MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

Prehistory of the Berrendo River System in the Southern Plains of New Mexico

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ARCHAEOLOGY NOTES 236

SANTA FE 2004 NEW MEXICO

ADMINISTRATIVE SUMMARY

In 1993 the New Mexico Department of Transportation (DOT) requested that the Office of Archaeological Studies (OAS), Museum of New Mexico, undertake data recovery operations at five cultural resource sites along the northwest sector of the Roswell Relief Route. The work, performed according to the approved data recovery plan (Wiseman 1992), was part of DOT project ST-(F)-023-2(202). All five sites were on DOT right-of-way and lands to be acquired from private sources. Data recovery was conducted in the fall and winter of 1993/1994.

This report constitutes the final report for the four prehistoric sites. The final report for the historic site (LA 54346—the Cass homestead) is being prepared by Mr. Jeffrey Boyer of the OAS and will be submitted separately.

LA 68182—Los Molinos—was extraordinary for its cultural richness and preservation. It consisted of 88 bedrock grinding features, a natural crevice filled with prehistoric refuse, and thousands of artifacts, animal bone, floral remains, human remains, and rich organic soil. The occupation(s) date primarily to the late prehistoric (pottery) period, but Late Archaic remains may also be represented.

LA 68183—The Camp—was a small hearth and artifact scatter near LA 68182. The people from this site may have used the bedrock grinding features at LA 68182. The occupation(s) probably date to the late prehistoric (pottery) period.

LA 54347—White Paint—was a large hearth and artifact scatter site situated on the north terrace of the South Berrendo River. Because most of this site lay within the highway project, an intensive and extensive surface inventory and mapping of burned rocks and surface artifacts was conducted. Excavations were limited to several trowel tests in suspected hearths and the exposure of one large burned-rock hearth. The occupations date to the Late and terminal Archaic periods and possibly to the late prehistoric period.

LA 68185—Sitio Largo—was a large hearth and artifact scatter site situated on the south terrace of the South Berrendo River opposite LA 54347. Only the west end of the site lay within the highway project. A hearth within the project area was scheduled for excavation but, before field work commenced, a major flood covered that part of the site with a layer of silt, preventing relocation and excavation of the hearth. The occupations date to the Middle, Late, and terminal Archaic periods and to the historic period. Late prehistoric (pottery) period use of the site evidently did not occur.

MNM Project 41.439a (Roswell NW)
DOT Project ST-(F)-023-2(202), CN 1100
State of New Mexico (CPRC) Archaeological Excavation Permit SE-93

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ACKNOWLEDGMENTS

I thank the following individuals and organizations for their assistance in bringing this project to a conclusion:

- Field crew—Byron Hamilton, Bob Sparks, Pat Severts, Dave Hayden, Lloyd Moiola, and Jeff Cox.
- John Montgomery, Joanne Dickenson, Jim Dickenson, and John Shuster of the Agency for Conservation Archaeology, Eastern New Mexico University, for site mapping.
- Nancy Akins and Susan Moga, faunal report.
- Mollie Toll and Pam McBride, floral report
- Cameron Cunningham and Karen Adkins, OAS fiscal managers.
- Delinda Andermann, office administration.
- Pete Brown, technical editing.
- Anne Noble, illustration/drafting.
- John Zachman, lithic data entry.
- Eric Blinman, computer programming and applications to lithic data.
- Clifton M. Gibbs, United Drilling, Inc., geologic consultation.
- Beta-Analytic, radiocarbon dating.
- Joe Stewart for supplying a copy of the 1993 radiocarbon calibration program.

—RNW

CHAPTER 1

Introduction

In 1993 the DOT requested that the OAS recover data from prehistoric sites LA 68182, LA 68183, LA 68185, and LA 54347, and from historic site LA 54346. The sites lay in the construction zone for DOT Project ST-(F)-023-2(202), the north sector of the Roswell Relief Route (Fig. 1). The work was accomplished according to the approved data recovery plan (Wiseman 1992).

The data recovery phase began on October 14 and ended on December 28, 1993. From January 31 through February 4, 1994, a final few days were spent finishing up details. This project took longer than anticipated because a refuse-filled crevice was discovered shortly after the field phase began.

The excavations were accomplished by two crews—one for the prehistoric sites, and one for the historic site. The author was responsible for the four prehistoric sites, and Jeffrey Boyer of the OAS excavated LA 54346 (the Cass homestead). This report presents the results for the prehistoric sites. Boyer's report on LA 54346 will be published separately.

Most of this report was written in 1999. Since then, several important projects in the region have been reported (Wiseman 2002 and Speth 2004, for instance), or will be reported before this report is published. Analyses, discussions, and conclusions presented here do not take into account all of these newer findings.

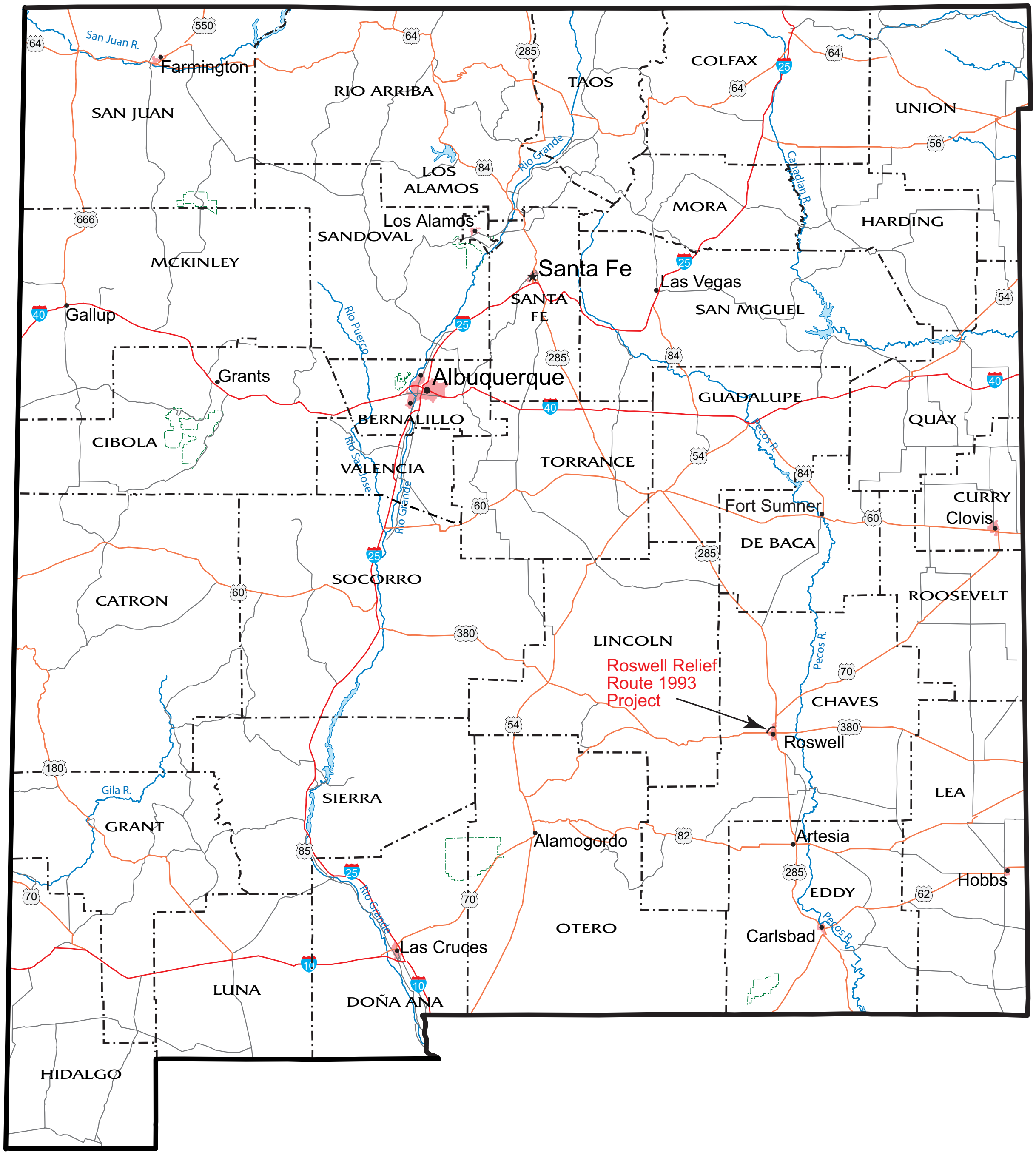

Figure 1. Project location map.

CHAPTER 2

Natural Environment

In some ways the physical appearance of the Roswell area, excluding the city and farms, has not changed much over the past 100 years, especially to the casual eye. It was, and still is, a plains-like environment with broad expanses of grass and scrubland, and trees that are limited to water courses.

But to the naturalist and the ecologist, the changes have been profound. At an early Jornada Conference held in Portales many years ago, the author read a description of the Roswell area based on eyewitness accounts of Euroamerican pioneers in the late 1800s. That description is worth repeating here.

> … in the early days the soil was covered with grama grass. … There was not an indigenous tree anywhere to be seen, except along the banks of the Hondo, which were dotted with ash and hackberries, with occasional specimens of boxwood, elm, and walnut. These trees were nature's arbor for thousands of wild grapevines. … Antelope were more plentiful than cattle and there were thousands of quail and rabbits with ducks, geese, and sandhill cranes in season. … Six rivers within four miles … literally alive, all of them with fish. Catfish, sunfish, bull pouts, suckers, eels, and in the two Spring Rivers and the two Berrendo … splendid bass. The four rivers are so pellucid that you can discern the smallest object at their greatest depth. … The North Spring River … is as transparent as crystal and about forty feet wide. … The Hondo is opaque and the Pecos, … fully as large as the Rio Grande, … is so red with mud that any object is obscured as soon as it strikes the water. Here is where the immense catfish are caught. … Eels five and six feet long are common. Bass in the clear streams from two to four pounds is an average. … The appetite of bass and perch so voracious that the unhooking of them from lines ceased to be a sport. (Shinkle 1966:16, 14, 115, 118)

The biotic wealth of the land at that time was remarkable. It is probably accurate to say that, because the "modern regional environmental boundaries had come to approximate their modern extent" by 2000 B.C. (Wills 1988:57), the biotic aspects in the above description probably also existed during the thirteenth and fourteenth century occupations of the Fox Place. Specifics of the Roswell environment, documented between the 1880s and the present, are summarized below.

The project sites are situated along the Middle Berrendo and South Berrendo Creeks, two formerly spring-fed, perennial western tributaries of the Pecos River. The sites sit on low terraces and hills that border their respective streams. Elevations range from 3,600 ft (1,097 m) to 3,650 ft (1,113 m) above mean sea level. The Pecos River lies 13 kilometers (8 miles) east of the site.

The surface geology of the site area consists of mixed alluvial sediments deposited by the Rio Hondo. San Andres limestone (Permian) outcrops in low hills 2 km to the west (Dane and Bachman 1965). San Andres chert, found eroding from the San Andres limestone, was used for artifacts by the prehistoric inhabitants of the region (Phillips et al. 1981).

The arable soils in the vicinity of the project sites, especially LA 68182, are classified as Balmorhea drained loam. These deep soils consist of dark gray and gray loam, and silty loam to very dark gray silty clay loam, all overlying gray silty clay (Hodson et al. 1980). In addition, these soils are slightly calcareous, neutral through strongly alkaline, and moderately saline. These deep soils are good for growing crops, especially irrigated crops.

Today, farming without irrigation would be successful mostly, perhaps solely, next to streams, where the water table would be shallowest. The normal annual precipitation (11-12 inches) at Roswell is generally insufficient for dryland farming. However, a study shows that average annual precipitation in excess of 16 and even 20 inches per year, and lasting for periods of one or more decades has occurred as recently as the late nineteenth century (Wiseman 2001a).

As related in the lengthy quote at the beginning of this section, surface water in the Roswell area was especially plentiful before A.D. 1900. Several spring-fed streams (North, Middle, and South Berrendo Rivers/Creeks, and the North and South Spring Rivers/Creeks) of local artesian origin held water the year round. The prehistoric peoples also had the waters and resources provided by the Rio Hondo, which has its source in the Sierra Blanca to the west, and by the Pecos River, which has its source in the Sangre de Cristo range in north-central New Mexico. Although only intermittent streams today, the Berrendos, Spring Rivers, and Hondo evidently flowed year round before Euroamerican settlement in the late 1800s (Shinkle 1966; Klasner 1972). The ready availability of water from so many sources gave the Roswell area an oasis-like character.

According to the pioneer accounts quoted above, the vegetation of the Roswell area at the time of Euroamerican settlement consisted of a grama-dominated grassland with trees common only along certain watercourses such as the Rio Hondo. In contrast, Kuchler (1964) posits that the potential natural vegetation was the creosote bush–tarbush association, consisting of "fairly dense to very open vegetation of shrubs, dwarf shrubs and grass." Dick-Peddie (1993) includes the site area within his Desert Grassland.

One of the natural attractions of the Roswell area was the variety and abundance of wildlife. Although not as abundant today as in the recent past, antelope, cottontails, jackrabbits, and other species used by prehistoric peoples are still fairly common. Until the late 1800s, the Pecos River formed the western boundary of the range of the southern Great Plains bison herd, though small herds and individuals frequently crossed the river. The Pecos River, with its Bitter Lakes Wildlife Refuge at Roswell, is a flyway for ducks, geese, and many other migratory species.

Roswell's climate today is characterized by mild winters and hot summers. The normal mean January temperature is 3.3 degrees C (37.9 degrees F); the mean July temperature is 25.9 degrees C (78.6 degrees F); and the yearly mean temperature is 14.7 degrees C (58.5 degrees F) (Gabin and Lesperance 1977). The average frost-free season exceeds 200 days (Tuan et al. 1973).

Precipitation is currently summer-dominant. The mean normalized annual amount is 295 mm (11.6 inches), 210 mm (8.3 inches) of which falls during April through September, and 85 mm (3.3 inches) of which falls during October through March (U.S. Department of Commerce 1965).

CHAPTER 3

Cultural Setting

The prehistoric occupation of the Roswell locality is poorly known for three major reasons. First, few projects other than small contract surveys have been done. Second, the area is peripheral to two major culture areas: the Plains to the east, and the Southwest to the west; attempts at relating Roswell area archaeological remains to one or the other yield ambiguous results. Third, artifact collecting has been a popular activity for Roswell residents over the past 75 years. The loss of information from this activity can not be accurately gauged, but it is clearly very serious if local collections and folklore are any indication. Thus, the brief culture history that follows is based on work from surrounding regions, and its applicability to the Roswell area must be viewed as tentative.

The following outline of the culture history of southeastern New Mexico is distilled from a number of sources. Sources for the prehistoric period include Stuart and Gauthier (1981), a general study of New Mexico archaeology; Sebastian and Larralde (1989), an overview of east-central and southeastern New Mexico; Kelley (1984), a more specific study of the Sierra Blanca region west of Roswell; Jelinek (1967), the Pecos River north of Roswell; Katz and Katz (1985a), the Pecos River south of Roswell); and Leslie (1979), the region east of the Pecos River and especially the southeastern corner of New Mexico. The primary references used for the historic period are Katz and Katz (1985b) and Shinkle (1966). The reader desiring more information is referred to those volumes.

Human occupation of southeastern New Mexico began with the Llano complex ("Clovis Man") of the Paleoindian period, which dates to at least 13,000 years ago. These people and their successors of the Folsom period hunted large mammals (so-called megafauna, such as mammoths and extinct forms of bison) and maintained a nomadic or seminomadic lifestyle. Although most accounts of Paleoindians refer to them as big-game hunters, it is a virtual certainty that they collected and consumed wild vegetal foods and small animals as well as large animals. Paleoindian occupation and use of the project area is demonstrated by Clovis, Folsom, and Eden projectile point fragments found during the Haystack Mountain Survey (Bond 1979), a tract survey conducted 35 km northeast of Roswell.

The retreat of the Pleistocene glaciers and resultant warming of the more southerly latitudes resulted in a shift in human adaptation to the Archaic period. This adaptation was more eclectic and focused on smaller animals such as deer and rabbits. The appearance of grinding tools and specialized burned-rock features suggests a greater reliance on plant foods. The Archaic lifeway was also one of hunting and gathering, and the economy focused on small game and wild plant foods.

The Archaic of the greater Roswell region has not been studied systematically. Archaeologists, looking at the remains from single-site excavations or limited surveys, have posited affiliations with the central Texas Archaic (Bond 1979), the Texas Panhandle Archaic (Jelinek 1967), the Oshara Tradition of northwestern New Mexico (Jelinek 1967), and the Chihuahua Tradition and Cochise Culture of south-central and southwestern New Mexico and adjacent Arizona (Wiseman 1996a).

The prehistoric pottery period in southeastern New Mexico, or that time after about A.D. 200-500, has not yet been investigated as a coherent or singular whole, largely because the region is so vast. The discussion below divides the Pecos Valley region into three areas: Fort Sumner, Roswell, and Carlsbad. Of these, the Roswell and Carlsbad areas pertain directly to the areas north and south of the current project. The Fort Sumner data, especially those pertaining to the Crosby and Roswell phases, are included here because the remains extend down to Roswell and provide perspective for the discussions to follow. Crosby and Roswell phase peoples may be more directly relevant to the question of local indigenous inhabitants versus colonizers from the Sierra Blanca and Trans-Pecos peoples from the Carlsbad area.

Fort Sumner Area

Jelinek (1967) defined a late prehistoric (i.e., pottery period) sequence along the Pecos River below Fort Sumner. Architecture is present in most phases, but the structures and the pottery seem to reflect cultural events in central New Mexico. These small villages of pithouses, and, later on, small pueblos of cimiento construction, were abandoned about A.D. 1250 or 1300 when, as Jelinek (1967) suggests, the people abandoned farming for full-time bison hunting.

Although Jelinek focused his attention on sites 50 km north of the project area, surveys closer to Roswell led him to postulate two separate but related phases for the Roswell area: the Crosby phase and the Roswell phase. Jelinek (1967) does not present singular, coherent descriptions for the Crosby and Roswell phases, rather he discusses them in a sketchy, comparative manner with the equivalent phases in his Fort Sumner sequence. The descriptions given here are gleaned from various statements scattered throughout his report.

The Crosby phase is equivalent to the early and late Mesita Negra phases in the north and dates to ca. A.D. 1000 to 1200. The type site for the phase, P9, is located a few kilometers east of the project sites (Jelinek 1967). It is characterized as a "concentration of several hundred flakes and/or sherds and occasional indications of permanent architecture," but elsewhere Jelinek states that the sites "appear to represent temporary camps." It differs from Mesita Negra phase sites in that the pottery assemblage is dominated by Roswell Brown rather than the Middle Pecos Micaceous Brown of Mesita Negra phase sites. The lithic assemblage is like that of Mesita Negra phase sites. The two identifiable projectile points are wide corner- and side-notched arrow (possibly) points with convex blades and basal edges. The reader is left wondering about the validity of the Crosby phase, for Jelinek (1967:67) states that it is "distinct" but then questions it on ceramic grounds.

The Roswell phase is equivalent to the early and late McKenzie phases in the north and dates to ca. A.D. 1200 to 1300 (Jelinek 1967). The two sites listed for this phase, P7 and P8, are characterized as "concentrations of several thousand flakes and/or sherds with little or no indication of permanent architecture." We are left to presume that "permanent architecture" refers to pithouses or pueblos, such as those excavated closer to Fort Sumner. Roswell phase sites differ from Mesita Negra phase sites in that the pottery assemblage is dominated by Roswell Brown, Jornada Brown, and Chupadero Black-on-white rather than the McKenzie Brown and Middle Pecos Black-on-white of McKenzie phase sites. The lithic assemblage, including numbers of small end-scrapers, is like that of Mesita Negra phase sites. The three identifiable projectile points are wide side-notched arrow points with convex blade edges, and straight to convex basal edges, and a triangular, multiside-notched form.

Roswell Locality

Late prehistoric (pottery period) sites in the immediate vicinity of Roswell appear to reflect the oasis-like character of the area. That is, local natural resources are especially favorable to more intensive occupation and presumably greater population stability than in surrounding areas. It is not surprising, then, that a number of sites known or suspected of having architecture are present, and that they have the character (substantial trash deposits, much pottery, pithouses, pueblo-style dwellings, corn horticulture) of the more sedentary Jornada-Mogollon peoples to the west. For this reason, Kelley (1984) has tentatively included the Roswell locality within the geographic reach of her Lincoln phase, which dates to the late thirteenth, fourteenth, and perhaps early fifteenth centuries. Somewhat earlier remains (e.g., Rocky Arroyo—LA 25277 [Wiseman 1985]) also generally fit the Jornada-Mogollon configuration and can tentatively be included with them.

Other pottery period sites with structures, however, such as King Ranch (Wiseman 1981) and the Fox Place (Wiseman 2002), are enigmatic and currently unassignable to an existing culture chronology. These last two sites are of special interest with regard to the question, posed later on, of the relationship between the prehistoric horticulturists and hunter-gatherers of the region.

These late prehistoric remains in the vicinity of Roswell contrast with the extensive scatters of artifacts that are commonly found in the sand dune country east of the Pecos River (such as the Bob Crosby Draw site—LA 75163) and on the Sacramento Plain north, west, and south of Roswell (Stuart and Gauthier 1981). It is currently unclear how these scatters relate to either Jornada-Mogollon or Plains manifestations. Given the geographic location of the sites, they could have been occupied by peoples from either culture area. How do we make a determination? Some progress is being made in this direction (Speth 1983; Rocek and Speth 1986), but we are far from the last word on the matter.

The Roswell locality evidently was abandoned by farmers in the A.D. 1300s or early 1400s. But because of its abundant water and faunal resources, the area had to figure prominently in all subsequent hunting and gathering patterns of the region between then and the coming of the Spaniards in the late 1500s and 1600s.

Carlsbad Area

In the Carlsbad area an Archaic sequence, including hunter-gatherers dating to the pottery period (Katz and Katz 1985a), evidently relates to the Trans-Pecos culture area immediately to the south in Texas. The sequence starts with the Middle Archaic, rather than the Early Archaic, suggesting that there may have been an occupational hiatus between the Paleoindian and the Avalon phase (3000-1000 B.C.). Little is known about the peoples of the Avalon phase other than the fact that they inhabited the floodplain near the river channel during at least part of the year, camped and constructed hearths in the open, and consumed one or more species of freshwater shellfish. The subsistence orientation at these sites was clearly riverine. Projectile points are currently unknown for this phase.

Late Archaic peoples of the succeeding McMillan phase (1000 B.C. to A.D. 1) are better known in that more sites with a wider variety of remains have been documented. Sites may contain burned-rock scatters, hearths (1-m-diameter clusters of small rocks), and/or burned-rock rings averaging 10 to 12 m in diameter. Previously named projectile point styles associated with the McMillan include the Darl and the Palmillas types of the Texas sequence. Subsistence involved exploiting both riverine and upland plant and animal species.

The terminal Archaic Brantley phase (A.D. 1 to 750) saw a continuation of the previous patterns and a greater use of burned-rock rings. Although this suggests that certain upland resources such as agave and sotol were becoming more important in the diet, the ratio of riverine to upland sites remained the same, with the emphasis still on floodplain living. Projectile point types commonly associated with the Brantley phase include the previously known San Pedro style; a newly described provisional type, the Pecos point; and several less standardized, but nevertheless familiar, styles of points commonly found in the region.

During the Globe phase (A.D. 750 to 1150), the first phase denoted by pottery, occupation of the floodplain environment reached its zenith. Three major changes also occurred in the material culture at this time: the appearance of brown ware pottery, the bow and arrow, and a type of circular habitation structure called a "stone enclosure." In addition, the subsistence system changed from a riverine base supplemented by upland foods, to one that emphasized upland products supplemented by riverine foods. Projectile point styles are dominated by the corner-notched arrow tips called Scallorn. In many ways, the Globe phase appears to have been transitional between earlier and later adaptive patterns.

During the succeeding Oriental phase (A.D. 1150 to 1450), occupation along the river in the Carlsbad area started to diminish. The people who remained in the area continued in some cases to inhabit stone enclosures, and used painted pottery such as Chupadero Black-on-white, Three Rivers Red-on-terracotta, and El Paso Polychrome imported from areas to the west and northwest. Otherwise, they retained their essentially Archaic, hunter-gatherer lifestyle. Why the local culture of Carlsbad/Guadalupe Mountains region did not continue to develop along the same lines as cultures to the north and west remains to be determined.

The Phenix phase (A.D. 1450 to 1540) and the Seven Rivers phase (A.D. post-1540) are predicated on projectile point styles only (Garza-like and Toyah-like in the former, and metal points in the latter), and Katz and Katz (1985a) admit that distinguishing between the two may be dubious in practice. They were able to assign only one site to each phase, indicating that Native American use of the riverine habitat in the Carlsbad area was minimal, mostly oriented towards hunting and perhaps succulent plant exploitation, and perhaps focused mainly on Rocky Arroyo.

Where many of the people went, assuming that a diminution of sites and cultural remains indicates at least partial abandonment, also remains to be determined. The period represented by the Phenix and Seven Rivers phases (the latter including the early Spanish explorations in the late 1500s) is unknown archaeologically. Abandoned *rancherias* described by early Spanish explorers of the Seven Rivers region certainly indicate the presence of hunter-gatherers during the protohistoric and early historic periods (Schroeder and Matson 1965), but the inhabitants—possibly Jumanos or Apaches (Hickerson 1994)—effectively disappeared as an identifiable people before more detailed accounts and relationships could be recorded.

European Entry into Southeastern New Mexico

From Spanish contact until after the American Civil War, roaming Apaches, Comanches, Kiowas, and other Plains tribes kept Euroamerican settlement of southeastern New Mexico in abeyance. Following the Civil War, the westward mass movement of Americans and eastward drift of small groups of New Mexico Hispanics led to settlement of the region. Cattle ranching was the first economic activity to start up, but by about 1890 the loss of government contracts and influx of farmers reduced its commanding economic position in the region.

Farming, particularly in the Roswell area, provided an increasingly important base for the local economy, especially after the discovery of artesian water. Development of an irrigation system based on this water promoted widespread farming throughout the valley between Roswell and Carlsbad and resulted in a rapid influx of people.

The railroad reached Carlsbad in 1891 and Roswell in 1894, irretrievably setting the course for urbanization of the area. At the turn of the century, the region's economy became firmly based in agriculture, stockraising, and, in the mid-twentieth century, the production of oil and gas.

CHAPTER 4

Previous Archaeological Work in the Area

Except for a number of small-scale contract archaeological projects associated with oil and gas exploration, archaeological investigations in the Roswell area have been few in number. The list below includes some of the more significant investigations. Except where noted, the sites are prehistoric.

Akins 2003: Further excavation at the Townsend (Salt Creek) site north of Roswell; several small, oval pitrooms and wickiup floors excavated, all dating to the late prehistoric (pottery) phases.

Bullock 1999: Excavation of four sites east of Roswell, including one with a wickiup floor that dates to the late prehistoric (pottery) period.

