Exploration: An Archaeological Survey on the Hubbell Ranch near Quemado, New Mexico, for the Salt River Project.* Office of Contract Archeology, University of New Mexico, Albuquerque.

Gabin, Vickie L., and Lee E. Lesperance
1977 *New Mexico Climatological Data: Temperature, Evaporation, and Wind, Monthly and Annual Means.* W. K. Summers and Assoc., Socorro.

Haury, Emil W.
1936 *Mogollon Culture of Southwestern New Mexico.* Medallion Papers 20. Gila Pueblo, Globe, Arizona.

Heller, M. M.
1976 *Zoo-archaeology of Tularosa Cave, Catron County, New Mexico.* M.A. thesis, University of Texas, El Paso, El Paso.

Hogan, Patrick
1985 *Prehistoric Settlement Patterns in West-Central New Mexico: The Fence Lake Coal Lease Surveys.* Office of Contract Archeology, University of New Mexico, Albuquerque.

Honea, Kenneth
1969 The Rio Grande Complex and the Northern Plains. *Plains Anthropologist* 14(43):57-70.

Honea, Kenneth, and B. Benham
1963 *Highway Culture Inventory.* Archaeological Records Management System, Historic Preservation Bureau, Santa Fe.

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

Hunter-Anderson, Rosalind L.
1986 *Prehistoric Adaptation in the American Southwest.* Cambridge University Press, Cambridge.

Hurt, William R., and D. McKnight
1949 Archaeology of the San Agustin Plains: A Preliminary Report. *American Antiquity* 14(3):172-193.

Irwin-Williams, Cynthia
1973 *The Oshara Tradition: Origins of Anasazi Culture.* Contributions in Anthropology 5(1). Eastern New Mexico University, Portales.

1979 Post Pleistocene Archaeology, 7000-2000 B.C. In *Handbook of North American Indians*, vol. 9, *Southwest*, edited by Alfonso Ortiz, pp. 31-42. Smithsonian Institution Press, Washington, D.C.

Kayser, David W.
1988 Cultural-Historical Setting. In *Archaeological Investigations in West-Central New Mexico*, vol. 3, *Report of the Final Field Season*, edited by D. W. Kayser and C. H. Carroll. BLM, Santa Fe.

LeBlanc, Steven A.
1976 Mimbres Archaeological Center: Preliminary Report of the Second Field Season, 1975. *Journal of New World Archaeology* 2(2):1-24.

Lightfoot, Kent G., and Roberta Jewett
1986 The Shift to Sedentary Life: A Consideration of the Occupation Duration of Early Mogollon Villages. In *Mogollon Variability*, edited by Charlotte Benson and Steadman Upham, pp. 9-43. Occasional Papers 15. New Mexico State University, Las Cruces.

Maker, H. J., R. E. Neher, and J. U. Anderson
1972 *Soil Associations and Land Classification for Irrigation, Catron County*. Agricultural Experiment Station Research Report 229. Las Cruces.

Martin, Paul S.
1943 *The SU Site, Excavations at a Mogollon Village, Pine Lawn Valley, Western New Mexico, Second Season, 1941*. Fieldiana: Anthropology Series 32(2). Field Museum of Natural History, Chicago.

Martin, Paul S., and John R. Rinaldo
1947 *The SU Site, Excavations at a Mogollon Village, Western New Mexico: Third Season, 1946*. Fieldiana: Anthropological Series 32(3). Field Museum of Natural History, Chicago.

1950 *Turkey Foot Ridge Site, a Mogollon Village, Pine Lawn Valley, Western New Mexico*. Fieldiana: Anthropology Series 38(2). Field Museum of Natural History, Chicago.

Martin, Paul S., John B. Rinaldo, and Ernst Antevs
1949 *Cochise and Mogollon Sites, Pine Lawn Valley, Western New Mexico*. Fieldiana: Anthropology Series 38(1). Field Museum of Natural History, Chicago.

1950 *Cochise and Mogollon Sites, Pine Lawn Valley, Western New Mexico*. Fieldiana: Anthropology Series 39(1). Field Museum of Natural History, Chicago.

Martin, Paul S., John B. Rinaldo, and E. R. Bluhm
1954 *Caves of the Reserve Area*. Fieldiana: Anthropology Series 42. Field Museum of Natural History, Chicago.

Martin, Paul S., John B. Rinaldo, E. Bluhm, H. C. Cutler, and R. Grange, Jr.
1952 *Mogollon Cultural Continuity and Change: The Stratigraphic Analyses of Tularosa and Cordova Caves*. Fieldiana: Anthropology Series 40. Field Museum of Natural History, Chicago.

Minnis, Paul E.
1981 *Economic and Organizational Responses to Food Stress by Non-Stratified Societies: An Example from Prehistoric New Mexico*. Ph.D. dissertation, University of Michigan, Ann Arbor.

1985 *Social Adaptation to Food Stress: A Prehistoric Southwestern Example.* University of Chicago Press, Chicago.

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

Nesbitt, Paul H.
1938 *Starkweather Ruin.* Logan Museum Publications in Anthropology, Bulletin 6. Beloit College, Beloit, Wisconsin.

Nightengale, Chris
1980 Site survey files. Archeological Records Management System, Historic Preservation Bureau, Santa Fe.

Peckham, Stewart
1957 The Switchback Site: A Stratified Ruin near Reserve, New Mexico. In *Highway Salvage Archaeology* 3(11):10-38, edited by Stewart Peckham. New Mexico State Highway Department and Museum of New Mexico, Santa Fe.

1958 Hillside Pueblo: Early Masonry Architecture in the Reserve Area, New Mexico. *El Palacio* 65(3):81-94.

1963 The Luna Junction Site: An Early Pithouse in the Pine Lawn Valley, New Mexico. *Highway Salvage Archaeology* 4(17):41-55, edited by Fred Wendorf. New Mexico State Highway Department and Museum of New Mexico, Santa Fe.

Quimby, George I.
1949 Excavations. In *Cochise and Mogollon Sites, Pine Lawn Valley, Western New Mexico,* edited by Paul S. Martin, John B. Rinaldo, and Ernst Antevs, pp. 26-33. Fieldiana: Anthropology Series (38). Field Museum of Natural History, Chicago.

Rice, Glenn E.
1975 *A Systematic Explanation of a Change in Mogollon Settlement Patterns.* Ph.D. dissertation, University of Washington, Seattle.

Rinaldo, John B.
n.d. Notes on Minor Excavations in the Reserve Area, West Central New Mexico. Manuscript on file, Field Museum of Natural History, Chicago.

Sayles, E. B.
1983 *The Cochise Cultural Sequence in Southeastern Arizona.* University of Arizona Press, Tucson.

Sayles, E. B., and Ernst Antevs
1941 *The Cochise Culture.* Medallion Papers 29. Gila Pueblo, Globe, Arizona.

Wendorf, Fred, E. N. Ferdon Jr., and J. Bradbury
1963 A Tularosa Phase Pueblo near Luna, New Mexico. In *Highway Salvage Archaeology* 4(16):29-40, edited by Fred Wendorf. New Mexico State Highway and the Museum of New Mexico, Santa Fe.

Wills, W. H.
1988a *Early Prehistoric Agriculture in the American Southwest*. Cambridge University Press, Cambridge.