Hannaford 1981: Testing of 24 lithic artifact sites west of Roswell.

Jelinek 1967: Survey and excavation along the Middle Pecos River northeast of Roswell; defined culture sequence from Paleoindian to late prehistoric for Fort Sumner section of Pecos River; excavations focused on late prehistoric (pottery) phases.

Kelley 1984: Excavation at Bloom Mound southwest of Roswell; excavation in pueblo and pit structure dating to A.D. 1300s.

Kemrer and Kearns 1984: Sample survey of the Abo Oil Field north of Roswell; documented a wide range of site types, probably all of which are campsites, lithic material collection/quarry areas, and food-collecting sites; no structural sites identified with certainty.

Maxwell 1986: Testing of the Townsend site north of Roswell; recovered hearths, artifacts, and animal bones from three time periods defined by radiocarbon dates: 490-250 B.C. (pre-pottery), A.D. 460-820 (pottery and corner-notched arrow points), and A.D. 1200-1400 (pottery and side-notched arrow points); bison bones associated with earliest and latest periods.

Oakes 1983: Excavation of the historic period Ontiberos Homestead west of Roswell.

Parry and Speth 1984; Speth 1983: Excavation of the Garnsey Spring Campsite (pottery period and possibly some Late Archaic remains) and the protohistoric Garnsey Bison Kill east of Roswell.

Phillips et al. 1981: Survey of the Two Rivers Reservoir southwest of Roswell; documented lithic material quarries, camp sites, food collecting sites, and probable pottery period structural sites.

Rocek and Speth 1986: Excavation at the Henderson site southwest of Roswell; excavation in surface rooms and pit structures dating to A.D. 1200s and 1300s.

Schermer 1980: Excavations at several sites in the Haystack Mountain area northeast of Roswell; test excavations at several pottery period camp sites; darts points at several of the sites may indicate Archaic occupations as well.

Wiseman 1985: Excavation at the Rocky Arroyo site south of Roswell; excavation of a large, deep pit structure in a small village dating to the A.D. 1200s.

Wiseman 2000a: Excavation at the Bob Crosby Draw site (LA 75163) northeast of Roswell; excavation of a portion of a multicomponent dune site dating to the period A.D. 800-1350, perhaps earlier; analyses in progress.

Wiseman 2002: Excavation of the Fox Place site at Roswell; excavation of part of a large village containing numerous tiny pit structures and one large, deep ceremonial pit structure, all dating to the A.D. 1200s and early 1300s.

CHAPTER 5

Research Perspectives

To place the following chapters in the context of this investigation, portions of the original data recovery plan are presented below.

Before proceeding, it should be noted that there is one major difference between the original data recovery plan and the version presented here. The original plan also included a section for LA 54346—the Cass homestead, which dates to the early part of the twentieth century. The LA 54346 report will be written by Jeffrey L. Boyer of the OAS and will be published separately.

Introduction

Three of the project sites (LA 68183, LA 54347, LA 68185) represent Archaic and/or prehistoric ceramic period, open camp occupations. LA 68182 is currently undated, but is presumed to be prehistoric. The estimated overall date range for the sites is 3000 B.C. to A.D. 1300. Within this range, the sites were used for small segments of time, and further research will help fill in some of the missing details of the regional prehistory. Consequently, the data recovery plan for the Roswell Relief Route prehistoric sites will be presented in the framework of the Archaic and ceramic periods, drawing heavily from the existing literature to round out the picture.

The Archaic occupation of southeastern New Mexico has been recognized for some time (Stuart and Gauthier 1981; Kemrer and Kearns 1984), and a coherent scheme of Archaic cultural development was devised by Katz and Katz (1985a). Although this scheme pertains specifically to the Pecos River and environs 50 to 60 km south of Roswell, it is a starting point for the study of Archaic adaptations in all of southeastern New Mexico.

Archaic sites in the Carlsbad and Roswell regions, as elsewhere in the Southwest, are usually open sites characterized by a scattering of Archaic projectile points, lithic debitage, and at least some burned rock. Actual hearths and grinding stones may or may not be present. It is believed that the economy of the people who occupied these sites was based on hunting a variety of mostly small animals, such as rabbits and rodents, and collecting wild plant foods. However, preservation in shallow open sites is usually poor, and confirmation of data on diet is spotty and slow in coming.

Another key element in the regional Archaic picture has recently been added. The Sunset Archaic site (Wiseman 1996a) has large storage pits, rock hearths, a substantial midden, and clear-cut evidence of a low-level but well-established practice of corn horticulture. The site dates to the first five centuries A.D.

Turning to the late prehistoric period, we have the so-called sedentary Jornada-Mogollon occupation in the Roswell area. Sites such as Bloom Mound (Kelley 1984), Rocky Arroyo (Wiseman 1985), Henderson (Rocek and Speth 1986), and the Fox Place (Wiseman 2002) were substantial occupations with numerous structures, refuse middens, pottery, diverse faunal assemblages, and corn horticulture. We assume that wild plant foods also played an important role in the diet, but studies of flotation samples from Rocky Arroyo, Henderson, and the Fox Place are not yet available.

Another problem, as yet unresolved, has recently presented itself—the possibility that late prehistoric hunter-gatherers lived near or even among the village-dwelling Jornada-Mogollon people (Sebastian and Larralde 1989). Ongoing attempts to determine whether these hunter-gatherers existed and how to distinguish their sites from Jornada-Mogollon hunting-and-gathering sites have been disappointing (Wiseman 1996a). Nevertheless, until proven otherwise, we must contend with the probability that vegetal gathering and processing sites in the Roswell area were created by two different, though at least partially interrelated, cultural systems.

As of this writing, a number of shallow, open-air, nonarchitectural campsites have been tested or excavated in the greater Roswell region, but most are east and south of Carlsbad. Few sites in the immediate vicinity of Roswell have been investigated beyond the survey stage (Hannaford 1981; Hicks 1982; Maxwell 1986; Parry and Speth 1984; Schermer 1980; Wiseman 1971).

Kemrer and Kearns (1984) have defined several types of campsites in the area immediately north of

Roswell: multiple-use locales, temporary camp locales, lithic-procurement and workshop locales, and limited-activity locales/task-specific campsites. The site types have several subtypes, each designated by an alpha-numeric code that can be expanded upon as needed.

The primary attributes used in the Kemrer-Kearns system are site size and the presence or absence of hearths, burned rock, chipping debris, milling equipment, projectile points, and pottery. The sites covered in this report are categorized in this system as follows:

- LA 54347 (Middle to Late Archaic): multiple-use locale, type uncertain.
- LA 68182 (bedrock mortar site): limited-activity site.
- LA 68183 (Formative): temporary camp.

(The hearth scheduled for excavation at LA 68185—Sitio Largo—was lost under flood-borne silt and, therefore, not excavated. For this reason, LA 68185 is omitted from many sections of this report.)

Bedrock mortar sites are uncommon in the Roswell area (cf. Bond 1979; Schermer 1980) but fairly common in the Carlsbad region, 50 to 60 km to the south (Katz and Katz 1985a). This may in part be a function of the availability of suitable rock exposures.

To summarize, the project sites are nonarchitectural open sites that represent several prehistoric time periods: LA 54347 is Archaic; LA 68182 and LA 68183 probably represent hunting and/or gathering sites of the village-dwelling Jornada-Mogollon, or possibly an as yet undefined hunter-gatherer occupation of the Roswell area. Although these pottery period sites cannot be expected to assist in differentiating between these two "cultures," they can give us a glimpse into generalized hunting and gathering activities in the Roswell area during late prehistoric times.

Data Recovery Questions and Requirements

1. What Are the Ages of the Sites?

The key to success in studying southeastern New Mexico prehistory, as elsewhere, is the ability to accurately date sites and other manifestations. Dating in southeastern New Mexico is such a critical problem that recent overviews give it number-one priority (Kemrer and Kearns 1984; Sebastian and Larralde 1989).

Datable materials such as wood charcoal are so rare that relatively few absolute dates are available for thousands of square kilometers. So many nondatable wood specimens come from complacent trees that the Tree-Ring Laboratory at the University of Arizona actually discourages submissions from the region. To further complicate matters, pottery cross-dating rarely works well here because the most common types are poorly dated, long-lived, or both. Dating by projectile point styles suffers many of the same problems. In effect, archaeological studies in southeastern New Mexico have been severely hampered by the lack of adequately dated sites. Thus, the acquisition of datable materials is a high-priority task for all occupation periods.

One of the primary requirements for sound dating is to accurately relate one site to another and one cultural period to another. We need to know which remains are earlier, which are later, and which are possibly contemporary. For instance, we have reason to believe that terminal Archaic sites date as late as A.D. 750 or even 1000, but need to confirm this to clarify our assessments of thousands of lithic sites (Kemrer and Kearns 1984; Sebastian and Larralde 1989).

Successful assessment of lithic sites in general will permit us to close the gap between the terminal Archaic and ceramic period remains. Only when we can control the time factor can we accurately assess cultural relationships, settle the question of late prehistoric hunter-gatherers, and trace changes through time and space.

The Roswell Relief Route sites can be expected to produce several kinds of datable materials. We anticipate the recovery of wood charcoal for radiocarbon dating, the technique most likely to give the desired results. We may also recover burned clay samples (from hearths, for instance) appropriate for archaeomagnetic dating. Small pieces of obsidian, useful for hydration dating, are also occasionally found in southeastern New Mexico sites. Although hydration dating as an absolute technique is questionable, its use in relative dating (Archaic versus pottery period in most instances) has been fairly well received. We will collect and date as many of these types of samples as feasible.

In the event that charcoal, burned clay, and obsidian are not recovered, we will approach dating through lithic debitage analysis. Numerous studies in the Southwest have suggested that Archaic and Formative period sites can be distinguished from one another on the basis of chipping debris (Sebastian and Larralde 1989). Attributes such as platform-edge grinding, quantity of cortex, flake sizes, and biface-thinning flakes have been used with some success.

2. How Were the Sites Used and Why?

LA 68182, LA 18183, and LA 54347 clearly represent different functions as well as different time periods. They will be studied first with respect to their age and then compared through time with earlier and later project sites and with manifestations described in the literature.

The Archaic site (LA 54347) consists of hearths, scattered burned rock, and a light artifact scatter, all of which suggest occupations of short duration, possibly for hunting or wild plant-food collecting. Within the right-of-way, we will excavate the hearths, search for associated use-surfaces, map and collect the artifacts, and obtain flotation samples to determine more precisely what activities were carried out at each site.

A determination of the physical relationships among the remains will be critical in establishing the patterns of use, temporal relationships, and kinds of activities. Flotation samples from the hearths may provide remains of animal and plant species used for food as well as for fuel, and will assist in interpreting the functions of the sites.

The ceramic period campsite (LA 68183) will be excavated and studied in the same manner as LA 54347. It is possible that the bedrock mortar site (LA 68182), immediately south of LA 68183, was contemporary with the camp site. Data that might be used to support this suggestion are the proximity of the two sites, the location of LA 68183 with respect to the nearby river, the near absence of domestic trash at LA 68182, and the fact that LA 68183 is located in a low, protected place, shielded from the southwesterly winds.

An attempt will be made to establish temporal and functional relationships between LA 68182 and LA 68183 by collecting datable materials and samples of sediment for flotation and pollen analyses. The latter will be taken from the bottom fills of the mortar holes and the contents of the hearth. The occurrence of the same plant species at the sites would support a functional relationship. Similar dates would strengthen the idea of a temporal link, but datable materials probably will not be forthcoming from LA 68182.

Once function data for each site have been assembled, broader exploitation patterns will be delineated. Information will also be gleaned from the pertinent literature to round out the perspective. The reconstructions for each period will in turn be compared to and contrasted with the entire time line (Middle Archaic through late Formative). The end product will be a chronicle of human adaptation through time in the greater Roswell area.

3. What Animal and Plant Species Were Used for Food and Fuel? Were the Species the Same or Did they Change through Time?

The acquisition of food is a fundamental human activity. The food quest constantly shapes the way in which individuals and groups structure their lives and use their environment. Thus, some of the more important focal points in archaeological studies are the discovery of what plant and animal species were used, how they were combined into the diet (what mix of wild and domesticated species was used and why), what scheduling was required to maintain the diet, and how the landscape was used to obtain the diet. If changes in the diet took place, then it is necessary to investigate when and why they happened.

Fuel for fires is also very important, particularly where diurnal and annual temperature changes are substantial. Wood charcoal from hearths reveals the kind of fuel used for cooking and heating, and provides data about the local environment.

All of these questions will be addressed, as far as possible, at each of the project sites. Once the reconstructions have been made on a site-by-site basis, the analysis will be extended to a characterization of each period (Archaic, Formative), and then to the culture history sequence as a whole. An important aspect of this last analysis will be an assessment of whether the Roswell area Archaic adaptation was riverine-oriented, as in the Carlsbad area, or whether it was more like the xeric adaptations of other southwestern Archaic groups.

CHAPTER 6

LA 68182—Los Molinos

Site Description

LA 68182—Los Molinos—was originally described as a bedrock mortar site with a thin scatter of lithics. The mortars occurred in four groups in as many outcrops widely spaced across the site. The lithics were not concentrated but seemed to occur throughout the site. Not long into the data recovery phase we discovered that a natural crevice in the top of the hill was filled with rich, organically stained cultural fill, all effectively masked by a fairly dense patch of grass. The site measured 240 m long by 135 m wide and is situated on top of a rocky hill at an elevation of 3,640 ft (1,109 m) above mean sea level and 7 m above the channel of the nearby Middle Berrendo River (Fig. 2).

Vegetation on the site surface at the start of excavations was thinly spaced bunches of grass with occasional thicker concentrations. Bedrock and bedrock fragments were readily observed virtually everywhere on the surface (Fig. 3).

The site provides an excellent view for several hundred meters both up and down the river channel. Before Euroamerican settlement, the stream probably ran year round. The vegetation today is desert grassland with occasional tamarisk trees along the river channel.

Field Activities and Description of Crevice and Midden

The first activity at this site was to pinflag all surface artifacts. It rapidly became apparent that the supposed thin lithic scatter was really a large, dense accumulation of small lithic debris and pottery sherds. The main concentration measured 30 m north-south by 26 m east-west and was contained within the area defined by

Figure 2. LA 68182: situated on hilltop (looking north).

Figure 3. LA 68182: before excavation; site in fore and middle ground (looking west).

Bedrock Feature (BRF) Group A on the north and BRF Group D on the south. A wider area measuring 46 m north-south by 52 m east-west and centered on the main concentration was inventoried. The artifacts thinned in all directions from these limits, and only small areas surrounding BRF Group B and BRF Group C were inventoried.

The site datum was established along the then-existing right-of-way fence that ran north-south along the east side of the main artifact concentration. The same right-of-way fence was then designated as the main baseline of the site grid. Chaining pins were set out at key points of the grid to facilitate collection of the surface artifacts and, later, to establish the squares of the grid to be excavated.

The surface artifacts were collected in 2-by-2-m surface units delineated by parallel 50-m tapes laid down between opposite points on the grid. Artifact numbers varied from 0 to 86 per surface unit (0 to 21.5 per square meter). A total of 592 surface units (2,368 square meters of site surface) were collected in the main site area (vicinities of BRF Groups A and D). Fifteen surface units (60 square meters) were collected at BRF Group B, and 50 surface units (200 square meters) were collected at BRF Group C. Thus, surface artifacts were collected from a grand total of 657 surface units, totaling 2,628 square meters of site surface.

The surface artifact total for all three areas combined was 7,093 cores and flakes, 456 pottery sherds, 35 formal artifact fragments, and 5 fragments of bone and shell. This is for a site surface that the author believed would yield 40 to 50 lithic artifacts.

The lesson learned from this was obviously important. Upon lengthy reflection, it is apparent that several factors led to this miscalculation. Perhaps most serious were the extreme heat of the day and the misery and fatigue it induced (surveyed in August), the high reflectivity (glare) of the rocky ground surface, and the small average size of the artifacts (about the size of a five-cent coin). Then there was the inevitable expectation that no serious prehistoric occupation would be found on top of a hill that appeared to be one large, sparsely-vegetated rock.

The density of surface artifacts necessitated the excavation of fourteen 1-by-1-m excavation units laid out randomly across the densest part of the concentration. Excavation proceeded in 10-cm levels, and the fill was screened through quarter-inch wire mesh. The next big surprise was encountered immediately. Instead of bedrock just below the grass and thin soil, the first excavation unit sank into a nearly black cultural deposit that went as deep as 90 cm in places. The bedrock itself is a carbonate-cemented pebble conglomerate that interfaces in places with a gritty limestone-like rock.

The Native Americans had discovered a natural crack or crevice in the bedrock and had filled it full and overflowing with trash (Figs. 4 through 8). Thousands of sherds, pieces of lithic manufacture debris, animal bones, broken formal artifacts, and even a human interment, all mixed with large quantities of natural rock

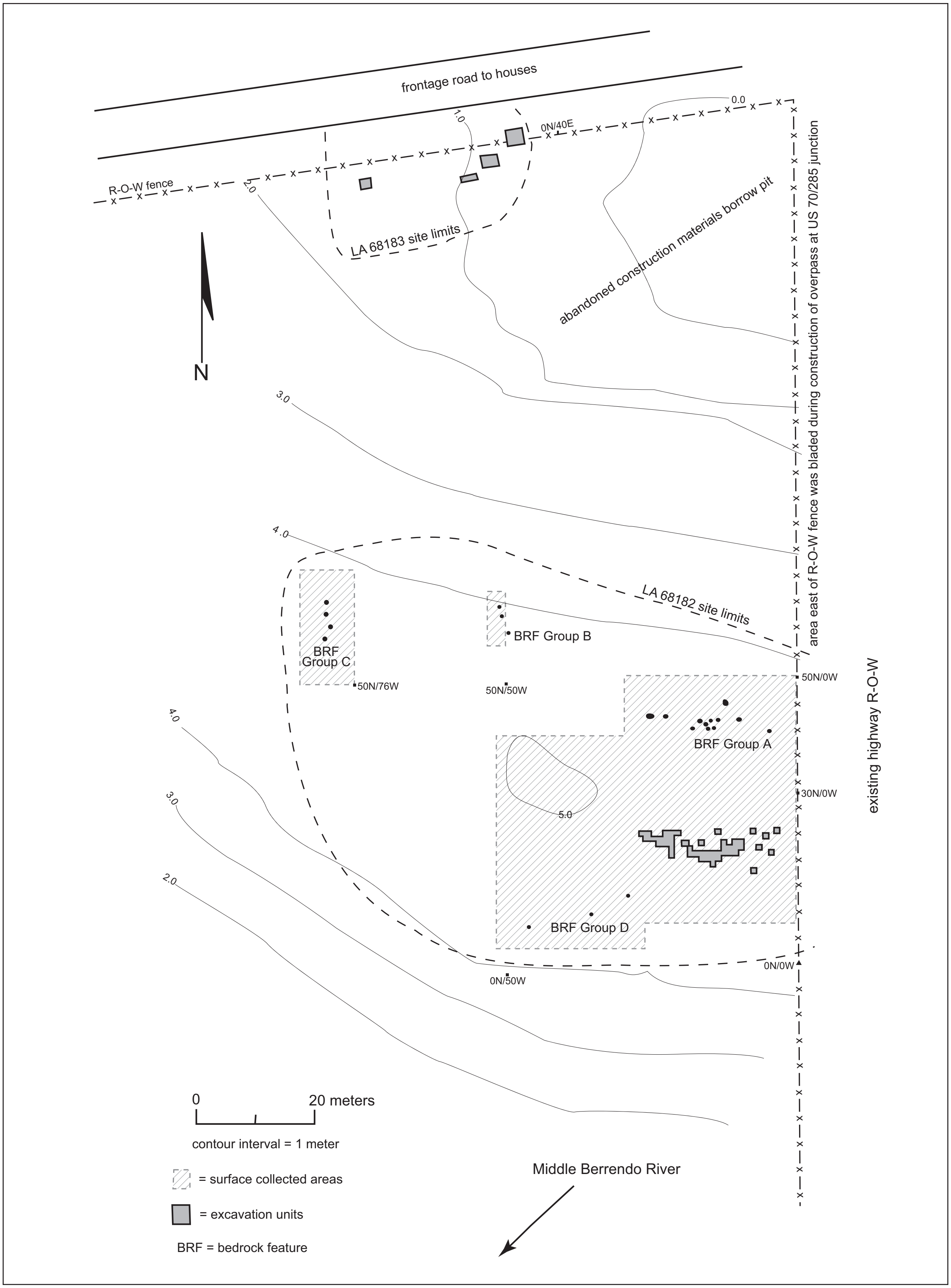

Figure 4. LA 68182 and LA 68183: site map.

Figure 5. LA 68182: general view of crevice during excavation (looking southwest).

Figure 6. LA 68182: general view of crevice; note flotation sample column to left of meter stick (looking west).

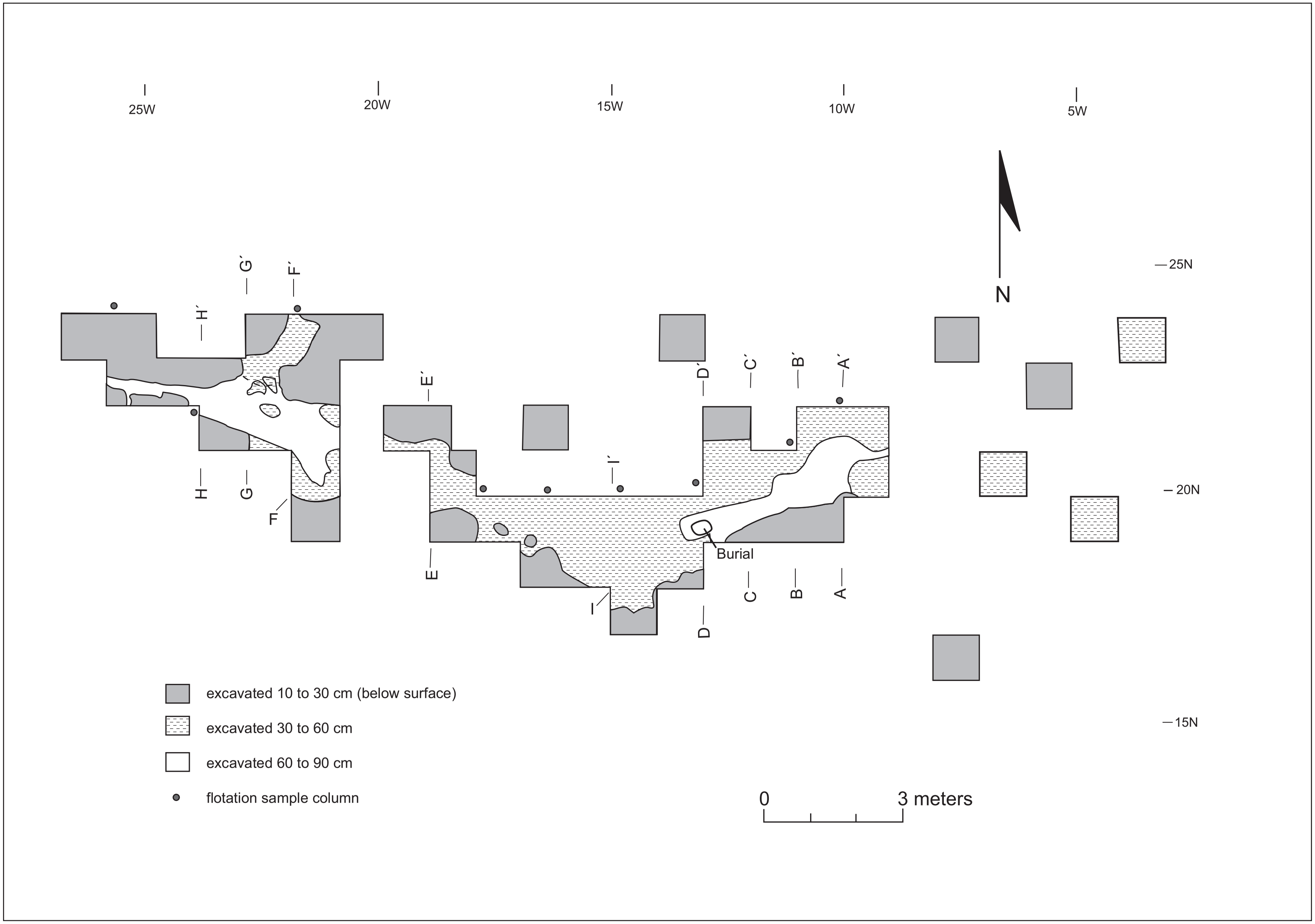

Figure 7. LA 68182: excavated squares showing crevice.

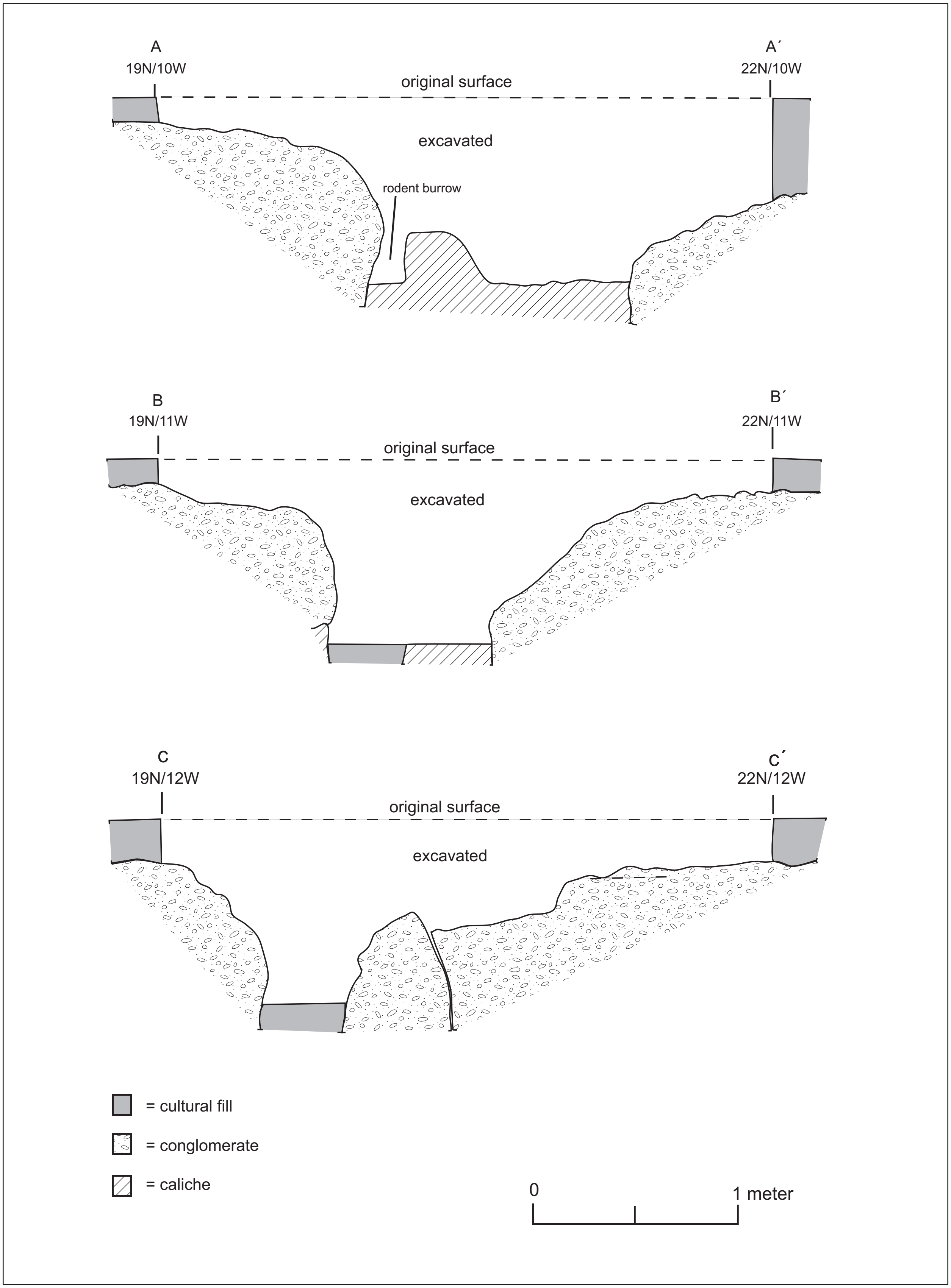

Figure 8a. LA 68182 crevice profiles A-A', B-B', C-C'.

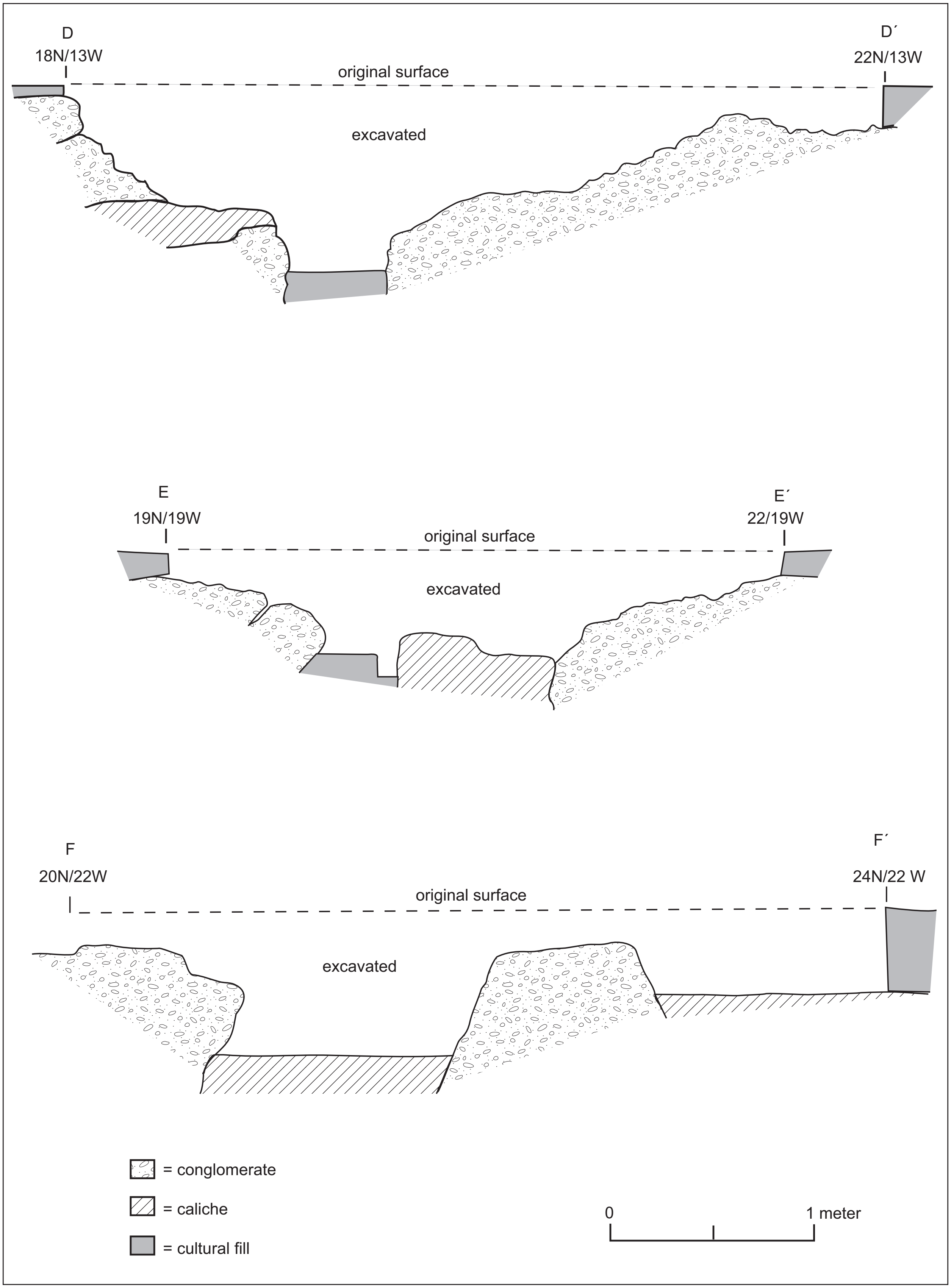

Figure 8b. LA 68182 crevice profiles D-D', E-E', F-F'.

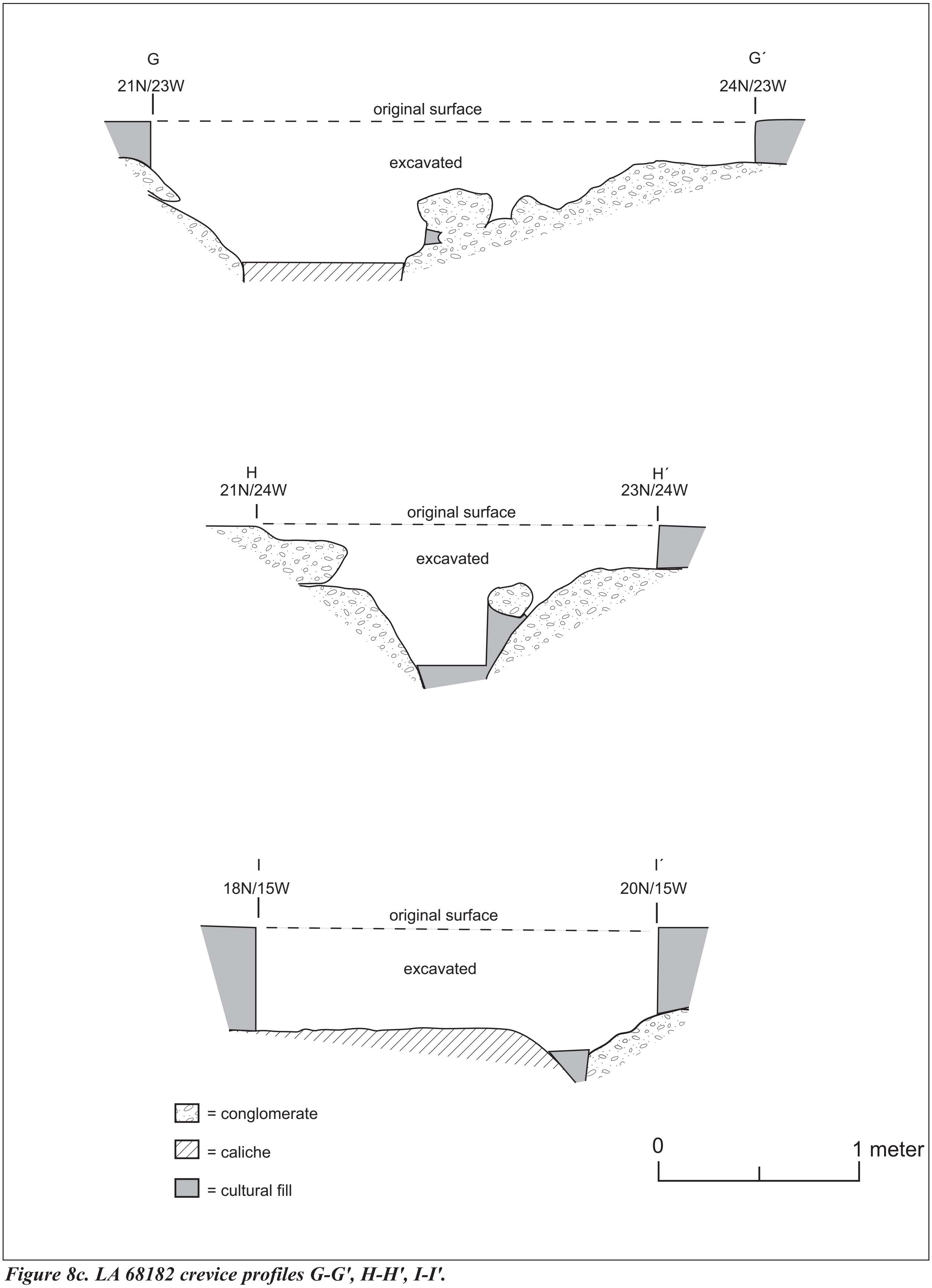

Figure 8c. LA 68182 crevice profiles G-G', H-H', I-I'.

fragments, were eventually exposed and recovered. The crevice varied from 25 cm to nearly 2 m wide and 18 m long. The final depth was never determined, but cultural materials attained a maximum depth of 90 cm. A soft, easily dug, off-white, caliche-like powder and rock fragments underlay the cultural deposits to an unknown depth.

Given that the cultural deposit, including the nearly black fill, spread both north and south outside the crevice (albeit 10 to 15 cm thick and thinning with distance from the crevice), why was it not discovered earlier? The answer is simple—the uppermost 5 to 10 mm of the surface soil were bleached to a much lighter color by years of exposure to the elements. Once intense pedestrian activity (pinflagging artifacts, setting up the grid, etc.) focused in the relatively small area, including hands-and-knees work to find very small artifacts, the surface soil was sufficiently disturbed to reveal the underlying dark fill.

Once requisite permissions and notifications were made, the work settled into systematic excavation of 1-by-1-m excavation units to follow and expose the crevice. The levels and screening were as described above. By the end of the project, 46.5 square meters (including exploratory test pits) had been excavated. The natural crevice was exposed almost in its entirety, and exploratory test pits revealed that this unique feature simply attenuated off at both (east and west) ends.

The black cultural fill outside the limits of the crevice stretched for a few meters both to the north and to the south. We believe that the original extent of the black fill was once greater, as defined by the distribution of the dense surface artifact concentration. We assume that the absence of the dark fill over much of this core area of artifacts is a simple function of weathering (especially by spring winds) and livestock grazing through time.

If our assumption is correct, then the original extent of this midden was in the order of 30 m north-south by 26 m east-west (as noted earlier). This puts the main mass of the deposit directly on top of the hill with the crevice through the south half, and with Bedrock Feature (BRF) Group A serving as the northern limit. BRF Group D lies on the upper slope of the hill a short distance to the southwest of the south limit.

Human Interment

The single human interment was recovered from square 20N 13W at a depth of 60 to 93 cm below modern surface (Fig. 9). This location and depth are at the bottom of the crevice. The grave fill did not differ from the generic cultural fill of the crevice.

The grave pit had been dug into a combination of cultural fill and bedrock caliche. The outline of the west end of the pit was in caliche and was well defined. The east end, being in cultural fill, could not be defined. The north and south sides of the pit were constrained by the sides of the crevice. Overall pit dimensions appear to have been about 90 cm long by 60 cm wide by 33 cm deep. The orientation, as determined by the crevice, was nearly east-west. The pit was not lined or otherwise improved. We could not discern the upper pit sides, which precluded discovery of the original ground surface at the time the burial pit was dug.

Judging by the positions of the leg bones, the body had been buried in a fully flexed position, possibly on its left side, with the head to the east. Details of positioning are sketchy because of severe rodent disturbance and displacement of the bones. For instance, cranial, mandibular, and pelvic fragments ranged from one end of the pit to the other, and many of the smaller bones were missing. A number of teeth, small bones, and bone fragments were recovered from excavation units in the vicinity. No identifiable or potential grave goods were recovered from the burial pit or anywhere nearby. The human remains are described and discussed by Akins in Chapter 14 of this report.

Bedrock Grinding Features

From the beginning, four groups of bedrock grinding facilities were the only readily visible features at LA 68182 (see Fig. 4). Systematic exposure and excavation resulted in the documentation of 102 individual and combination basin metate and mortar features (Figs. 10 through 16). Of these, as many as 14 individual depressions and one combination feature are questionable as cultural features—that is, they could be natural. This uncertainty in part revolves around the nature of the bedrock and the potential effects of weathering on the rock.

Characteristics of the Bedrock

As mentioned earlier, the bedrock of the hill is a carbonate-cemented pebble conglomerate that interfaces with a grainy limestone-like rock. The grinding features were located in both types of rock, though the grainy limestone was preferred almost two to one over the conglomerate (Appendix A). All of these exposures are at ground level and are subject to sheet flooding during heavy rains.

Over time, the rock slowly dissolves due to the corrosive effects of carbonic acid formed by atmospheric

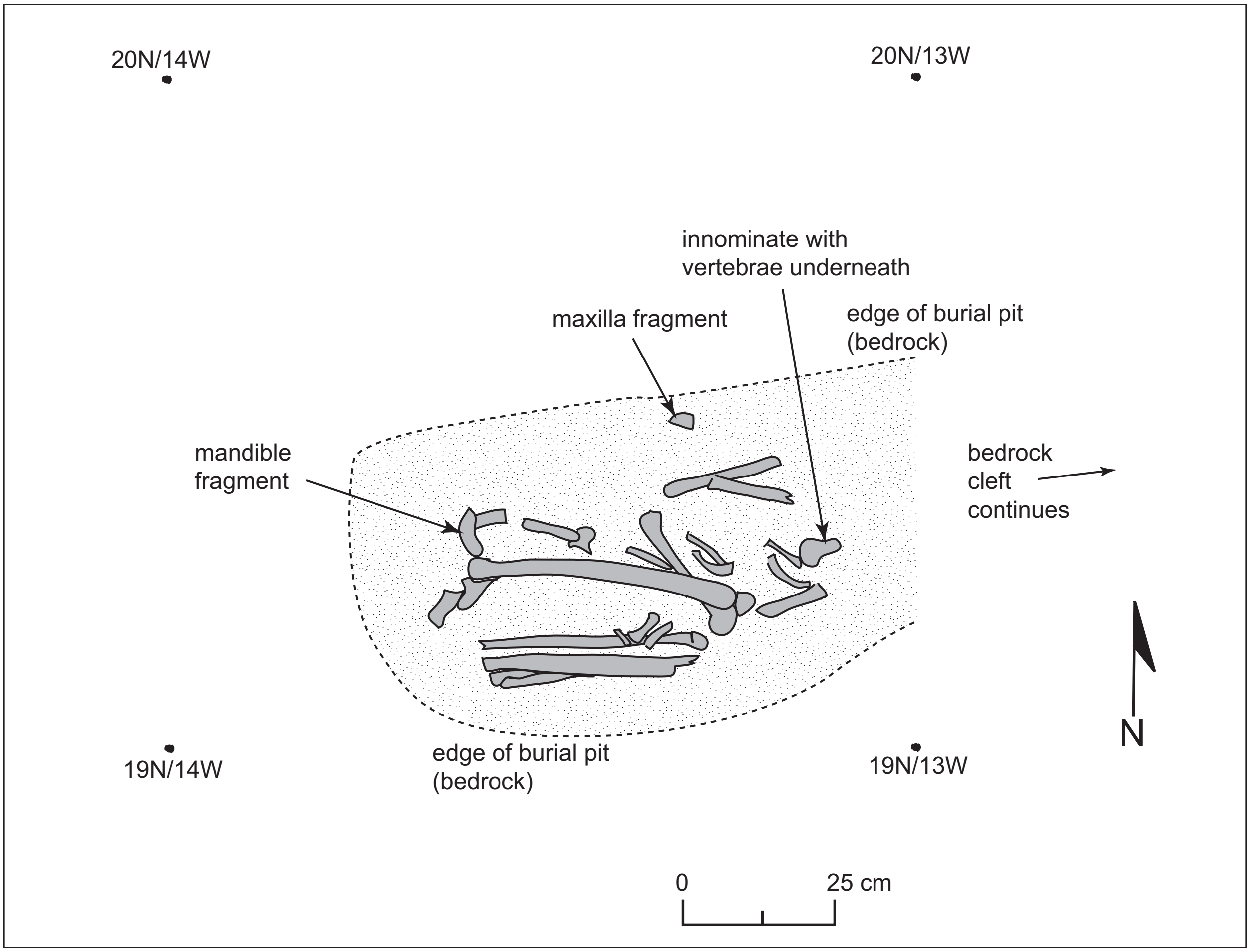

Figure 9. LA 68182: human burial.

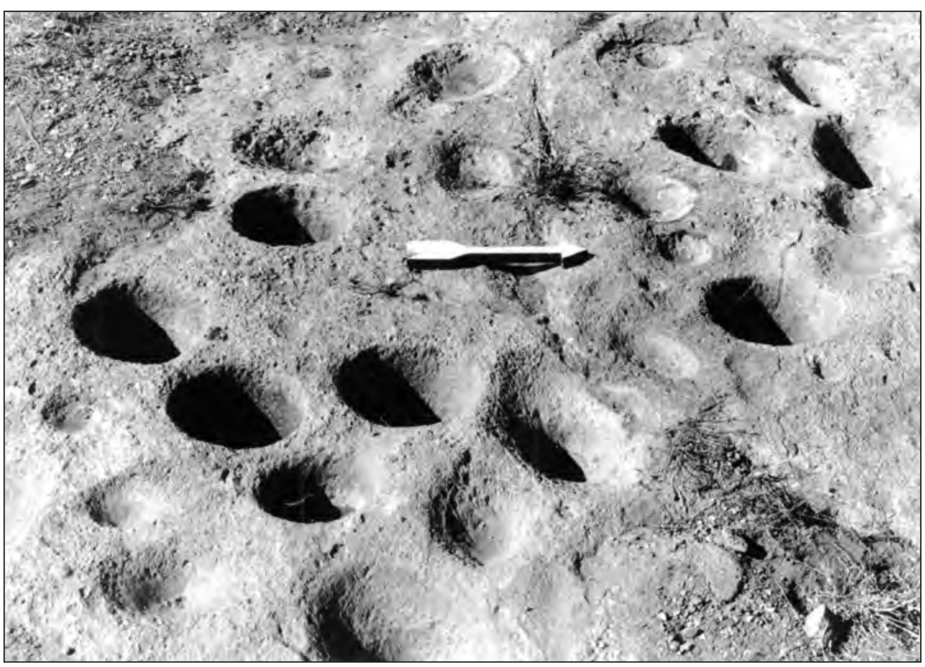

Figure 10. LA 68182: Group A bedrock grinding features (looking west).

Figure 11. LA 68182: Group A bedrock features (main group).

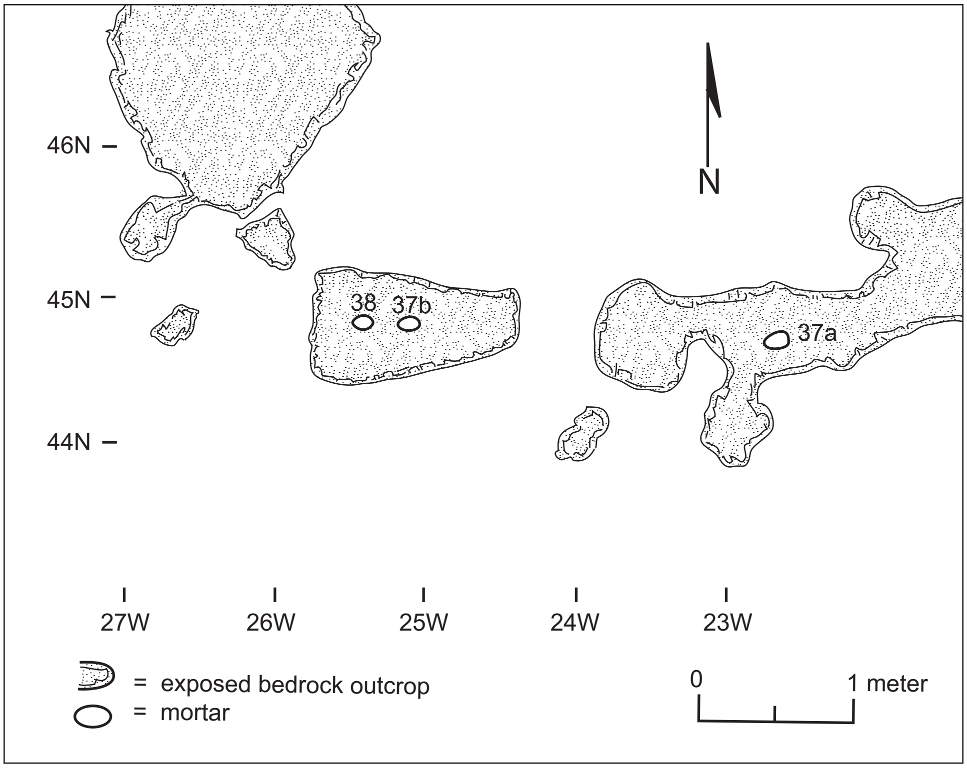

Figure 12. LA 68182: Group A bedrock features (west of main group).

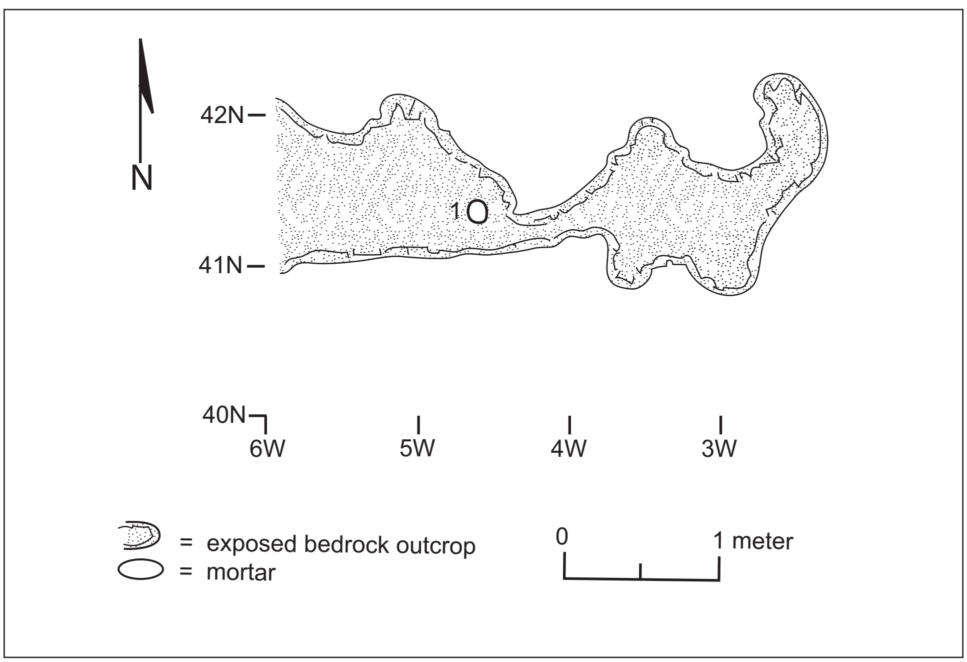

Figure 13. LA 68182: Group A bedrock features (east of main group).

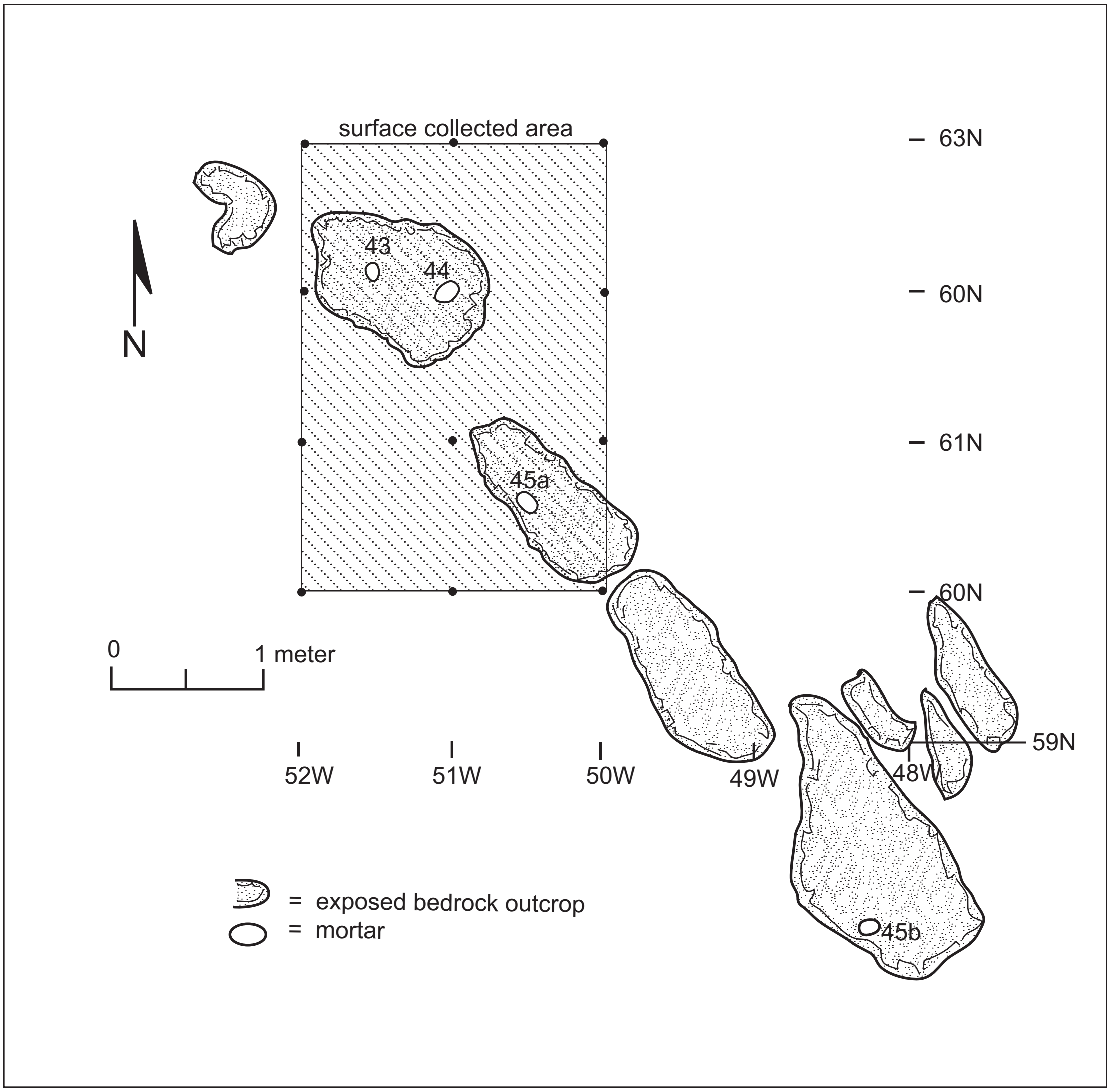

Figure 14. LA 68182: Group B bedrock features.

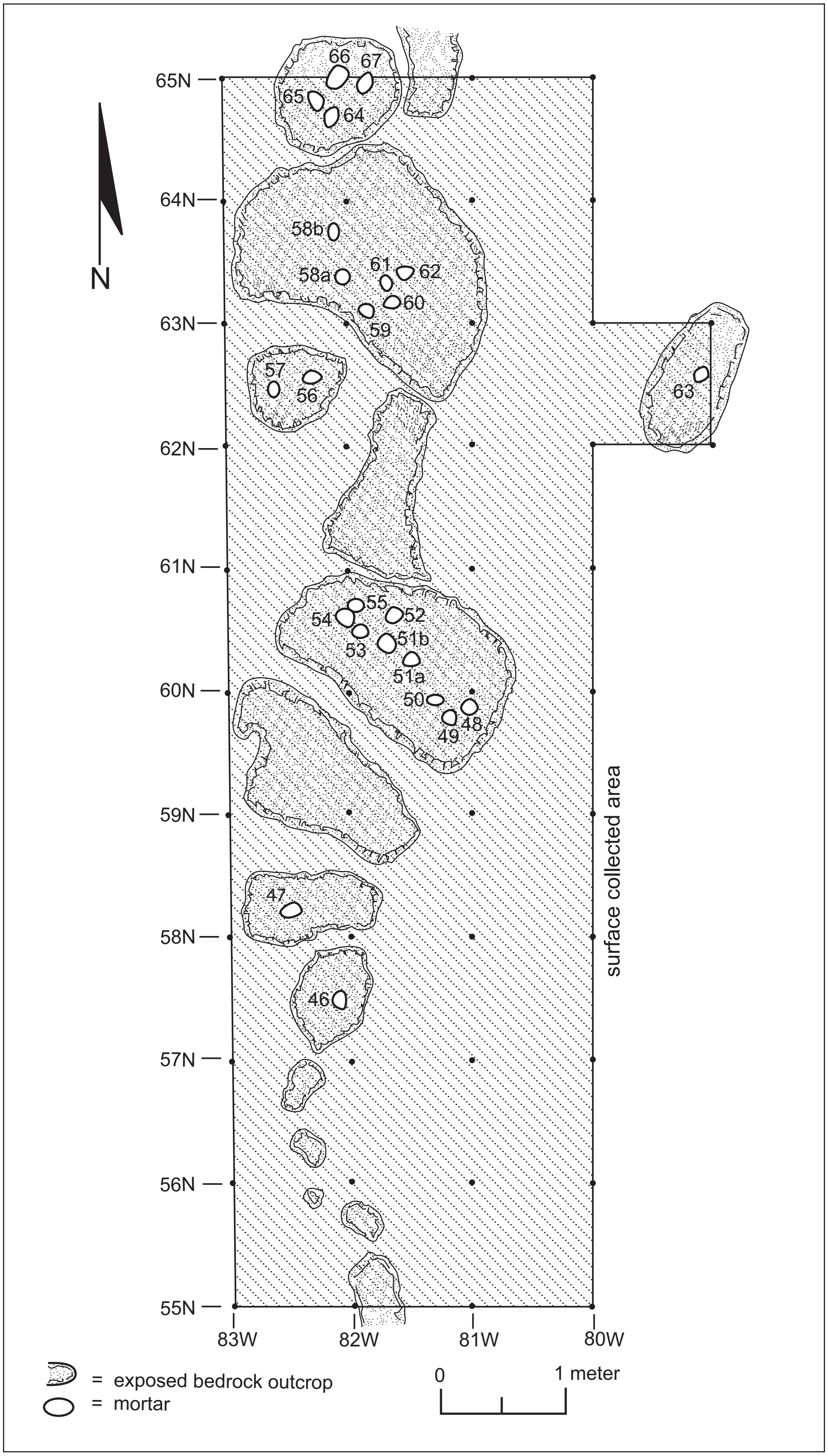

Figure 15. LA 68182: Group C bedrock features.

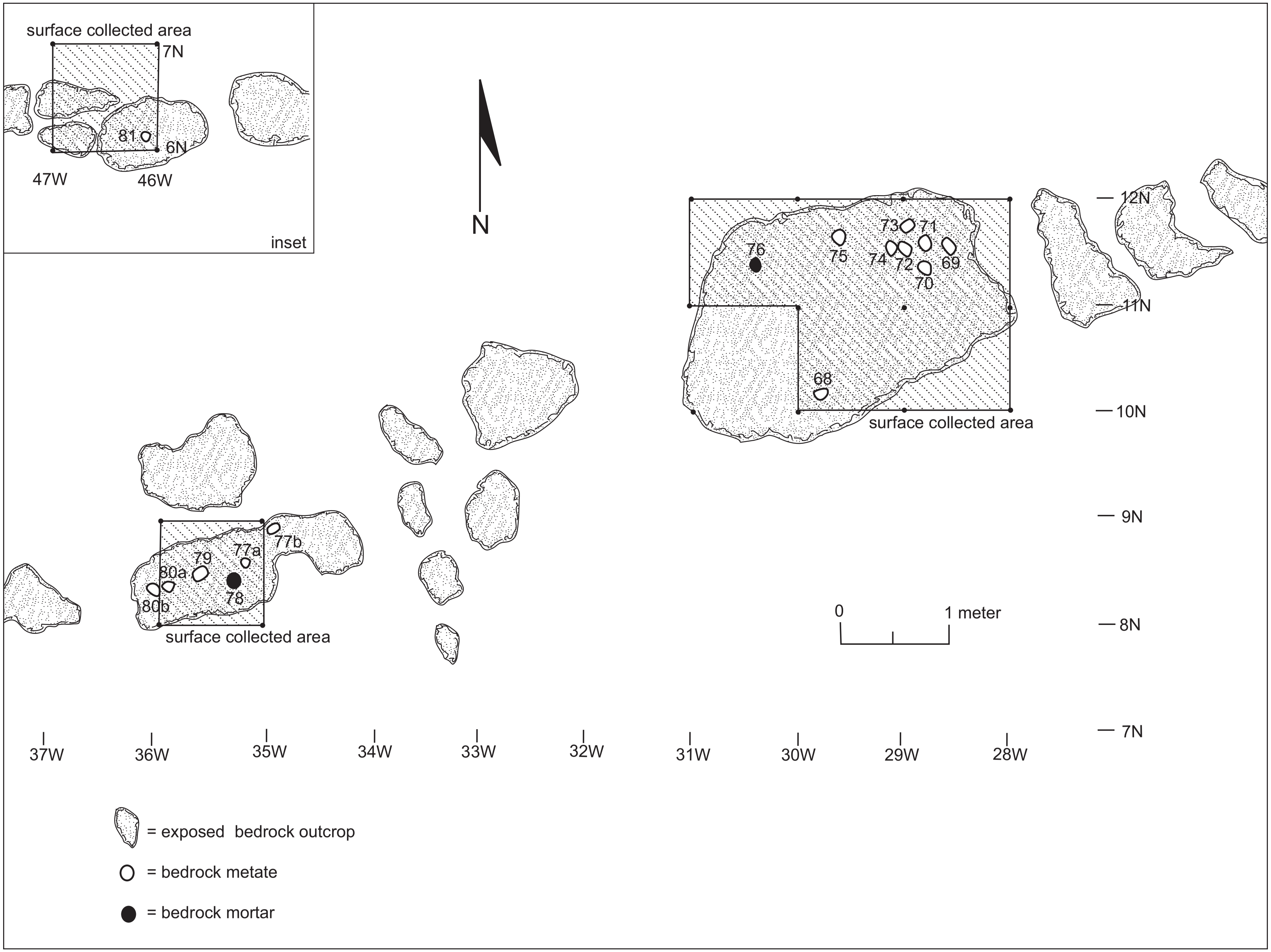

Figure 16. LA 68182: Group D bedrock features.

carbon dioxide dissolving in falling rain. A few millimeters of rock surface dissolved in this manner will remove virtually all traces of cultural modification other than a depression with scalloped edges and a slightly irregular bottom.

The Grinding Features

Two types of bedrock grinding features in three manifestations are represented at LA 68182: basin metates (n=47), mortars (n=17), and combination basin metates/mortars (n=12 loci, 24 grinding features) (Appendix A). The combination features are basin metates that were later used as starting places for mortars.

Although it would seem that distinguishing between basin metates and mortars should be straightforward, such was not the case at LA 68182. The early-stage examples create the problem—evident during both field recording and laboratory study of the metric dimensions (Figs. 17 through 20).

Basin metates. These grinding features are essentially identical to their portable namesakes except that they are in bedrock surfaces. Of the 47 single basin metates defined in the field, 26 are in limestone, and 21 are in pebble conglomerate.

The majority of well-developed examples of these shallow, oval basins (Appendix A) at LA 68182 range from 15 to 28 cm long, from 10 to 18 cm wide, and from 1.5 to 10 cm deep. Ratios of length to width to depth range from 14:9:1 to 8:6:1. One large, well-developed example (no. 40) falls outside this range because of its greater width (21 cm).

Three other examples originally recorded as basin metates (nos. 2, 22, 28b) fall below the lower end of the size range of the well-developed metates. These examples might represent early-stage mortars, though their depths (1 to 1.5 cm) are shallow relative to their grinding-surface sizes (12 to 14 cm long by 9 cm wide).

Mortars. The most obvious examples of mortars are well-developed, large, deep holes in the bedrock. Of the 17 single mortars, 15 are in limestone, and only 2 are in pebble conglomerate.

The orifices of well-developed mortars range from perfectly round to oval, from 15 to 24 cm long, and from 13 to 20 cm wide. Depths range from 10 to 23 cm. Ratios of length to width to depth range from 4:4:1 (rounded) to 3:3:1 (rounded).

Four early-stage mortars (nos. 7b, 12, 16, 28a) are smaller and shallower. They are distinguishable from early-stage basin metates primarily by their greater depths relative to the orifice sizes. Orifices range from 9 to 10 cm long and from 7 to 10 cm wide, and depths range from 2.5 to 3 cm.

Combination features. Combination features have larger grinding surfaces with smaller grinding surfaces placed within them. We had assumed in the field that the larger grinding surfaces were basin metates and that the smaller, later ones were early-stage mortars. Exceptions include no. 66, which consists of two basin metates, and no. 81, which may be a basin metate within a natural depression rather than another cultural feature. Of the 12 combination features, 8 are in limestone, and 4 are in pebble conglomerate.

The larger grinding surfaces (metates) range from 15 to 32 cm long, from 13 to 21 cm wide, and from 1 to 5 cm deep. Ratios of length to width to depth range from 15:13:1 to 6:4:1. These ratios are clearly more like those of the single basin metates.

The smaller grinding surfaces (mortars) range from 9 to 20 cm long, from 8 to 13 cm wide, and from 2 to 5 cm deep. Ratios of length to width to depth ratios range from 5:4:1 (rounded) to 4:3:1 (rounded). These ratios are clearly more similar to those of single mortars.

However, there is a problem with the basic assumption that the components of these features are a basin metate and a mortar. They do not group neatly with any of the basin metate and mortar plots in Fig. 20. That is, 22 of the 24 grinding surfaces fall into three areas of the graph: (1) the basin metate plot, (2) on the boundary between the basin metates and the mortars plots, and (3) outside the basin metate and the mortar plots. Only two combination-feature mortars (nos. 18, 36) fall within the mortar plot.

Overall, the combination-feature mortars fall to the upper right of the basin metates in the graph. In this regard, they conform to the relative configuration of mortar orifices in being more nearly equidimensional than the metates. Two basin metates (nos. 3, 65) provide the exception in that they lie among the mortars and outside both primary ranges.

Questionable (possible natural) bedrock features. Fourteen depressions in the LA 68182 bedrock outcrops could be natural, or they could be eroded cultural features. If natural, they appear to be anomalous because of their relative rarity and the absence of a ready explanation as to how they would have been formed under natural conditions. Of the 14 questionable features, 6 are in limestone, and 8 are in pebble conglomerate.

The questionable features are all oval in shape. They range from 16 to 26 cm long, from 12 to 17 cm wide, and from 1 to 4.5 cm deep (Appendix A). Ratios of length to width to depth range from 16:12:1 to 6:4:1 (rounded).

One of the more interesting aspects of the questionable features is the tight clustering of points on the tri-coordinate graph (Fig. 21). They cluster entirely within the primary range of the basin metates, strengthening the argument that they could be eroded basin metates rather than natural features.

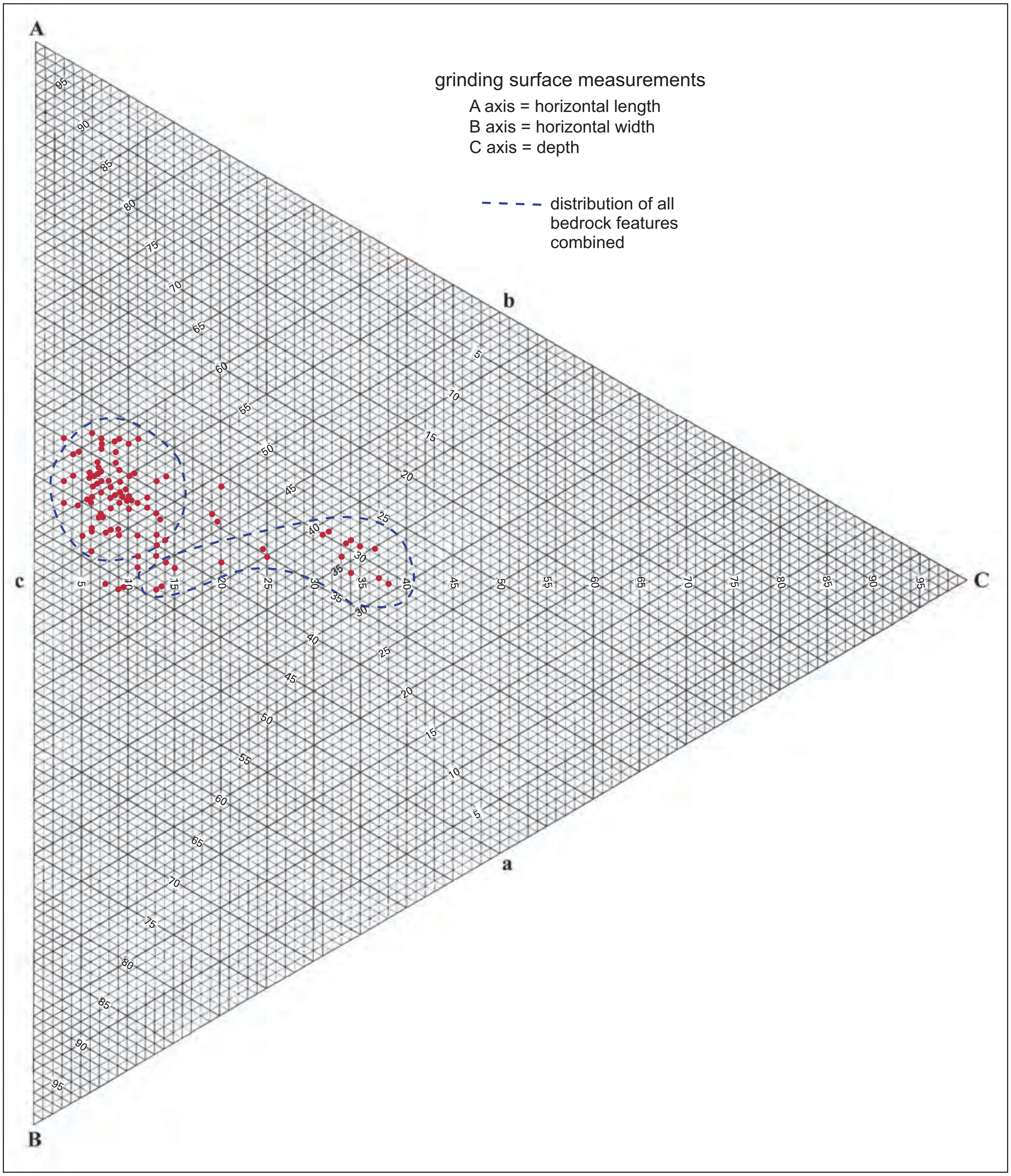

Figure 17. LA 68182: tripolar plot of all bedrock grinding features.

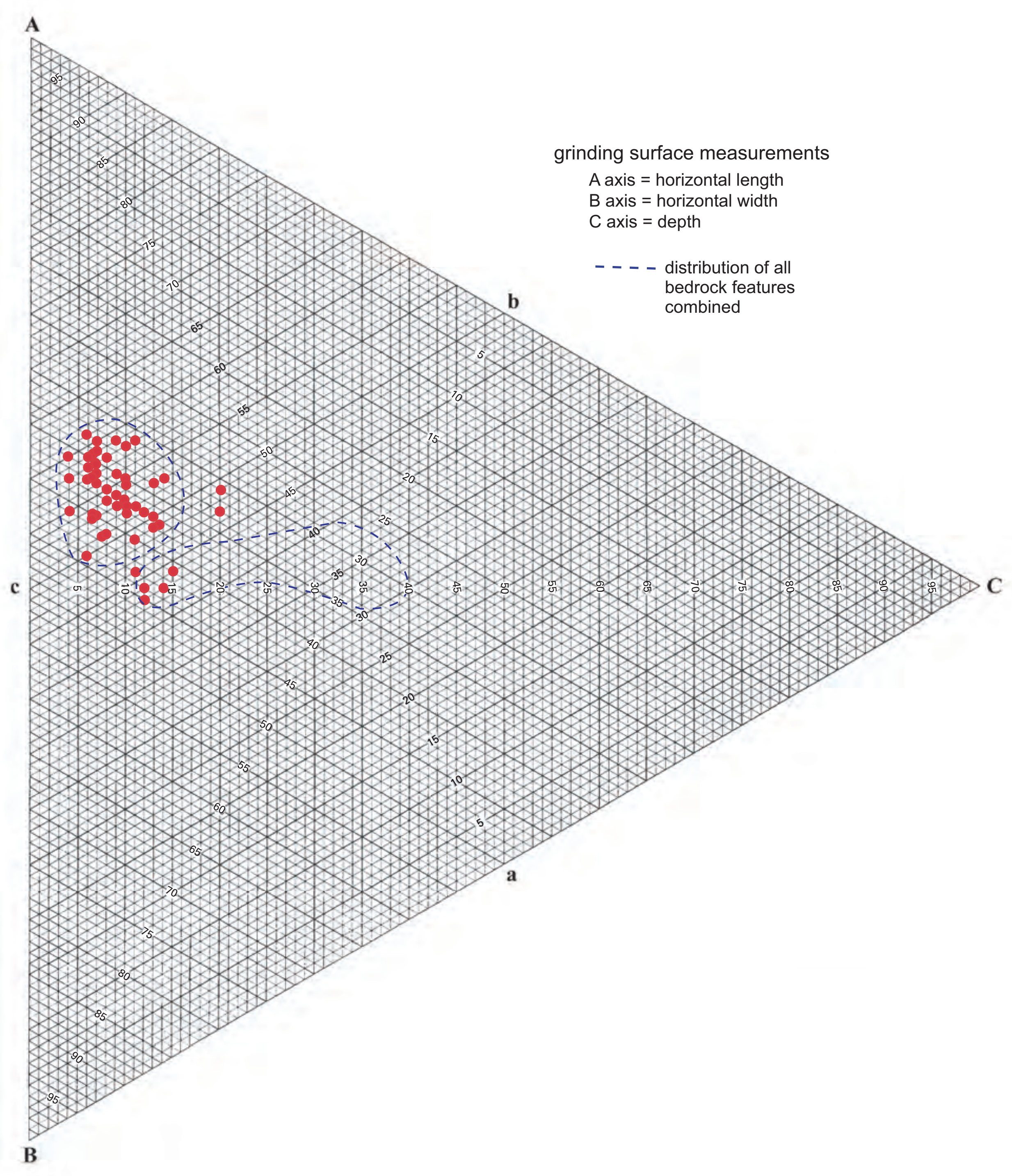

Figure 18. LA 68182: tripolar plot of single bedrock basin metates.

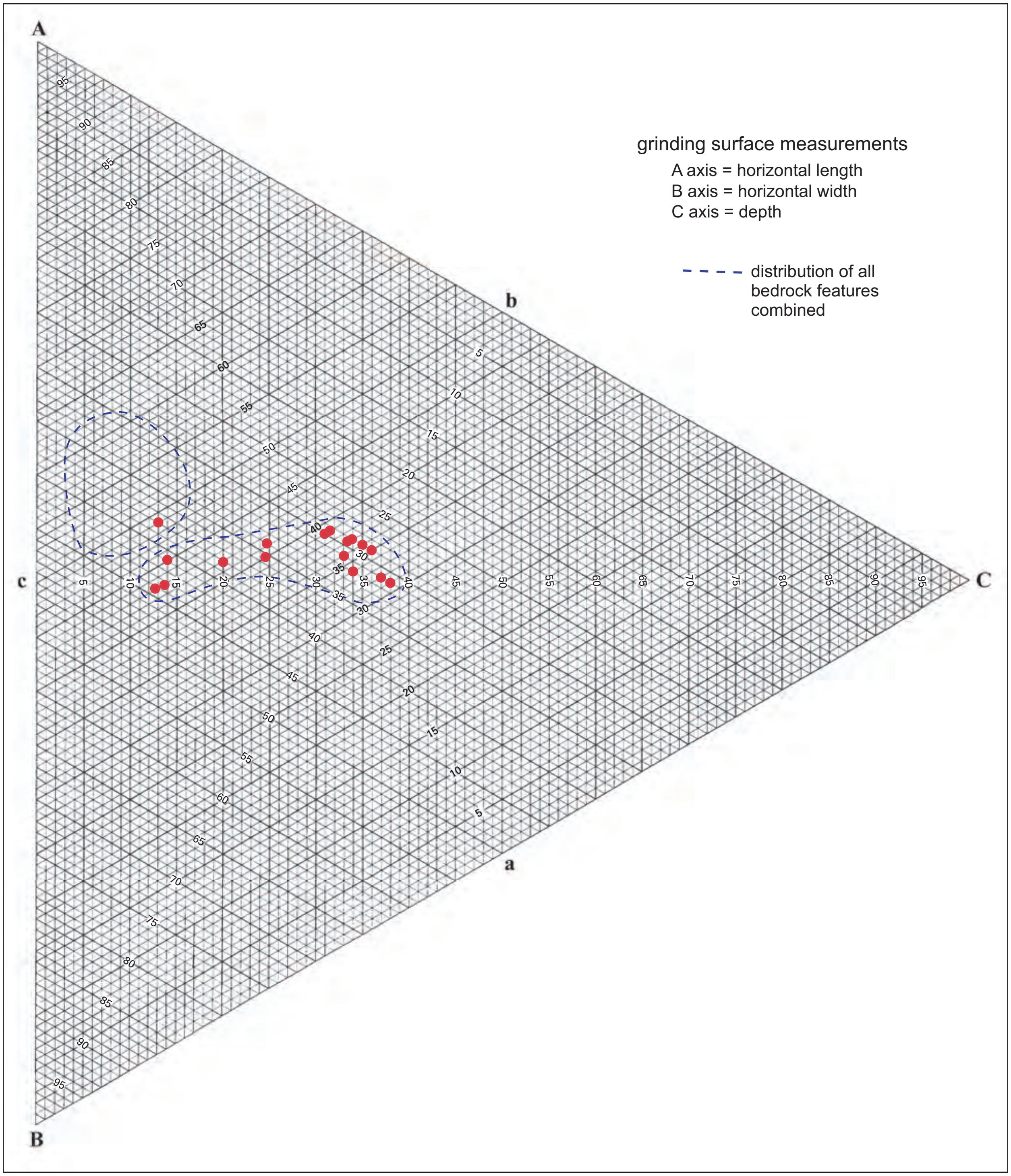

Figure 19. LA 68182: tripolar plot of single bedrock mortars.

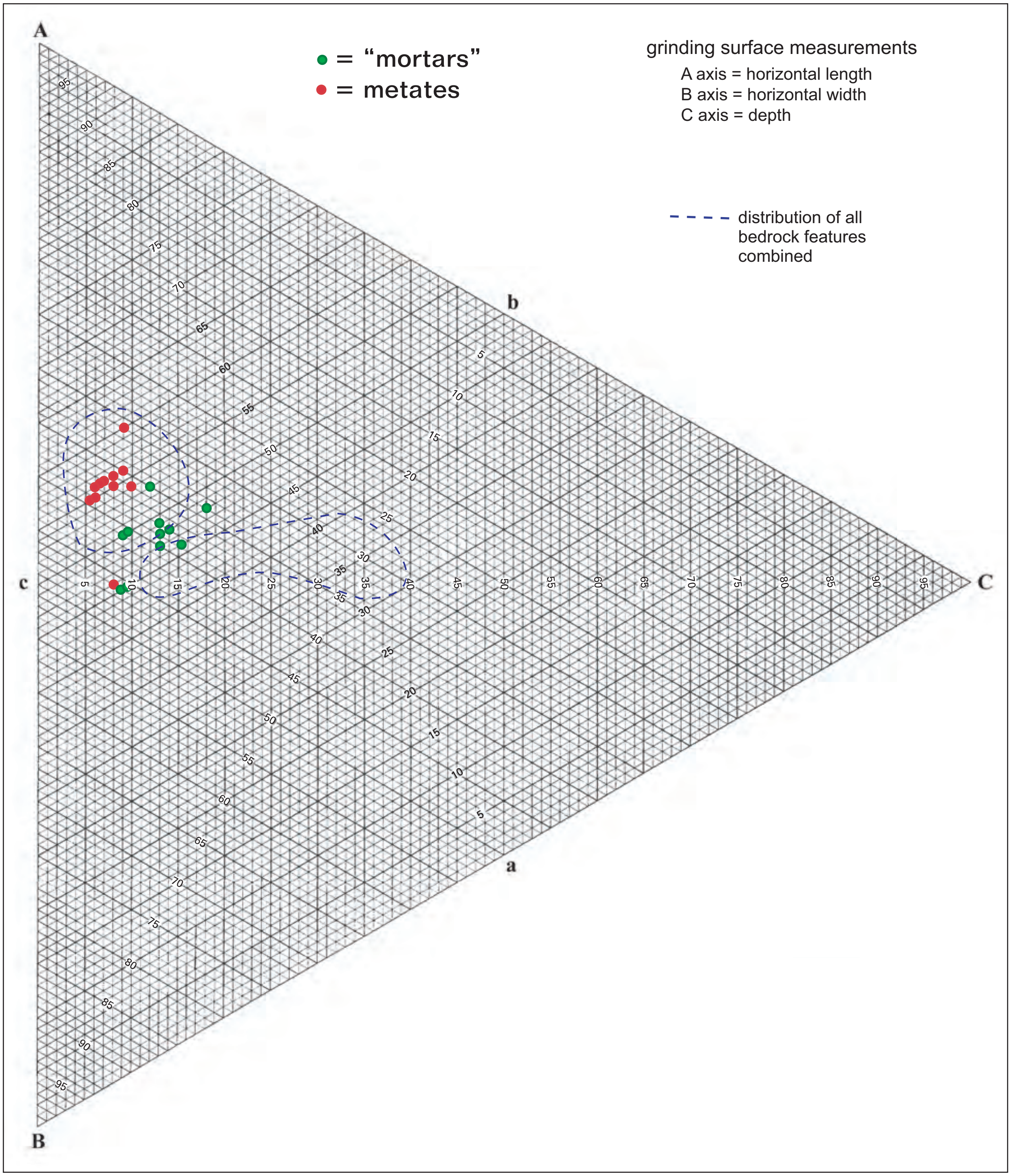

Figure 20. LA 68182: tripolar plot of combination bedrock features.

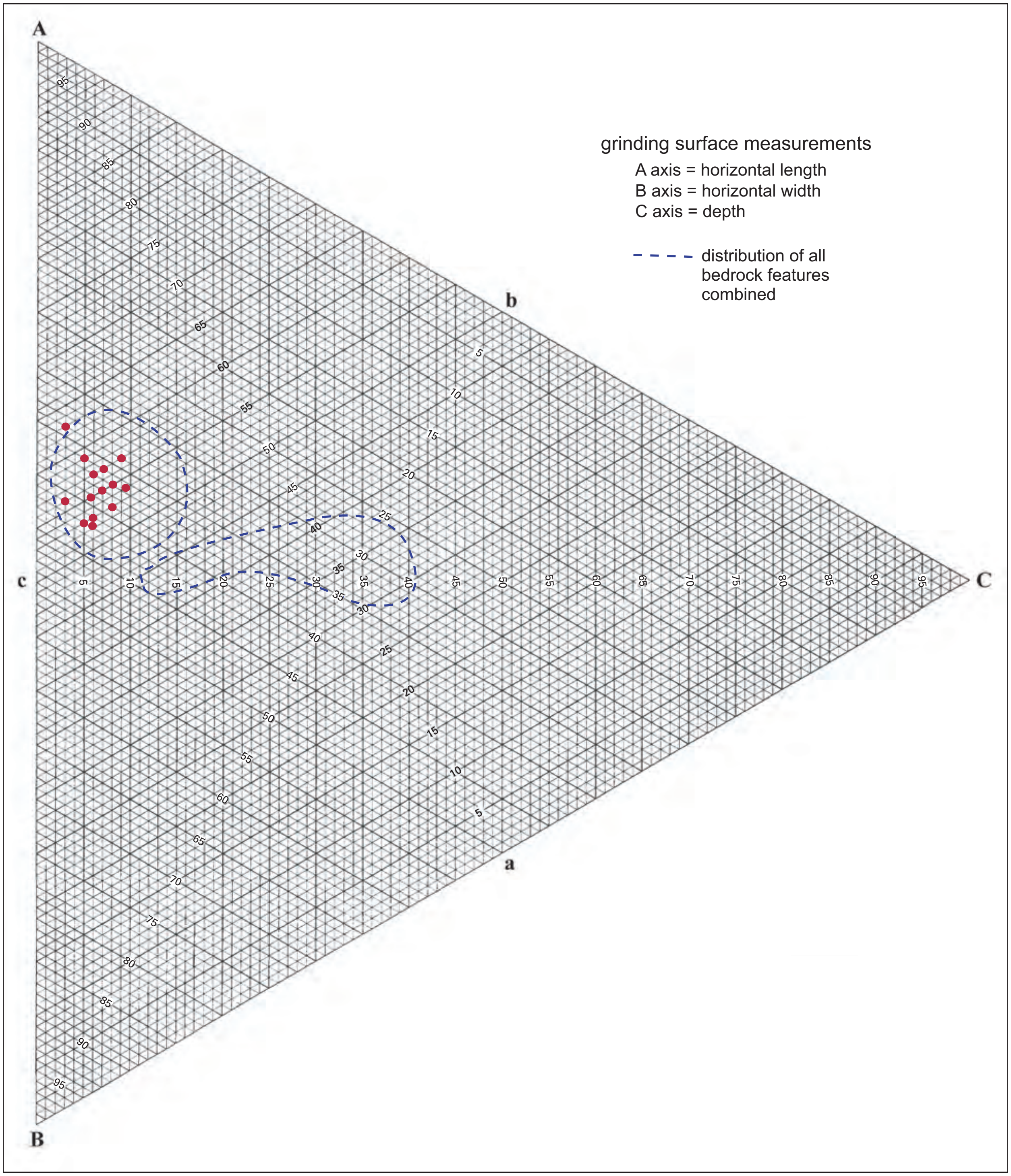

Figure 21. LA 68182: tripolar plot of questionable bedrock features.

Figure 22. LA 68182: hearth (Feature 1). (North arrow is 30 cm long.)

Hearth (Feature 1)

A small burned-rock hearth was situated on the north edge of the main cluster of BRF Group A (Fig. 22) at grid coordinate 46N 14W. It was composed of burned rocks arranged as a single circular layer. The dimensions were about 40 cm in diameter and 10 cm deep. Charcoal-blackened fill was among the stones and extended outside the perimeter of the hearth for several centimeters in all directions.

The cultural and temporal affiliations of this hearth are in question because of its position on the surface of the ground and its virtual superpositioning on the bedrock grinding features. In addition, the charcoal-stained fill extended well beyond the hearth limits. It is possible that the hearth, or campfire, belonged to a more recent event such as military war-games. Evidence of war-games, probably by the New Mexico Military Institute in Roswell, included several very old foxholes arrayed along the north "military crest" of the hill. In view of these uncertainties, the fill sample retrieved from this feature was not analyzed nor was charcoal obtained for dating.

Artifacts

Lithic manufacturing debris, pottery fragments, and several classes of formal and informal artifacts were recovered. The formal artifacts represent a variety of activities and include manos, portable metates, a portable mortar, a pestle, projectile points, projectile point preforms and roughouts, biface fragments, drills, hammerstones, bone awls, various types of stone scrapers, mussel-shell scrapers, knives, ornaments, and worked sherds. Informal tools include various flake tools such as scrapers, knives, and spokeshaves.

Throughout this report, artifacts are referred to by their FS (field specimen) numbers in order to facilitate access to individual items in the records and collections.

Philosophy of Artifact Terminology and Organization of Descriptions

The following descriptions and discussions have three fundamental, interrelated tenets. First, during the planning and production of a tool or artifacts, the individual had in mind either a specific tool for a specific function or a more generalized tool for multiple functions. These considerations are manifested in tool shapes and other characteristics. This is not to say that special-use tools did not, during their use-lives, serve more than one function, especially in impromptu situations. Most probably did. However, it was the *anticipated* function and needs that led to the design and labor investment in the finished product.

Projectile points are examples of common special tools. For reasons of aerodynamics and anticipated mode of use, their characteristics (size, shape, weight, and details of hafting elements) had to meet certain specifications. They were hafted onto arrows or atlatl darts and used to kill animals or human enemies. This did not necessarily preclude the occasional use of a hafted point for limited cutting or scraping chores as long as those tasks did not impose serious risk of breakage.

Secondary uses after the projectile point was broken were another matter. Broken points might, for example, have been used for impromptu cutting or scraping in the same way that many flakes became informal tools when they were picked up, used for scraping or cutting, and then were discarded. Importantly, such uses may or may not be distinguishable from secondary-use characteristics engendered while the artifact was hafted and still a viable projectile point tip.

General-purpose tools were made with the intention of serving two or more functional purposes. The functions were not necessarily related. Two examples of such a tool are the awl and the hammerstone. The awl might be used for hide-working and for basket-weaving. Hammerstones could be used to manufacture chipped stone and ground stone artifacts, and to renew or "resharpen" the grinding surfaces of manos and metates.

The second tenet is that, having identified tools and artifacts according to the principles just discussed, their descriptions are arranged in a fashion that facilitates discussions of activity types, site function, and settlement and subsistence practices. Thus, we use groupings such as "plant-processing artifacts," "ceremonial, ornamental, and/or recreational artifacts," and the like. This approach, taking its inspiration from Kelley (1984), provides the reader with an idea about artifact and function diversity at a glance.

The third tenet concerns many categories of bifaces and other genres that the author believes represent stages of manufacture rather than finished artifacts. For some reason, the items broke, were discarded, were lost, or otherwise became part of the archaeological record before being completed into tools. Thus, they are part of the debris created during manufacture and are described under the heading "Manufacture Debris" along with the descriptions of lithic debitage (flakes, cores, etc.).

Plant-Processing Artifacts

Manos. Fifteen complete and 22 fragmentary one-hand manos are in this artifact class. All are small cobbles that are modified only by the grinding surfaces (Fig. 23 and Appendix 2).

Limestone is the most common material (n=15, 41%), followed by sandstone (n=12, 32%), monzonite (n=8, 22%), purple quartzite (n=1, 3%), and fine siltite (n=1, 3%). The sandstones evidently represent more than one geologic source: two have a fine, white cement; one has small hematite grains that look like rust spots; one is a light gray material; and the rest (n=8) are a "generic" dirty sandstone of medium gray to gray brown color.

Specimens range from 80 to 163 mm long (mean=120 mm), 66 to 127 mm wide (mean=101 mm), 35 to 92 mm thick (mean=57 mm), and 425 to 1,917 g in weight (mean=1,072 g).

Ten specimens (27%) have two grinding surfaces each, and four others (11%) are too fragmentary to determine grinding-surface number. All of the rest (62%) have single grinding surfaces.

The grinding surfaces were monitored judgmentally for degree of curvature (flat, moderately curved, strongly curved) across the width axis. Strongly curved surfaces were essentially round, whereas moderately curved surfaces were definitely convex and fell roughly halfway between the flat and the round examples.

The grinding surfaces were also monitored judgmentally for degree of grinding development (slight, moderate, heavy). Slightly ground surfaces, because the manos are new, display some grinding wear, but the rock face is not altered from the natural shape of the cobble. Moderately ground surfaces of developed but not old manos have been altered over the entire grinding area; the natural curvature has been sufficiently altered to be obviously non-natural in contour, yet the artifact as a whole, especially the relative thickness, still has plenty of use-life. Heavily ground surfaces, denoting old manos, are totally altered from the natural state, and the edges of the surfaces are well defined all around the perimeters; the overall form of these items tends to be relatively thin, appears much used, and has little or no remaining use-life.

Tabulation of the curvature versus degree of grinding development suggests that overall morphology of the manos probably relates more to the original (natural) shape of the cobbles than to subsequent modification through grinding (Table 1). That is, flat grinding surfaces often display moderate and heavy wear. Moderately curved grinding surfaces are equally represented in the three development categories. Strongly curved surfaces display only slight to moderate grinding wear.

Portable metates. Seventeen fragments of portable or "travel" basin metates were recovered (Fig. 24). The term "travel" metate is sometimes used in regard to these artifacts because they are most often found at sites located far from suitable rock sources. They consist approximately evenly of two varieties: shaped and unshaped (Appendix 3). All items are so fragmentary that discussion of size and weight is not possible.

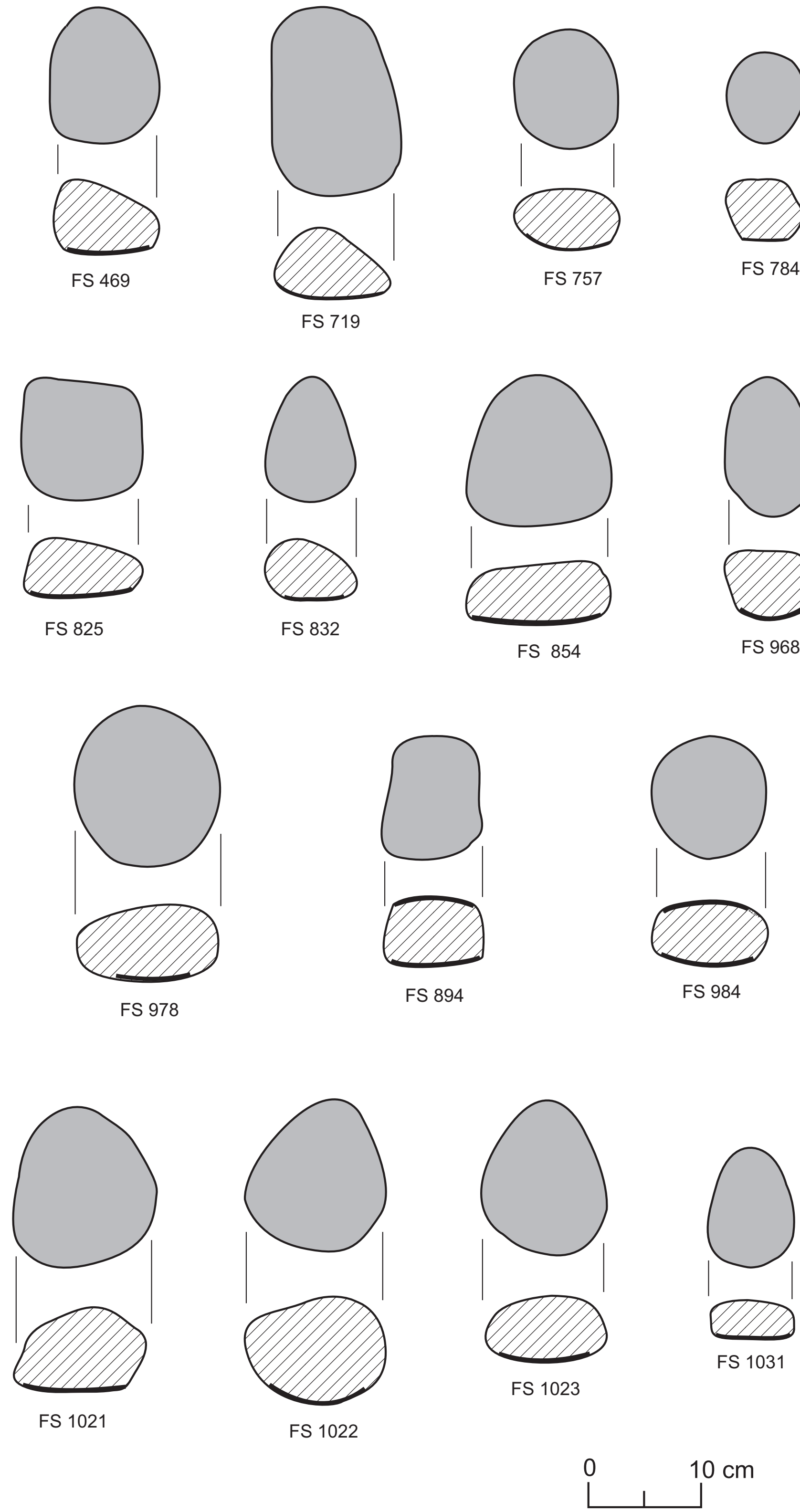

Figure 23. LA 68182: manos.

Table 1. LA 68182: degree of grinding surface development relative to curvature on manos.

	Degree of Grinding		
Surface Curvature	Slight	Moderate	Heavy
Flat	4	15	11
Moderate	5	4	4
Strong	1	3	-

Table total is 47, which represents 27 manos with single surfaces, and 10 manos with two surfaces.

The fragments of both the shaped and unshaped metates are strongly reminiscent of basin metates frequently recovered from the Roswell region in that all appear to have been small, thin, light-weight rocks that could have been transported easily over long distances. Thicknesses of the two varieties as a group range from 24 to 66 mm (mean=40 mm). Whether the edges were trimmed or left natural, the grinding surface tends to cover most, if not all, of one face. All of the LA 68182 specimens have single grinding surfaces.

A reasonably wide range of rock types and varieties are represented. Most are sandstone (n=14, 82%), though limestone (n=2, 12%) and possibly dacite (n=1, 6%) examples were also recovered. The 14 sandstone examples include the following colors and compositions: white (n=3), white with occasional dark grains (n=1), micaceous tan (n=2), micaceous red (n=1), micaceous "dirty" (n=1), "dirty" (n=1), limonitic tan (n=1), coarse hematitic red (n=1), light red (n=1), and medium red (n=2). Some of these varieties may be oxidation states of other varieties (especially the reddish ones), but the remaining variability is nevertheless remarkable and suggests a number of geologic sources.

There is little reason to suspect that the decision to shape a metate was anything but pragmatic. That is, if a rock of the desired size was found, then it was not shaped. Conversely, if the stone was much larger than needed for the grinding surface, then the edges might be trimmed by flaking or grinding, or both, to remove excess stone.

Thus, the overall thinness of the selected rocks, and the fact that the grinding surfaces cover most or all of the faces of the stones, indicate that small size and light weight were important considerations. The complete metates in several local collections support this conclusion.

Mano/metates. Two tabular artifacts (FS 422 and FS 724) have grinding surfaces on both faces, one of which is flat to slightly convex and the other concave (Fig. 24). These small fragments could be manos made from metate fragments, or small grinding palettes made from mano fragments, or dual-purpose artifacts used both as small manos and as small grinding palettes.

FS 422, found in square 20N 14W, is made of white sandstone with white cement and measures 62+ by 56+ by 27+ mm. FS 724, found in square 21N 18W, is made of white sandstone and measures 67+ by 62+ by 22+ mm (throughout this report the + symbol denotes an incomplete—i.e., broken—dimension of a fragmentary artifact).

Pestle. FS 1030 is a small cylindrical cobble with two heavily battered and ground ends (Fig. 24). The battering and grinding facets could be the result of use as a hammer, but the surface areas of both are of the approximate size and form expected for use as a pestle with the shallow bedrock mortars and the presumed mortar components of the combination bedrock grinding features. It would also be usable with the portable mortar described below. The pestle is made of limestone (possibly), measures 98 by 74 by 59 mm, and comes from Level 3 of square 21N 14W.

Portable mortar. FS 783 is a quarter-fragment of a portable mortar made on a limestone cobble (Fig. 24). It measures 126 by 105 by 73 mm and has a grinding bowl 25 mm deep. By projecting the arc of the remaining section of the grinding-bowl edge, the orifice of the complete mortar can be estimated at 150 to 160 mm in diameter.

Hunting-Related Artifacts

Projectile points. The 76 projectile points recovered from LA 68182 represent the Paleoindian, Early Archaic, possibly Middle Archaic, Late Archaic, terminal Archaic, and late prehistoric periods. The late prehistoric (pottery) is the dominant period, and is represented by basally notched, corner-notched, and side-notched arrow points. Because the Paleoindian and Early Archaic points were scattered throughout the deposits with the more numerous pottery period remains, we believe that they represent pickups by later peoples, rather than in situ Paleoindian and Early Archaic occupations. The Late Archaic period is poorly represented at LA 68182; virtually all of the late style Archaic points have a neck width that falls within the range for terminal Archaic points.

Formal type names cannot be assigned with certainty to all points. Reflecting both the professional archaeological and the prehistoric cultural boundaries expressed in southeastern New Mexico, we draw on the descriptions and type names defined in Turner and Hester (1993) for Texas, MacNeish and Beckett (1987) for the Archaic Chihuahua Tradition of the Chihuahuan

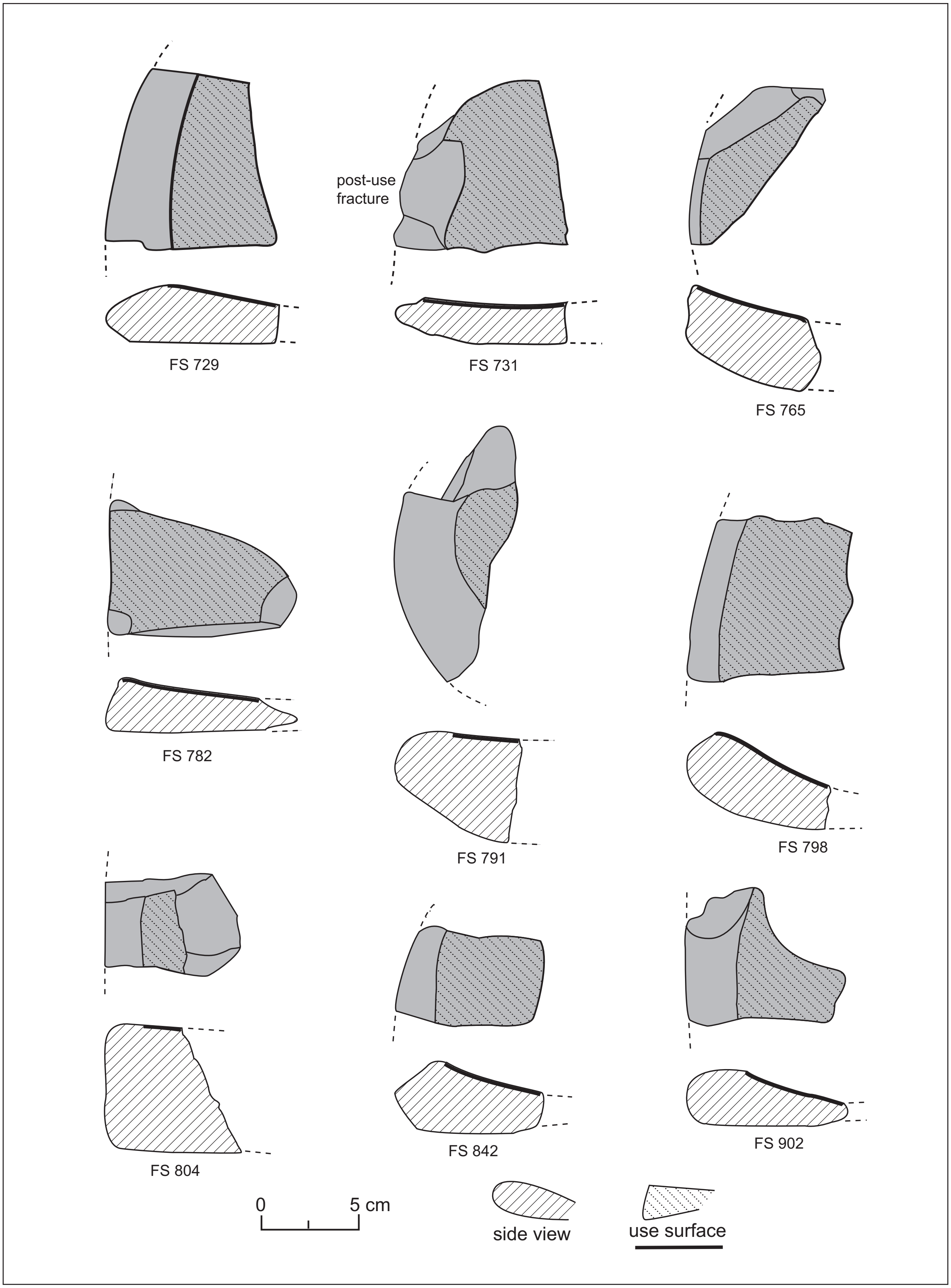

Figure 24. LA 68182: portable metates, mano/metates, pestle, and portable mortar fragments.

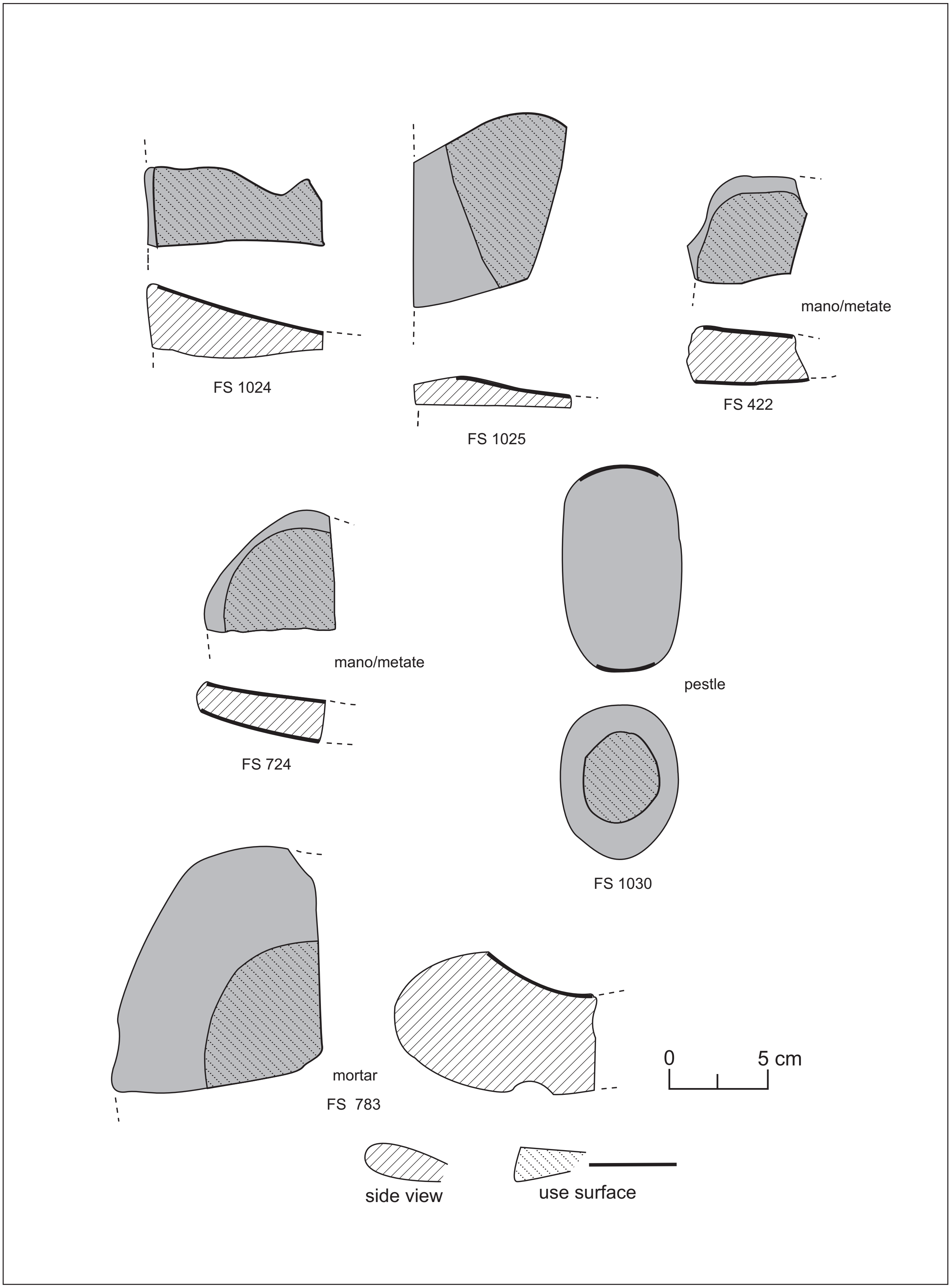

Figure 24 (continued). LA 68182: portable metates, mano/metates, pestle, and portable mortar fragments.

Desert, and Irwin-Williams (1973) for the Oshara Tradition of northwestern New Mexico.

For those points which cannot be comfortably assigned to a named type, we employ the Katzes' (1985a) metric neck-width criteria for assigning them to time periods. The groupings overlap, in part, but their basic validity and utility appear to be reliable. The Katzes' neck-width criteria are:

Arrow points (late prehistoric period)	9.0 mm or less
Early arrow points (transitional dart to arrow)	9.0 to 8.0 mm
Dart points (terminal Archaic period)	9.0 to 14.0 mm
Dart points (Late Archaic period)	13.0 to 16.0 mm

Two LA 68182 specimens, at 18 mm and 18.5 mm, fall outside the Katzes' range and presumably represent Middle Archaic points.

In the following paragraphs, the projectile points are discussed briefly by time period. Proveniences are not included here because the deposits were so disturbed as to be meaningless (proveniences can be found in Appendix 4).

PALEOINDIAN POINTS (n=4): The four basal fragments include one Clovis (FS 445), one possible Meserve/Dalton (FS 788), and two nonspecific Paleoindian-looking specimens (FS 325 and FS 367) (Fig. 25). All four are made from what appear to be regionally available tan, gray, or gray-brown cherts. The lower lateral edges of all four have been ground for hafting. The blade of FS 367 has been reworked.

EARLY ARCHAIC POINTS (n=2): The Early Archaic style is represented by one nearly complete Jay point (FS 989a) and one nonspecific, wide, basal fragment with an indented base and ground lower lateral edges. Both fragments display some reworking, and both are made of tan to gray-tan chert from the region.

POSSIBLE MIDDLE ARCHAIC POINTS (n=2): FS 436 and FS 982 are the bases of large Ellis-like dart points. Their neck widths are 18.5 and 18 mm, respectively. Since these values fall outside the upper range of Late Archaic neck widths from the Brantley area, we suggest that these specimens represent the Middle Archaic period. The blade section of FS 436 has been reworked. The lithic materials are fine-grained light gray quartzite and light brown-gray cherty siltite, respectively—materials that are unusual in the LA 68182 assemblage.

LATE ARCHAIC POINT (n=1): One projectile point falls within the Late Archaic neck-width range. FS 924 is broad, has shallow corner-notches with a neck width of 16 mm, and is made of a white and light orange chalcedonic chert.

LATE/TERMINAL ARCHAIC POINTS (n=4): In terms of neck width, four points fall within the overlap range (13 to 14 mm) between Late Archaic and terminal Archaic. Two are stemmed or basally notched, and two are corner-notched. FS 918 is typed as Hueco; the remaining three, which display evidence of serious reworking of the blades, are not typed. Materials include various white, tan, light gray, and gray-brown cherts, all evidently of regional origin. FS 98 appears to be heat-treated.

TERMINAL ARCHAIC POINTS (n=13): The terminal Archaic period is well represented, more so than any previous period. The 13 specimens include two basally notched or stemmed examples, nine corner-notched examples, and one side-notched example. Three are typed as Hueco or Hueco-like (FS 475, FS 992, FS 1016), one is Ellis-like (FS 850), and one is typed as Carlsbad (FS 1003). Four (FS 184, FS 459, FS 759, FS 969a) display varying degrees of reworking.

Seven are made of various tan, light gray, and gray-brown cherts presumed to be regionally available; one is made of fingerprint chert (FS 759). Two are made of light gray and brownish gray siltite or cherty siltites (FS 992, FS 1006), including one with fine brown to black speckles. One is gray and rose chalcedony (FS 744), and two are Tecovas lookalike cherts (FS 744, FS 792). The last (FS 320) is Alibates-like at first glance but does not appear to be either Alibates or one of the better known lookalikes such as those from near Tucumcari and Yeso. Thus, perhaps as much as 15% of the items (the two Tecovas lookalikes) could be made from imported materials. Three appear to be heat-treated (FS 475, FS 744, FS 1003).

EARLY CORNER-NOTCHED ARROW POINTS (TRANSITIONAL DART TO ARROW) (n=3): Three points have neck widths between 8 and 8.9 mm, the zone that Katz and Katz (1985a) believe signifies the transition from dart to arrow point technology. Although the points in this category are supposed to be corner-notched, the notches on all three of the LA 68182 specimens are somewhat ambiguous—one typologist would call them corner-notched whereas another would call them side-notched.

The one attribute that unites all three points is that the blades are short and relatively wide. The materials are the various shades of light and medium gray to gray-brown regionally available cherts. FS 985b also has orange spots that suggest heat treatment.

CORNER-NOTCHED ARROW POINTS (n=30): Corner-notched arrow points constitute the dominant projectile point style and period at LA 68182, but they are not a homogeneous group in terms of size or substyle. Some are long and relatively narrow, whereas others are short and comparatively wide. Blade shapes are highly variable. Accordingly, we have not attempted to assign type names to this group.

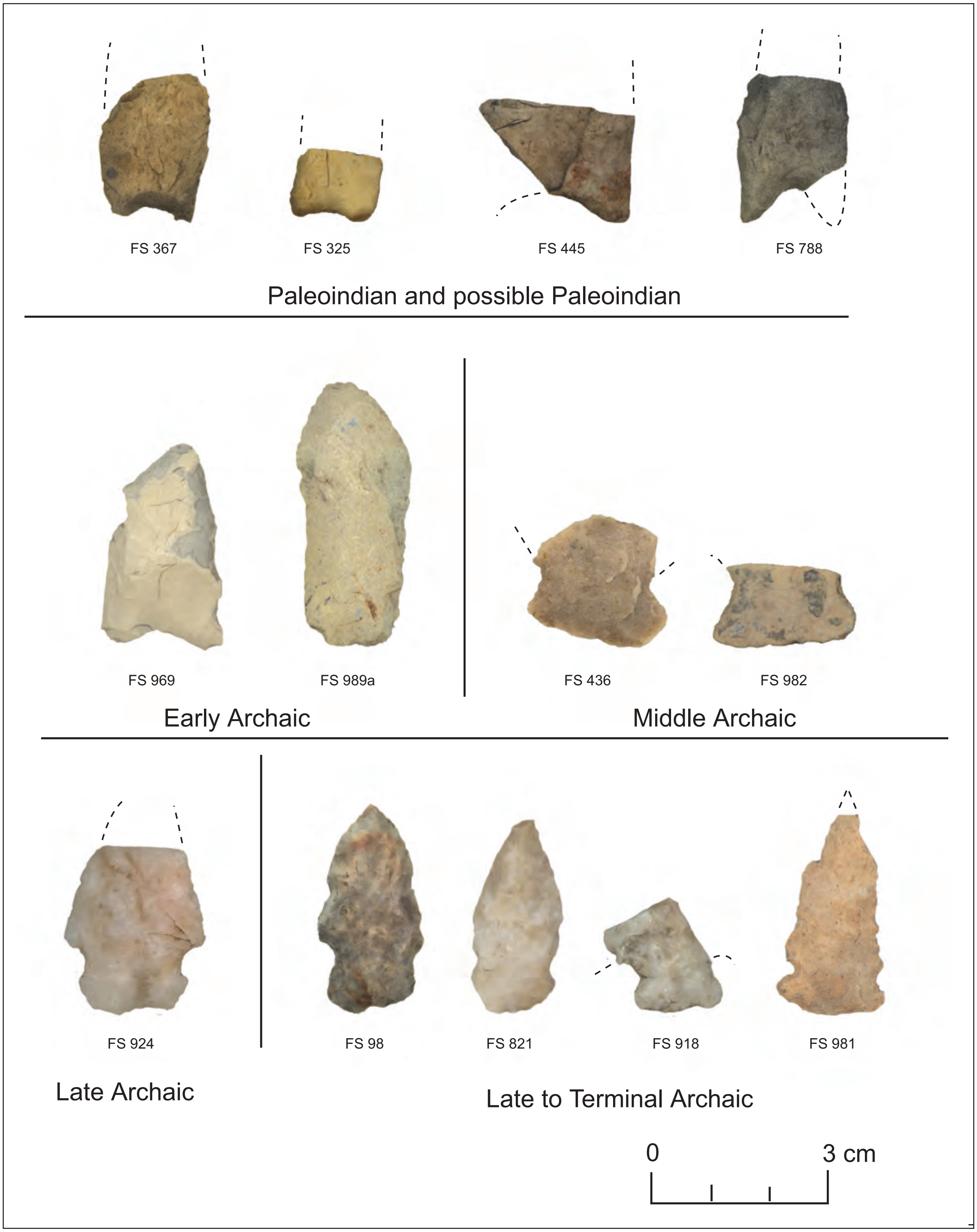

Figure 25. LA 68182: projectile points.

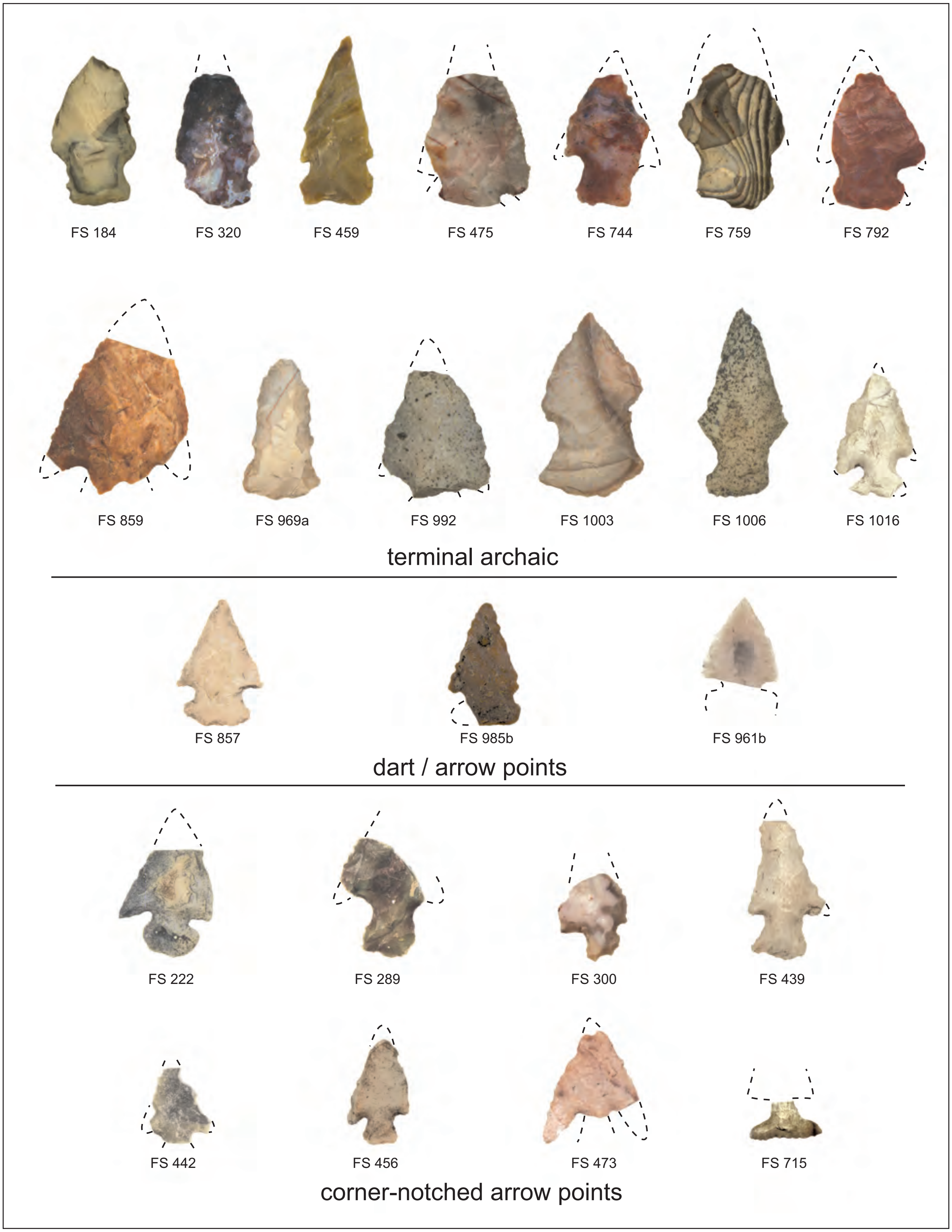

Figure 25 (continued). LA 68182: projectile points.

Figure 25 (continued). LA 68182: projectile points.

The material types are equally diverse. Regionally available white and tan to gray and gray-brown cherts dominate (n=21). One of these (FS 919) is chalcedonic. Three (FS 289, FS 895, FS 919) of these 21 appear to be heat-treated. Other materials include orange-rose chert (FS 473), white-speckled, light to dark gray chert (FS 816), clear gray chalcedony (FS 880), white and yellow chalcedony (FS 918), medium and dark gray cherty siltite (FS 896), hazy gray obsidian (FS 131), Alibates (FS 756), an Alibates lookalike chert (FS 1056), and Tecovas chert (FS 969b). Only three points (FS 289, FS 895, FS 1056) appear to be heat-treated.

The Alibates, Alibates lookalike, Tecovas, and obsidian points are imported materials which together comprise 13% of the assemblage.

SIDE-NOTCHED ARROW POINTS (n=17): Side-notched arrow points are only half as numerous as corner-notched points. Most fit the general characteristics of Harrell points (n=11). Two can be classed as Washita points (FS 838, FS 875), one of which (FS 838) has a basal notch. Two are atypical (FS 87b, FS 892), and two others are too fragmentary to assign to type (FS 789, FS 818). No Garza or Toyah points are present.

The material types are diverse. Regionally available white and tan to gray and gray-brown cherts dominate (n=9). One of these is light gray and orange chalcedonic chert (FS 962). Only two of the nine appear to be heat-treated (FS 892, FS 962). Other materials include light to medium gray-brown chert with yellow streaks and spots (FS 739, FS 744), medium gray chert with brown streaks (FS 865), clear chalcedony (FS 87a), chalcedonic Alibates lookalike chert (FS 765; blade edges finely serrated), possible Edwards chert (FS 995; finely flaked), and red and black chert (FS 838). The red and black chert is strongly reminiscent of a reputed variety of Tecovas chert observed by the author to be common at the Harrison Greenbelt site (41DY17) in Donley County of the Texas Panhandle. None of the individually listed materials appears to be heat-treated.

If we accept the red and black chert as Tecovas chert, and consider the possible Edwards chert and the Alibates lookalike example, then 6% and perhaps as much as 18% of the side-notched arrow points are made of imported materials.

Possible beveled knife (n=1). FS 875 is a tip fragment of what could be a beveled knife with bifacial sharpening on both edges, suggesting that it might represent the final solution for an essentially worn-out tool. The transverse cross-section has an elongate diamond shape (Fig. 26) that is reminiscent of, but deviates from, the classic beveled knife. It is made of a light to medium gray chert that is not Edwards chert. The dimensions are 19+ by 15+ by 6 mm; it was found in Level 2 of square 23N 21W. Beveled or Harahey knives are typical of the bison-hunting late prehistoric Plains groups of Texas, Oklahoma, Kansas, and Nebraska (Turner and Hester 1993; O'Brien 1984).

Manufacturing Tools

The primary function of artifacts in this category is generally believed to be the manufacture of other kinds of tools.

Awl (n=1). One tip of a bone awl is the only example of this artifact class. It originated as a bone splinter from a large-mammal long bone which was then totally shaped by grinding and polishing to a fine point. Its preservation is evidently due to its having been burned, almost calcined, but it is not certain whether this was intentional or accidental. The item measures 18+ by 8 by 4.5 mm and comes from Level 6 of square 21N 10W.

Drills (n=4). The four drill fragments consist of two proximal ends, one distal end, and one section of shank (Fig. 26). The proximal end of FS 681 is minimally shaped. FS 925 is fully modified and may have originally been destined to be a projectile point. None of these items displays use-wear on any of their edges.

The materials (no imported materials are present), dimensions, and proveniences are as follows:

- FS 319: off-white and medium gray-brown chert; 15+ by 7+ by 3.5 mm; surface of square 34N 10W.
- FS 681: off-white and medium gray-brown chert; 31+ by 22 by 6 mm; surface of square 62N 50W.
- FS 909: purple quartzite; 24+ by 10+ by 4.5 mm; Level 4 of square 19N 14W.
- FS 925: light brown and gray chert; 32+ by 17+ by 5 mm; Level 2 of square 23N 5W.

Flake tools (n=167). Flake tools are flakes of various sizes and shapes that have one or more edges displaying use-wear, intentional retouch, or both (see Fig. 26). This class of artifact includes items with both microwear and retouch (i.e., require a microscope for study) and macroretouch. Aside from the use-wear/retouch, these flakes are not otherwise modified or shaped.

In archaeological reporting, items with microscopic use-wear or retouch are usually called "utilized flakes" or "informal tools." Those with macroscopic evidence are usually treated as formal tools and described individually as "side scrapers," "knives," and the like, even if the retouch is restricted to the edge.

Because of the problems associated with demonstrating or inferring functions for specific wear and retouch phenomena, we assume that flake tools were used for various cutting and scraping activities.

Flake tools are typed according to several descriptive attributes. The primary focus is on the individual edges bearing use-wear or intentional retouch. The sorting criteria are:

- type: unifaces, bifaces, unifaces/bifaces (both on same edge), notches, and projections (graver and burin-like tools). A possible fletching tool consists of a graver point in the bottom of a large notch.

- manifestation type: use-wear, intentional retouch, or combination.

- edge configuration: straight, convex, concave, sinuous, irregular, serrated.

The LA 68182 flake tools number 167 items with a total of 215 individual edges (Table 2). Number of edges per flake varies as follows: one edge, n=124, 74% of flake tools; two edges, n=33, 20% of flake tools; three edges, n=9, 5% of flake tools; four edges, n=1, 1% of flake tools. Unifacial edges predominate (n=186, 87% of edges), followed by notches (n=15, 7% of edges), bifacial edges (n=10, 5% of edges), unifacial/bifacial edges (n=3, 1% of edges), and possible fletching tools (n=1, <1% of edges). Use-worn edges (n=173, 80% of edges) are the most common, followed by intentionally retouched edges (n=35, 16% of edges), and combination use-worn/intentionally retouched edges (n=7, 3% of edges).

Local gray cherts dominate (n=131, 78% of flake tools), followed closely by other cherts (n=22, 13% of flake tools), chalcedonies (n=5, 3% of flake tools), other materials (n=5, 3% of flake tools), and siltites/quartzites (n=4, 2% of flake tools; note that FS 443a is made of Alibates material; Fig. 26).

The 167 flake tools constitute 1.3% of the sample of lithic debitage (cores, flakes, etc.; n=13,026) from LA 68182. As an artifact class, the flake tools are distributed fairly evenly throughout the deposits in the crevice.

Hammerstones (n=4). Only four hammerstones were recovered from the surface and excavations at LA 68182, which is surprising considering the large number of projectile points, grinding stones (both portable and nonportable), and the chipped lithic manufacture debris (flakes, cores, roughouts, bifaces, etc.). The original exterior surfaces of all four hammerstones have been modified (probably unintentionally) to greater or lesser degrees by loss of flakes during use.

FS 727 is a nearly spherical piece of limestone that has most of its ridges battered from use. It measures 62 by 58 by 51 mm, weighs 236 g, and comes from Level 3 of square 21N 18W.

FS 769 is a broken limestone cobble with four battered points. It measures 86 by 78 by 58 mm, weighs 554 g, and comes from Level 6 of square 20N 12W.

FS 970 is a small, rounded-cylindrical cobble of purple quartzite that is battered mainly on the ends. It measures 80 by 64 by 62 mm, weighs 335 g, and comes from Level 1 of square 19N 15W.

FS 980 is a small, tabular-oval cobble of brownish purple quartzite that is battered mainly on four points. It measures 90 by 78 by 48 mm, weighs 427 g, and comes from Level 5 of square 19N 16W.

Table 2. LA 68182: flake-tool edge types by use/retouch type.

	Use-wear	Intentional Retouch	Combination Use-Wear and Intentional Retouch	Total
Unifacial				
straight	61	14	1	76
convex	41	5	-	46
concave	34	2	-	36
sinuous	1	-	1	2
irregular	15	10	1	26
Bifacial				
straight	4	3	-	7
convex	2	1	-	3
Unifacial and bifacial (same edge)				
straight	-	-	2	2
concave	-	-	1	1
Notch	14	-	1	15
Possible fletching tool	1	-	-	1
Total	173	35	7	215

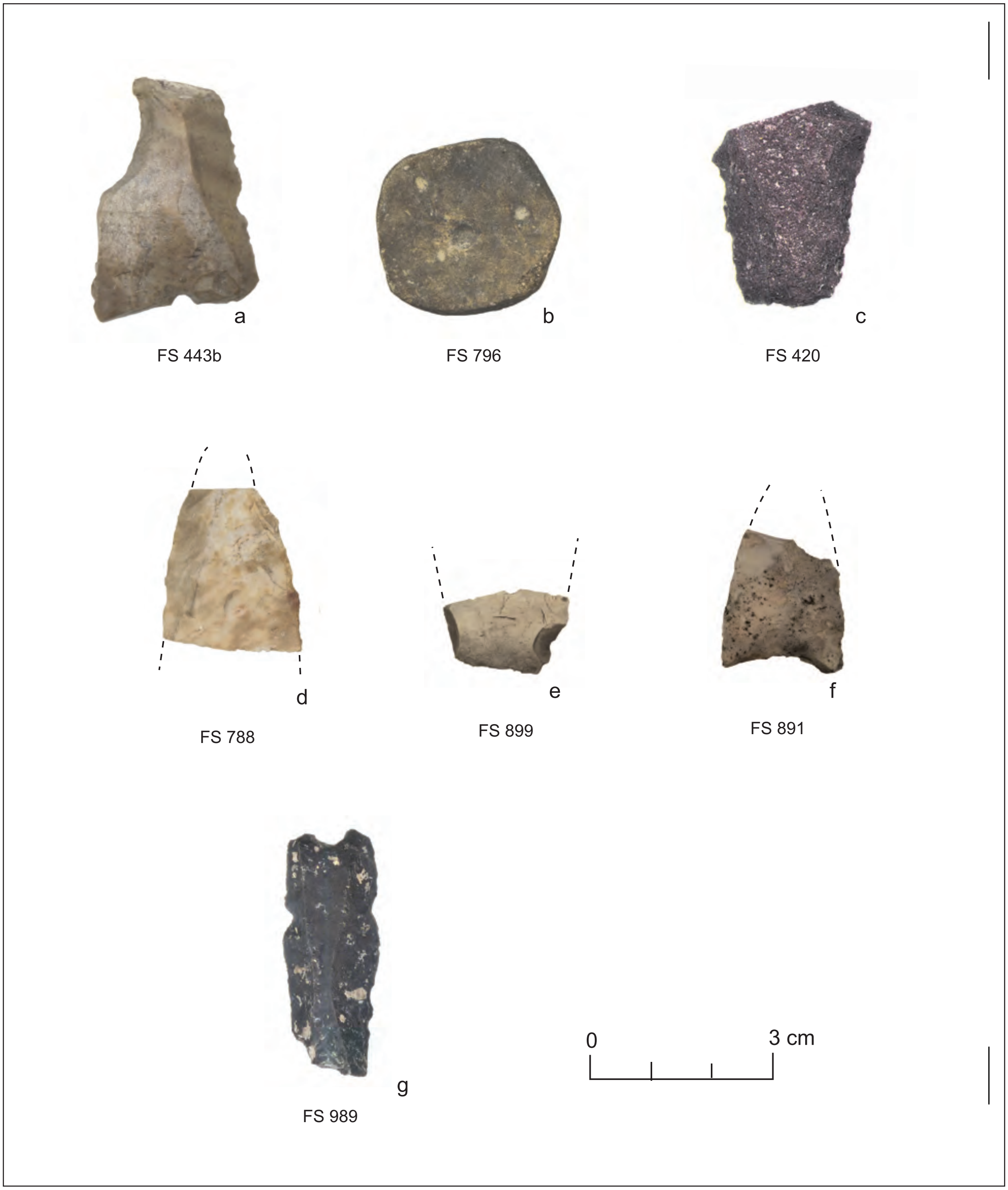

Figure 26. LA 68182: other artifacts—(a) spokeshave, (b) worked sherd, (c-f) special bifaces, (g) ornament.

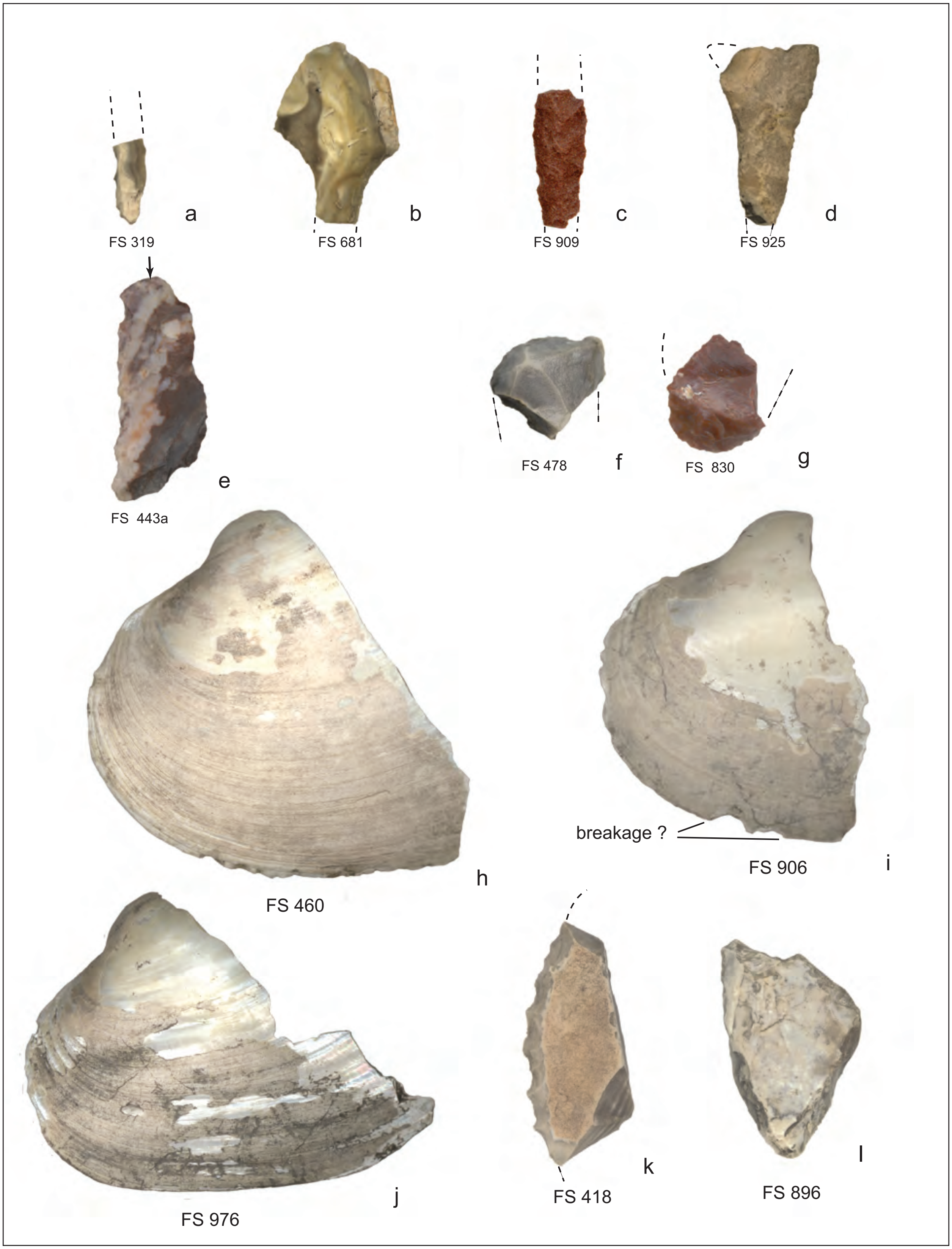

Figure 26 (continued). LA 68182: other artifacts—(a-d) drills, (e) Alibates flake knife, (f, g) end-scrapers, (h-j) general scrapers of mussel shell, (k, l) scrapers.

Scrapers (n=8). This category includes all unifacially flaked specimens that appear to represent finished, functioning tools regardless of whether the edges display use-wear (see Fig. 26). This approach is used to segregate these items from other unifacial items that do not appear to be tools.

General scrapers include items that are technically side-scrapers and end-scrapers in that the scraping edges are situated on the respective landmark positions (lateral and distal edges) of flakes. However, it is clear from the lack of formalized shaping and finishing of the artifacts (other than the scraping edges) that the toolmakers were simply taking advantage of the shape, length, and other characteristics of the available edges, regardless of where those edges were on the flakes. Thus, use of position terms in these instances is of no particular value and is avoided here.

In contrast, the term "end-scraper" is restricted to those formalized scrapers that typify the late prehistoric/historic bison-hunting cultures of the Plains. These scrapers are more or less standardized in shape (teardrop), have the scraping edge on the true distal end of the flake or blade-flake, and usually have one or both lateral edges trimmed to create the shape. The proximal or platform end of the flake or blade-flake is also the proximal end of the scraper. Quite often, the toolmaker selected flakes for an arch-like curvature in the ventral surface that resulted when the flake was removed from the core. This curvature, being located next to the distal edge, gave the edge added strength and leverage during scraping activities. Although sizes can vary widely, it appears that most of these end-scrapers were probably hafted, accounting for the standardization of the shapes.

Scrapers are made of two materials: siliceous stone and freshwater mussel shell. Although the materials on which they were used may have been the same, in whole or in part, they are described separately by material for convenience.

END-SCRAPERS (n=2): FS 478, the distal fragment of a classic Plains-style end-scraper, was partly reworked subsequent to breaking. Part of the broken edge was rechipped to form a new, convex scraping edge. It is made of medium gray chert (not Edwards), measures 18+ by 21+ by 8 mm, and comes from Level 2 of square 22N 19W.

FS 830 is a small fragment that may or may not be from an end-scraper. It is made of a rose and red Alibates lookalike chert, measures 21+ by 18+ by 8+ mm, and comes from Level 4 of square 21N 9W.

GENERAL SCRAPERS OF MUSSEL SHELL (n=3): Three right valves of *Cyrtonaias tampicoensis* [Lea] have been modified by reducing the size of the umbo to facilitate the handgrip and by removing the thinner edge of the shells to isolate the strong edge that performs the task. Several dozen of these artifacts were recovered from the Fox Place (LA 68188). The manufacturing steps and various end products are described in detail and illustrated in that report (Wiseman 2002).

FS 460 was prepared in the "U-delt" pattern, meaning that after the diagonal break was made, the resulting point along the distal edge was then also snapped off in order to remove the last small section of thin shell edge. The working edge subsequently developed jagged use-wear, presumably from use on a substance or substances that were nearly as hard as the shell. The length of use-wear is 47 mm. Overall artifact dimensions are 66 by 67 mm; it weighs 30.6 g, and the provenience is Level 2 of square 20N 4W.

FS 906 was prepared in the "U-dels" pattern, which differs from the "U-delt" pattern in that most of the point along the distal edge was removed. The working edge developed jagged use-wear, presumably from use on a substance or substances that were nearly as hard as the shell. The length of use-wear is 47 mm. Overall artifact dimensions are 57 by 49 mm; it weighs 13.9 g, and the provenience is Level 2 of square 19N 14W.

FS 976 was prepared in the "U-del" pattern, which differs from the "U-delt" pattern in that the residual point on the edge was not removed. The working edge subsequently developed smooth use-wear that cross-cut the growth rings of the shell and changed the configuration of the edge. The edge was presumably modified by use on relatively soft substances. The length of use-wear is 50 mm. Overall artifact dimensions are 53 by 70 mm; it weighs 14.6 g, and the provenience is Level 3 of square 19N 16W.

GENERAL SCRAPERS OF STONE (n=2): FS 418 is a piece of tabular fingerprint chert with at least one edge unifacially serrated for use as a scraper. It has cortex on one face, and the other face is a patinated fracture plane. Overall artifact dimensions are 43+ by 19+ by 8 mm, and the provenience is the surface of square 4S 35W.

FS 896 is a "side-struck" flake (a flake that is wider than it is long) with unifacially retouched distal and lateral edges. The material is speckled light to medium gray local chert. It measures 40 by 25 by 5.5 mm, weighs 8.8 g, and comes from Level 6 of square 23N 23W.

SPOKESHAVE (n=1): FS 443b is a flake with two small notches, one on the distal end and the other on a lateral edge (see Fig. 26). The first notch measures 4 mm across and 1.5 mm deep, the other 4 mm across and 1 mm deep. The remainder of the notched lateral edge unifacially use-worn for its entire length. Except for these features, the rest of the flake is unmodified. The material is speckled and mottled light to medium gray-brown chert. The flake measures 40 by 28 by 7.5 mm and weighs 6.9 g. The provenience is Level 2 of square 24N 20W.

Ornamental Artifacts

The one ornament recovered from LA 68182 is a black chert flake with no modification other than three small notches—one in the distal edge and one each on the nearby lateral edges (FS 899; see Fig. 26). Presumably, the lateral notches facilitated suspension, but this is only a guess. The item is vaguely reminiscent of an anthropomorph or a zoomorph. It is complete, measures 41 by 16 by 4 mm, weighs 3.5 g, and comes from Level 1 of square 24N 22W.

Miscellaneous Artifacts

Unifaces (n=3; not shown). Three unifacial items do not seem to be finished artifacts as such. We suspect that they represent pieces used for knapping practice or some other nontool function. Edge angles are 40 to 75 degrees.

FS 451 is made of coarse tan, light gray, and medium gray-brown chert. It measures 33 by 30 by 10 mm, weighs 10.5 g, and comes from Level 1 of square 20N 21W.

FS 466 is made of mottled tan, light gray, medium gray, and dark gray chert. It measures 28 by 23 by 9 mm, weighs 5.5 g, and comes from Level 1 of square 24N 3W.

FS 1008 is made of coarse, medium and dark gray chert. It measures 43 by 21 by 11 mm, weighs 8.5 g, and comes from Level 3 of square 24N 26W.

Worked sherd (n=1). FS 796 was edge-ground into a roughly circular shape, and a central perforation was started on the interior surface but not drilled completely through (see Fig. 26). It is made of South Pecos Brown, measures 30 by 28 by 5.5 mm, weighs 6.9 g, and comes from Level 6 of square 21N 10W.

Manufacturing Debris

Debris from the manufacture of tools and other cultural items constitutes the majority of cultural materials recovered from the site. As is typical, the vast majority of debris is from chipped stone manufacture. However, debris from making ground stone and items of shell is also present, though in much smaller quantities.

As stated in the opening paragraphs of the preceding section, some of the items in this section would appear with the descriptions of the formal, finished artifacts in the more traditional archaeological reports. But because the author believes that many, if not most, even all, generalized bifaces, mano preforms, etc. represent interrupted (though not necessarily unplanned) and now de facto terminated steps during manufacture, they are more properly described in this section. By taking this course, we get a better idea of how much tool manufacturing was taking place at the site versus the other daily tasks involving the formal, finished artifacts.

Ground Stone

Two fragments of ground stone may be preforms for grinding implements. If they were not modified for eventual use in plant-food processing, then their intended function remains unknown.

FS 822 may be a mano preform. It is a small, subrectangular piece of dirty sandstone that was edge-ground to shape. Neither surface is use-worn. The dimensions are 87+ by 91 by 37 mm, and its provenience is Level 7 of square 21N 10W.

FS 1026 may be a fragment of a metate preform. That is, this piece of tabular white sandstone with occasional dark grains has one ground edge but no use-wear or other modification to either face. The dimensions are 82+ by 93+ by 21+ mm, and its provenience is Level 4 of square 23N 24W.

Shell

Four small pieces of freshwater mussel display evidence of manufacture for ornaments and possibly for tools. Three small fragments (unidentifiable to species, but probably not *Cyrtonaias tampicoensis*) may have been intended for beads or small pendants. They were recovered from Level 2 of 20N 4W, Level 3 of 20N 13W, and Level 5 of 23N 23W.

The fourth piece, a right valve of *Cyrtonaias tampicoensis*, is from a young animal and is much smaller than the valves usually employed as tools. However, it has the upper-left-to-lower-right fracture through the umbo that usually characterizes valves used as tools. The reason for this fracture in this particular case is uncertain, unless perhaps the toolmaker was desperate for tool material. No use-wear is evident on the edge.

Chipped Stone

Roughouts (early-stage bifaces) (n=62). Sixty-two roughly shaped, percussion-flaked bifaces were recovered from throughout the site (Fig. 27 and Appendix 5). They represent the initial stages of projectile point manufacture, and their sizes and shapes probably reflect for the most part the sizes and shapes of the original material units from which they were made. In many cases, the original material units were probably not much larger than the roughouts. Because only four of the LA 68182

Figure 27. LA 68182: roughouts (early-stage bifaces).

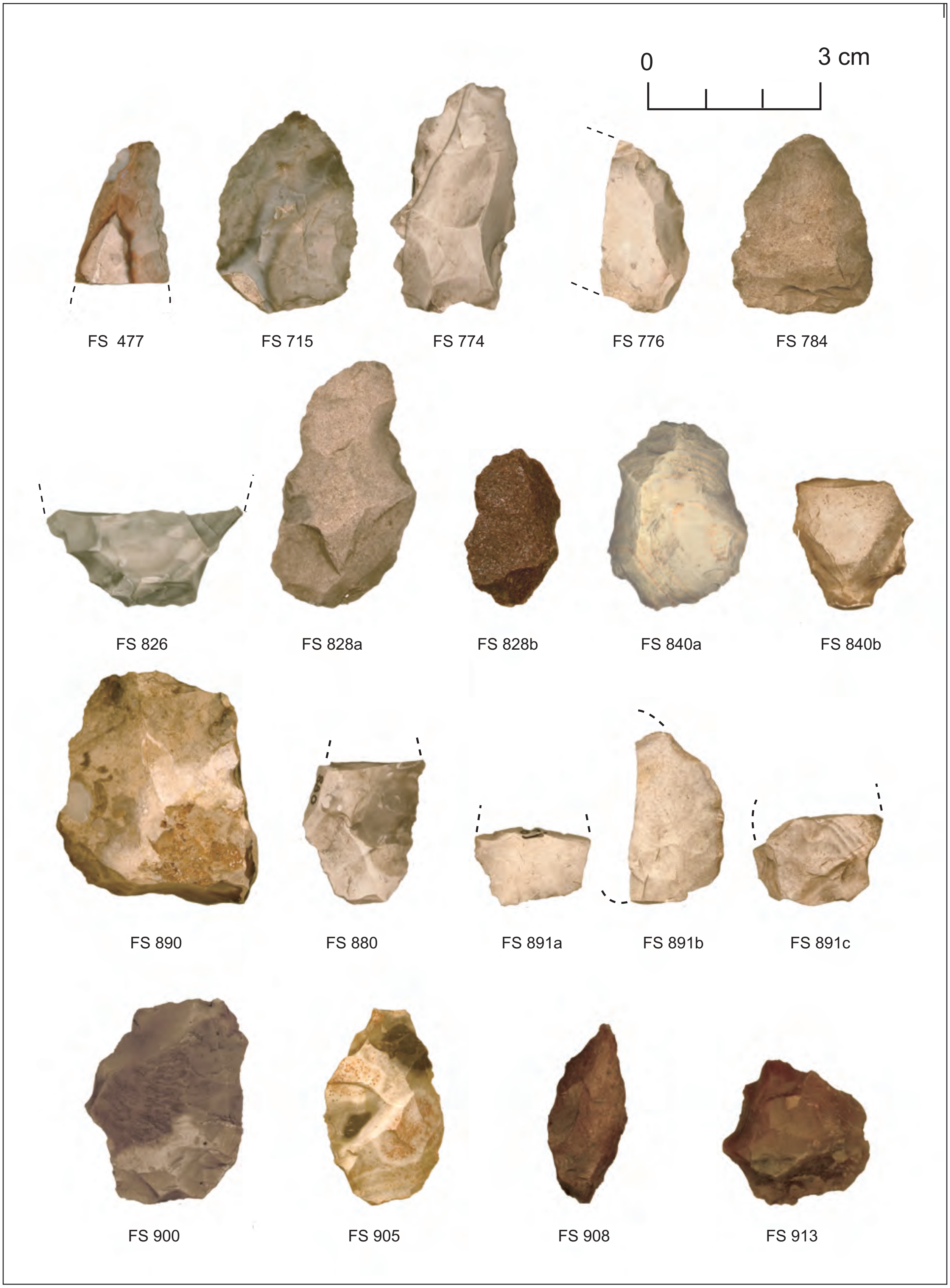

Figure 27 (continued). LA 68182: roughouts (early-stage bifaces).

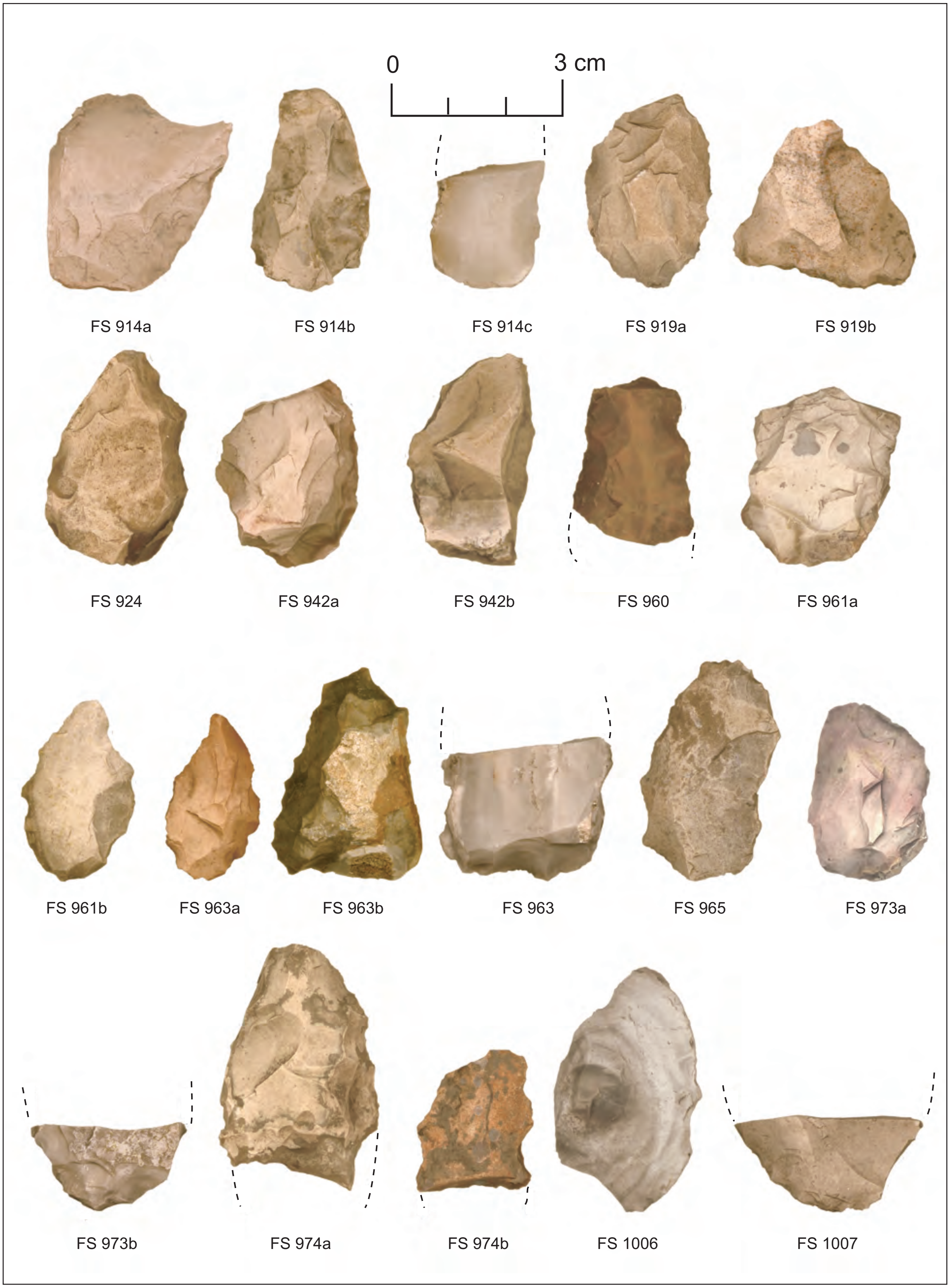

Figure 27 (continued). LA 68182: roughouts (early-stage bifaces).

specimens were clearly made from flakes, most were probably made from the small cherty concretions that abound in the San Andres outcrops of the Roswell area.

The primary materials are various shades and color combinations of white and gray cherts from local outcrops of the San Andres Formation (n=57, 92%). Eight of these (13%) are the distinctive variety known as fingerprint or zebra chert. Other materials include white and rose and white varieties of chalcedony (FS 427e and FS 914c, 3%), purple quartzite (FS 828b, 2%), possible amygdaloidal basalt (FS 247, 2%), and a gray chert that could be Edwards chert (FS 963c, 2%). Because the possible Edwards flake gave only a warm response under long-wave ultraviolet light, however, we consider the piece to be of probable local or regional origin. Thus, no imported materials are present in this assemblage.

The sizes and weights of specimens in the roughout assemblage vary considerably. Complete specimens (n=39) average 33.5 mm long (range 20 to 49 mm), 22.9 mm wide (range 13 to 37 mm), 9.8 mm thick (range 6 to 14 mm), and 7.6 g in weight (range 2.5 to 23.0 g).

Projectile point preforms (late-stage bifaces) (n=27). Twenty-seven small, finely flaked bifaces are mostly, if not entirely, late-stage bifaces intended for completion into projectile points (Fig. 28 and Appendix 6). Most were probably broken or lost during final thinning, but a least a couple were broken during notching. Some are probably dart preforms, but most are small enough to be arrow preforms.

The primary materials are various shades and color combinations of white and gray cherts from local outcrops of the San Andres formation (n=23, 85%). Other materials include yellow chert (FS 427, 4%), liver-colored fine quartzite (FS 987, 4%), Alibates chert (or "agatized dolomite"; FS 1054, 4%), and a Tecovas lookalike chert (FS 744, 4%). Imported and possibly imported materials (Alibates and Tecovas lookalike, respectively) account for perhaps as much as 8% of these preforms.

Preform size and weight vary considerably. Complete specimens (n=7) average 26.7 mm long (range 22 to 34 mm), 14.7 mm wide (range 11 to 19 mm), 4.5 mm thick (range 2.5 to 6 mm), and 1.8 g in weight (range 0.9 to 2.9 g).

Special biface fragments (n=4). Four fragments of bifaces have not been classified in any of the above categories. Although they do not appear to be finished artifacts or tools, they differ sufficiently from all other non-projectile-point bifaces to merit separate description (see Fig. 26). All materials are presumably of local or regional geologic origin.

FS 420 has a square base and expanding lateral edges. It could be an Early Archaic projectile point preform, although the edges of the base and the lower lateral edges are not ground. Dimensions are 34+ by 26+ by 8.5+ mm; material is purple quartzite; provenience is the surface of square 50N 57W.

FS 788 is a blade mid-section of a long, leaf-shaped biface. Dimensions are 27+ by 23+ by 6.5+ mm; material is light and medium brown chert, probably heat-treated; provenience is Level 3 of square 20N 11W.

FS 891 is a basal fragment similar to FS 420 above. Like that specimen, this one also lacks basal grinding. Dimensions are 14+ by 20+ by 4.5+ mm; material is light tan and gray chert; provenience is Level 1 of square 23N 23W.

FS 989 is relatively large, triangular, and has an indented base. The distal end was partly reworked and then rebroken. The basal edges lack grinding, and the piece is too thin to reduce further; thus, it is not a Paleoindian point or preform. Dimensions are 23+ by 20 by 4 mm; material is light to medium gray chert; provenience is Level 1 of square 23N 23W.

Miscellaneous biface fragments (n=74). A large number of biface fragments are so small that their assignment to one of the above categories (projectile points and preforms) would be arguable. Best guesses as to what they are can be found in the remarks given in Appendix 7. They are discussed here in terms of fragment type: base, blade, blade mid-section, lateral edge, tip, and unknown/uncertain.

Eight basal fragments represent three basic materials: local/regional gray cherts (n=6), local/regional siltites (n=1), and Alibates chert ("agatized dolomite"; n=1). Five are, or are possibly, heat-treated. Probably all of these fragments represent breakage during manufacture.

Seven blade fragments involve only local/regional gray cherts. None are heat-treated. These fragments probably represent both manufacture breakage and use breakage, because possible preforms, darts, and arrows are present.

Nineteen blade mid-section fragments are present. These differ from blade fragments in that they represent smaller portions of the blades. All materials are local/regional gray cherts. Four are, or are possibly, heat-treated. Almost all of these items probably represent breakage during use, because most appear to be from either darts or arrows.

Seven lateral-edge fragments represent two basic materials: local/regional gray cherts (n=6) and cloudy, light gray obsidian (n=1). Three are, or are possibly, heat-treated. Some of these items are the result of use-breakage.

Tips are the most common fragments (n=31). Most are of local/regional gray cherts (n=25), but local/regional chalcedonies (n=2), local/regional siltites

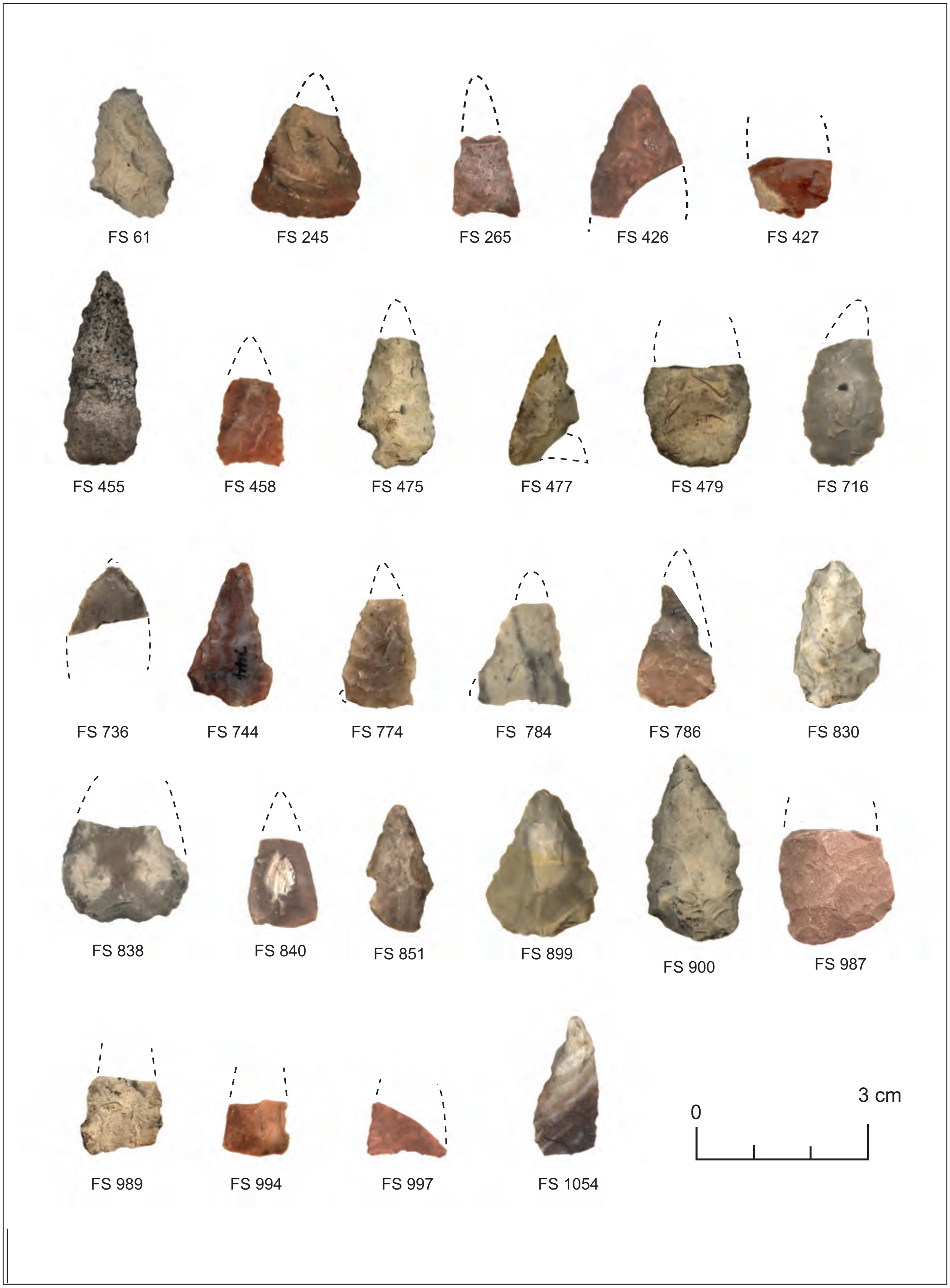

Figure 28. LA 68182: projectile point preforms (late-stage bifaces).

(n=2), Alibates chert (N=1), and an Alibates lookalike chert (n=1) are also present. Only five are, or appear to be, heat-treated. Breakage appears to be due equally to both manufacturing and use.

To summarize the material types in the Miscellaneous Biface Fragments category, only two pieces of Alibates chert ("agatized dolomite"), one piece of a presumably nonregional Alibates lookalike material, and one piece of obsidian are present. Together, they represent 5% of the materials. No Edwards chert or suspected Edwards chert is present.

Lithic Debitage

Lithic manufacture debris—cores, flakes, shatter, and pieces of material—constitutes the bulk of the lithic materials recovered from LA 68182 (Table 3). The analysis of these materials, following the standard analysis used by the author in the Roswell region over the past 20 years, focuses on reconstructing the lithic technology and identifying materials and sources. The raw materials and definitions used to classify and analyze chipped lithic debris are described in Appendix 8. The local gray chert sourcing study is described in Wiseman 2000a and Wiseman 2002.

Table 3. LA 68182: summary of lithic manufacture debris.

Manufacture Debris Category	Number	Percent
Cores	267	2.0%
Single platform	60	0.5%
Two platforms adjacent	44	0.3%
Two platforms parallel	13	0.1%
Three platforms	16	0.1%
Tested cobble/pebble	14	0.1%
Flake core	115	0.9%
Indeterminate	5	<0.1%
Flakes	10,699	82.1%
Core reduction	9880	75.8%
Decortication	137	1.1%
Platform rejuvenation (from side)	6	<0.1%
Biface thinning	40	0.3%
Potlid	100	0.8%
Hammerstone	2	<0.1%
Indeterminate	534	4.1%
Shatter	2044	15.7%
Pieces of material*	16	0.1%
Total	13,026	100.0%

*Unworked raw material units brought into the site by humans.

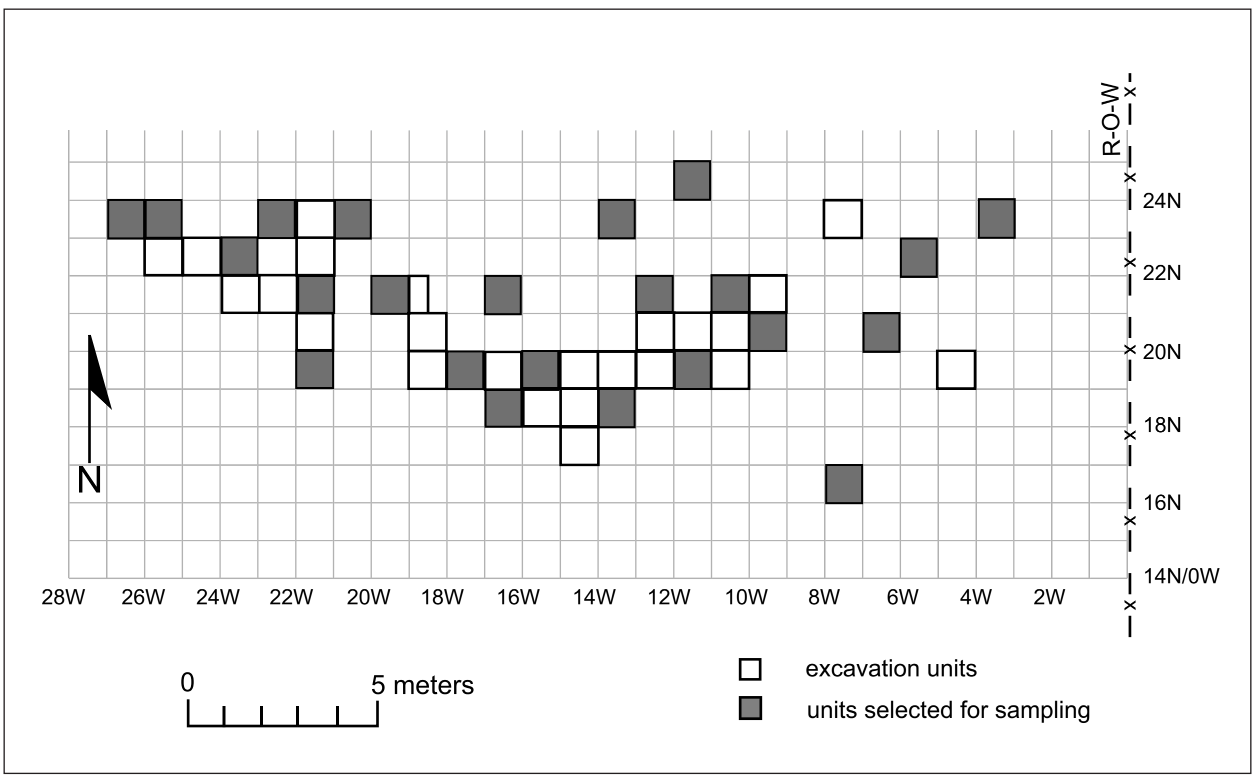

Figure 29. LA 68182: excavated squares selected as full-analysis proveniences for chipped stone lithic debitage and brown ware pottery.

Table 4. LA 68182: summary observations on certain lithic debitage classes.

	Cores		Flakes: Core Reduction		Flakes: Biface Thinning		Flakes: Other		Shatter and Other		Site Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Materials												
local chert	198	74.2%	6435	65.1%	25	62.5%	540	69.3%	1596	77.5%	8794	67.5%
other chert	45	16.9%	1930	19.5%	10	25.0%	138	17.7%	263	12.8%	2386	18.3%
chalcedonies	8	3.0%	453	4.6%	4	10.0%	61	7.8%	97	4.7%	623	4.8%
limestones	-	-	10	0.1%	-	-	-	-	-	-	10	0.1%
siltites/quartzites	5	1.9%	616	6.2%	-	-	24	3.1%	70	3.4%	715	5.5%
other	11	4.1%	436	4.4%	1	2.5%	16	2.1%	34	1.7%	498	3.8%
total	267	100.0%	9880	100.0%	40	100.0%	779	100.0%	2060	100.0%	13026	100.0%
Heat-treated												
no	194	72.7%	7241	73.3%	19	47.5%	430	55.2%	1200	58.3%	9084	69.7%
yes	25	9.4%	752	7.6%	8	20.0%	83	10.7%	209	10.1%	1077	8.3%
possibly	2	0.7%	513	5.2%	1	2.5%	111	14.2%	265	12.9%	892	6.8%
indeterminate	46	17.2%	1374	13.9%	12	30.0%	155	19.9%	386	18.7%	1973	15.1%
totals	267	100.0%	9880	100.0%	40	100.0%	779	100.0%	2060	100.0%	13026	100.0%

Approximately 38,000 pieces of lithic manufacture debris were recovered from the site surface and excavations. A 40% sample was chosen for full analysis. The sample consists of all debitage from a series of squares selected on a judgmental basis (Fig. 29). The selection criterion was to obtain a visual representation of the length and width of the excavations, adding squares to the sample until the number of items reached 40% of the combined total for the site. The only caveat was to avoid squares 20N 12W and 20N 13W, which contained the human interment.

The cores, core-reduction flakes, biface-thinning flakes, and exotic materials of the analysis sample are described below. Pieces of debitage bearing use-wear or intentional retouch are described in the section on tools.

Cores (n=267). The 267 cores include six subtypes and one residual category (see Table 3). The flake core is the most common, followed by single-platform and two-platforms-adjacent cores. Materials are varied but are dominated by local gray chert (Table 4).

Sizes vary greatly, but the mean sizes of all core types are remarkably similar (Table 5). This fact negates a scenario of linear progression from large and simple to small and complex cores.

Correlation statistics of core size and weight (Table 6) indicate fairly high standardization of core dimensions for all cores as a group. Single-platform and two-platforms-adjacent cores show the highest standardization for all pairings of dimensions. Two-platforms-parallel cores also have high correlations except for the unusual fact that the thickness–length and thickness–width correlations are quite low (in the .6000s). The correlations for three-platform cores and flake-cores are also quite low overall (lower than this author has seen in some time). The three-platform core values might reflect the small sample size. The same cannot be said for the flake cores, which constitute the largest class of cores (n=100) in the assemblage.

Given the probability that standardizations of dimensions may in part be imposed by the natural geometry of the pieces of material, correlation coefficients in the .8000s and .9000s are considered potentially significant from a cultural standpoint, whereas those in the .7000s and .6000s are considered to be potentially less so. We should also not overlook the probability that the knappers were selecting for the blockier (as opposed to more tabular) pieces of material in the first place.

Only 9.4% of the cores showed evidence of intentional heat treatment. With another 0.7% of possibly heat-treated specimens, the total may be slightly over 10%. These figures are slightly lower than those for the core-reduction flakes and less still than those for the lithic assemblage as a whole. It might be noted, however, that the percentage of definitely heat-treated cores is actually higher than the percentage of definitely heat-treated core-reduction flakes and for the assemblage as a whole. The difference is in the percentages of possible heat-treated examples.

Core-reduction flakes (n=9,880). Approximately half (n=4,468) of the 9,880 core-reduction flakes are complete. Summary statistics (Table 7) indicate that, on average, they are quite small and very light (1 to 2 g). A 1-tailed Pearson correlation matrix (Table 7) indicates that the flake dimensions are not strongly correlated, except for the correlation between weight and thickness, which is in the .6000s. We feel that this clearly indicates a general lack of standardization of flake shapes, even though the actual statistics assign a 2-tailed significance of .001 to all correlations. Our judgement is based on the fact that, in other studies, the values are higher overall.

Other characteristics of the core-reduction flakes include the following (Table 8, and see Table 4). The primary materials are local cherts, with other cherts a distant second place. Heat-treatment was rarely used—the total positive and possible cases total less than 13%. Single flake-scar platforms are the most common, accounting for nearly half of the flakes. Just over half of the flakes have feathered or modified feathered terminations, but nearly 44% are hinged or stepped. The dorsal cortex profile is virtually classic: more than 60% of the complete flakes lack dorsal cortex, and each successive category has fewer members.

Biface-thinning flakes (n=40). As in other debitage categories, local cherts are the predominant material, although other cherts and chalcedonies are more prevalent than in the other debitage categories. In addition, a higher percentage of biface-thinning flakes are heat-treated (at 20%, approximately double that of other categories).

Exotic lithic materials (n=4). Materials originating from sources outside southeastern New Mexico are rare in the LA 68182 debitage assemblage. Of the four pieces identified, three are of clear black obsidian (possibly from the Jemez source in north-central New Mexico), and one could be Alibates. All four are quite small flake fragments (weights of 0.3, 1.7, 0.1, and 0.1 g). The specimen weighing 0.3 g is a biface-thinning flake; all others are core-reduction flakes. Their proveniences are widely scattered both horizontally and vertically.

Gray cherts (n=6,526). The gray chert flakes in the analysis sample from LA 68182 were subjected to the bulk debitage UV analysis described in Wiseman 2000a and 2002. This analysis characterizes what are presumed to be local materials according to their response to stimulation by ultraviolet light. The purpose of this study, to be applied to as many site assemblages as possible over the next few years, is to explore the possibility that subregional varieties can be found within the San Andres gray cherts. If found, variation could be useful in discovering and elucidating intraregional human movement (as in seasonal rounds), or chert exchange patterns, or both.

Table 5. LA 98182: summary of complete core dimensions.

Core Type	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
All cores (n=252)				
mean	33.12	25.85	15.25	20.83
SD	10.95	9.96	7.47	47.62
range	98.0	83.0	54.0	594.8
Single platform (n=59)				
mean	33.75	25.85	30.57	17.49
SD	13.99	12.96	8.28	80.19
range	86.0	79.0	50.0	592.7
Two platforms adjacent (n=44)				
mean	36.66	30.09	19.59	33.98
SD	12.38	11.77	9.11	56.35
range	63.0	53.0	47.0	299.1
Two platforms parallel (n=13)				
mean	29.54	24.77	16.62	15.45
SD	7.43	8.11	6.59	13.06
range	25.0	27.0	26.0	40.4
Three platforms (n=16)				
mean	31.44	25.31	18.94	17.12
SD	7.58	5.76	6.89	15.19
range	26.0	22.0	24.0	51.2
Flake (n=100)				
mean	32.95	24.92	11.99	11.53
SD	8.12	6.68	3.77	9.81
range	44.0	35.0	19.0	59.2

Table 6. LA 68182: correlation matrix of core dimensions.[1]

Core Type	Length	Width	Thickness	Weight
All cores (n=252)				
length	1.0000			
width	.8646	1.0000		
thickness	.7219	.7827	1.0000	
weight	.7529	.7901	.7402	1.0000
Single platform (n=59)				
length	1.0000			
width	.9128	1.0000		
thickness	.8566	.8796	1.0000	
weight	.8496	.8595	.7953	1.0000
Two platforms adjacent (n=44)				
length	1.0000			
width	.8802	1.0000		
thickness	.8331	.8571	1.0000	
weight	.8556	.8581	.8831	1.0000
Two platforms parallel (n=13)				
length	1.0000			
width	.9012	1.0000		
thickness	.6510**	.6707**	1.0000	
weight	.8951	.9134	.8294	1.0000
Three platforms (n=16)				
length	1.0000			
width	.7526	1.0000		
thickness	.4866**	.8116	1.0000	
weight	.6859*	.9224	.8211	1.0000
Flake (n=100)				
length	1.0000			
width	.7460	1.0000		
thickness	.5468	.5884	1.0000	
weight	.7760	.8531	.7480	1.0000

[1]Pearson's r, 2-tailed test; significant at the .001 level unless otherwise specified.

*Significant at the .01 level.

**Not significant.

Table 7. LA 68182: summary statistics of complete core-reduction flakes.

n=4,468	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
Descriptive statistics				
mean	15.49	14.14	4.13	1.33
SD	6.78	5.90	2.39	2.64
range	60.0	63.0	25.0	54.6
Correlation matrix of dimensions				
length	1.0000			
width	.6100	1.0000		
thickness	.6908	.6541	1.0000	
weight	.6971	.6720	.7235	1.0000

Table 8. LA 68182: summary of selected observations on core-reduction flakes.

Attribute	Number	Percent
Platform types		
cortex	675	15%
single flake scar	2030	45%
multiple flake scars	763	17%
pseudodihedral	60	1%
edge or ridge-like remnant	593	13%
destroyed during detachment	341	8%
indeterminate	5	<1%
total	4467	100%
Distal termination type		
feathered	1463	33%
modified feathered	1028	23%
hinged or stepped	1955	44%
total	4446	100%
Dorsal cortex		
0%	2746	62%
1-10%	491	11%
11-25%	455	10%
26-50%	325	7%
51-75%	193	4%
76-90%	121	3%
91-99%	72	2%
100%, including platform	27	1%
total	4430	100%

The results for LA 68182 (Fig. 30) show very low response overall: 87% no response (n=5,674), 12% low response (n=771), 1% medium response (n=74), and <1% bright response (n=7). These figures group LA 68182 with the main group of sites analyzed to date. The main group includes the River Camp (LA 103931), a possible trade camp near the east bank of the Pecos river and 25 km northeast of Roswell (Wiseman 2000a); Corn Camp (LA 6825), a small multicomponent, mostly pottery period camp located west of the Pecos River and 13 km north of Roswell (Wiseman 1996b); La Cresta (LA 6826), a possible pottery period lithic material pick-up quarry west of the Pecos River and 13 km north of Roswell (Wiseman 1996b); and the White Paint site (LA 54347) described in this report.

Three sites differ markedly in that they have considerably more medium and bright responses. These are the Bob Crosby Draw site (LA 75163), a mainly fourteenth century base camp located east of the Pecos River and 25 km northeast of Roswell; the Fox Place (LA 68188), a thirteenth to fourteenth century hunter-gatherer structural site located on the southwest outskirts of Roswell; and the Rocky Arroyo site (LA 25277), possibly a late Glencoe phase pithouse village located on the Rio Hondo 3 km upstream (south) from the Fox Place (LA 68188).

At this point we can only speculate about the meaning of these data. The flakes in these data sets are believed to represent mainly, if not solely, the gray cherts available locally near each site. The data sets do not include imported flakes such as Edwards chert and possible Edwards chert to the extent that we were able to identify and remove these materials earlier in the analysis.

Thus, the intention is that this approach will enable recognition of intraregional differences in local gray cherts at some level, thereby facilitating recognition of group movements within the region. With this in mind, it is important to note that the five grouped sites—Corn Camp, La Cresta, Los Molinos, White Paint, and the River Camp—are all located within an area 24 km in diameter that starts at the northwest edge of Roswell and extends northeastward towards the Pecos River. The occupants of four of the sites (Corn Camp—LA 6825, La Cresta—LA 6826, Los Molinos—LA 68182, and White Paint—LA 54347) had fairly ready access to outcrops of the San Andres formation, the presumed source of the gray cherts. The River Camp (LA 103931) had less ready access, but as suggested in the report (Wiseman 2000a), this site may be a trading camp used both by farming peoples from west of the river and by the occupants of Bob Crosby Draw.

On the other hand, the Bob Crosby Draw site, the Rocky Arroyo site, and the Fox Place lie outside the area occupied by those four sites. Bob Crosby Draw lies farther to the northeast and, probably more importantly, is east of the Pecos where the San Andres formation does not outcrop. The Fox Place and Rocky Arroyo are 8 to 11 km south of the nearest of the four sites (White Paint) but otherwise are in a similar geologic environment. Yet, the UV profiles of the Fox Place and Rocky Arroyo, whether on the basis of within-site groups or for the site as a whole, differ significantly. Are we seeing the kind of intraregional difference in lithic materials that we think might exist? The UV profiles of more sites will have to be documented before we can be certain, but this is a start.

One other possibility must be addressed before closing this discussion. Although we identified and removed all suspected Edwards chert items from the bulk lithic data sets, we still have to bear in mind the fact that the Edwards chert identification procedures and criteria are not guaranteed. As mentioned elsewhere, it is clear from the available Edwards chert source materials that we may not have identified all Edwards chert present in the various collections. That is, Edwards chert encompasses a range of texture and therefore of knapping quality. Successful identification of all Edwards chert items in southeastern New Mexico assemblages may never be possible. Thus, we must bear in mind that

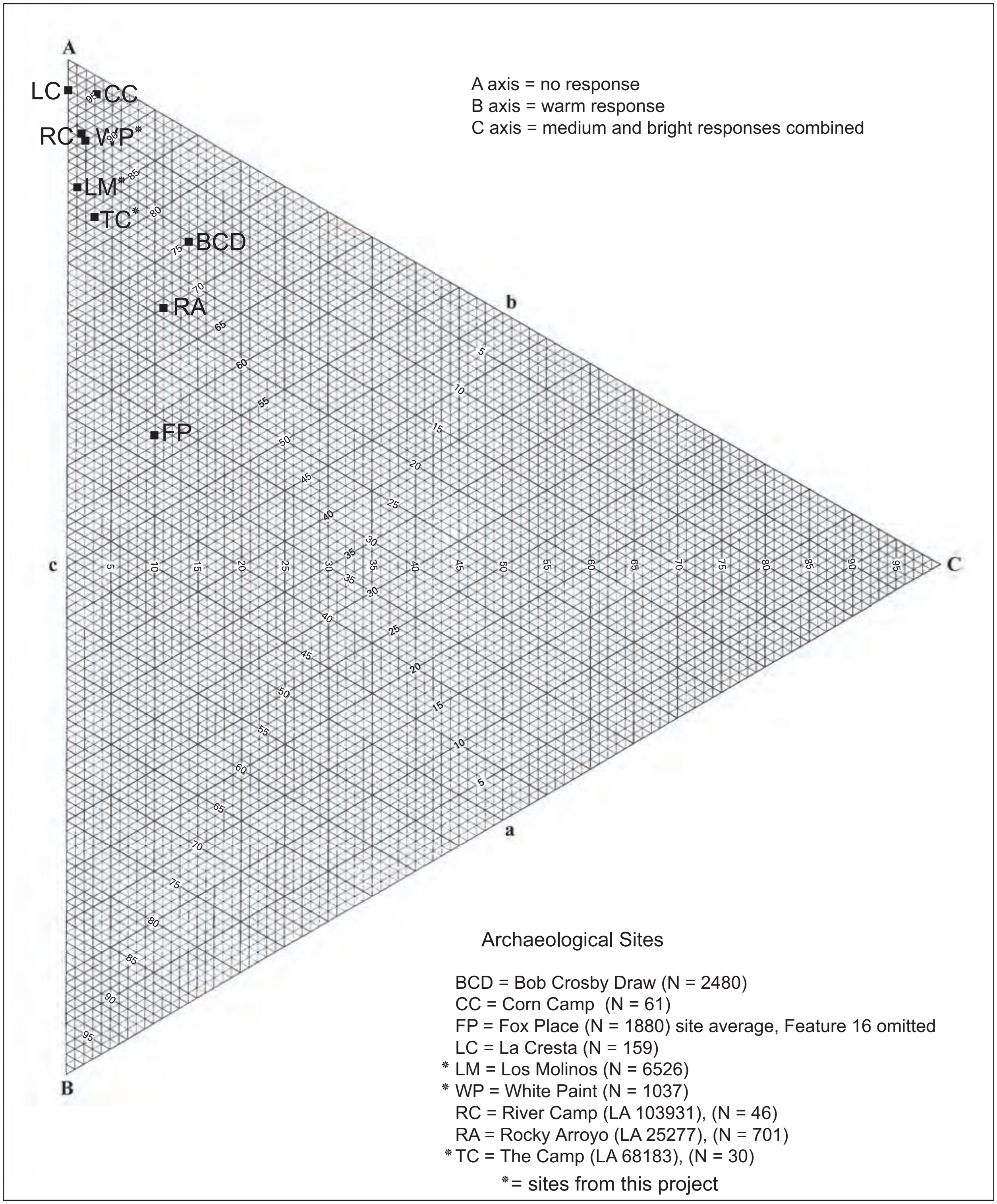

Figure 30. LA 68182: tripolar distributions of local gray cherts.

some of the items that fluoresced medium or bright in the bulk collections from the various sites could be Edwards chert.

Pottery

A total of 4,527 sherds—representing six painted types, four named utility types, three groups of related painted types/wares, and three unnamed utility groups—were recovered from Los Molinos (LA 68182) (Table 9). Generally speaking, the sherds are small, which made some observations difficult or impossible. Accordingly, the analysis follows the "short" format of the Bob Crosby Draw study (Wiseman 2000a).

All painted decorated sherds and imported utility sherds from surface and excavated proveniences were analyzed. These were segregated during an initial pass through all collection sacks. However, because the brown wares (n=3,746, 82.7%) constitute the clear majority of the assemblage, only a sample was analyzed. The squares sampled were those from which the lithic debitage sample was obtained (see that section for details), with a desire in this case to include a minimum of one-third of the brown ware sherds. The analysis sample is 1,434 brown ware sherds, or 38.3% of the total brown ware assemblage and 31.7% of the excavated pottery assemblage.

The pottery types were each treated according to a series of expectations, research leads, interests, etc. developed over the past 15 years. Minimum number of vessels was determined for most types, with varying degrees of success depending on the type. The other attributes and observations are discussed on a type-by-type basis below.

Plain brown ware is the most common pottery at the site. Because most sherds are so small, analysis began by placing the sherds from each bag, one bag at a time,

Table 9. LA 68182: analyzed pottery by sherd count and estimated minimum number of vessels (MNV).

Pottery Type[1]	Number	Percent	MNV	MNV%[2]
Red-washed/slipped brown ware	237	35.9%	6	13.6%
Miscellaneous red-on-brown types[3]	4	0.6%	4	9.1%
Broadline Red-on-terracotta	9	1.4%	1	2.3%
Mimbres Black-on-white	38	5.7%	3	6.8%
Lino/Kana'a Gray	4	0.6%	1	2.3%
Chupadero Black-on-white				
all	190	28.7%	20	45.5%
bowls	111	16.8%	14	31.8%
jars	79	12.0%	6	13.6%
Three Rivers Red-on-terracotta	53	8.0%	3	6.8%
Three Rivers ware	43	6.5%	NA	NA
El Paso Polychrome	44	6.7%	2	4.5%
Agua Fria Glaze-on-red	13	2.0%	1	2.3%
Unknown plain/indented corrugated	26	3.9%	3	6.8%
Total painted and imported[1]	661	100.0%	44	100.0%
Jornada Brown	609	42.5%	17	
South Pecos Brown	278	19.4%	1	
El Paso Brown (Polychrome?)	158	11.0%	4	
McKenzie Brown[4]	8	0.6%	1	
Unknown/uncertain brown	74	5.2%		
Brown ware sherds too small to analyze	307	21.4%		
Total local utility[1]	1434	100.0%	23	

[1]All painted and imported pottery types were analyzed, but only 38% (1,434 of 3,746) of the brown ware body sherds were analyzed (all types combined). All brown types combined constitute 82.7% of the total pottery assemblage (surface-collected and excavated) from the site. Brown ware MNVs are based on rim sherds only, all of which were studied (i.e., not just those from the analysis sample).

[2]Pertains only to those vessels for which MNV estimations were made.

[3]All rim sherds.

[4]No rims of McKenzie Brown were recovered, but the presence of sherds of this type indicates at least one vessel.

in a line, starting with the largest and proceeding to the smallest. All sherds too small to allow accurate identification of surface characteristics and/or to permit snipping an edge to expose the temper were placed in the "too small" category and counted but were not otherwise analyzed. Because several identifiable types of brown pottery are present, the appropriate letter for the type was written on each sherd (J=Jornada Brown; SP= South Pecos Brown; and EP=El Paso, probably Polychrome though lacking paint, unless otherwise noted under Remarks). A small number of sherds could not be attributed to a defined type; thus, no entry was made under the Type column on the analysis sheets, and for the most part, no mark was made on the sherds.

Notes on the Pottery Types

Agua Fria Glaze-on-red (Rio Grande Glaze A Red). Eleven tiny sherds are from a single, thin-walled, small bowl (Vessel 1), and a twelfth represents a second, probably larger bowl. Vessel 1 has a red paste, crushed sherd or dark gray rock temper, and wide line designs in black glaze paint. All sherds are from the surface or Level 1 (0 to 10 cm). Vessel 2 has a gray paste and crushed white rock temper but lacks paint; the sherd is from Level 5 (40 to 50 cm).

Broadline Red-on-terracotta. The few sherds attributable to this "type" are too small to merit discussion; line width could be measured only on a very small number. The sherds were counted but not analyzed further.

Chupadero Black-on-white. This type continues to be of considerable interest because of its prominent place in the pottery assemblages of southeastern New Mexico, and because the possibility that the bowl-to-jar ratio could provide a clue to the cultural identity of sites in the Roswell region.

Analysis included the characterization of temper, surface finish, and designs of the recognizable vessels. Most of the sherds not attributable to specific vessels were merely tallied because they are too small to analyze.

Three aspects of the Chupadero Black-on-white assemblage are worth mentioning. First, the pastes of most sherds are more granular than is usual for the type, suggesting the use of different clays and possibly different manufacturing areas. This same phenomenon was noted in the Bob Crosby Draw assemblage.

Second, the temper of most sherds is profuse, finely crushed potsherd, which this author heretofore believed to be characteristic mainly of Chupadero from Pueblo Colorado in the central part of New Mexico. The sherd temper in the Los Molinos Chupadero is rarely vitrified, however—another characteristic of Pueblo Colorado Chupadero.

Third, some of the jar sherds, notably from Vessels 17 and 19, have smooth interior surfaces. Were it not for the fact that other attributes of these vessels fail to match Jelinek's descriptions (1967), it would be tempting to suggest that these sherds (and vessels) represent Crosby Black-on-gray and Middle Pecos Black-on-white, respectively. Elsewhere, this author has questioned the validity of these last two types (Wiseman 2000:44).

El Paso Polychrome. Virtually all of these sherds were very small (size of a ten-cent coin). At least two vessels, a jar and a bowl, are represented. Only a jar rim is present: a late-style rim with an estimated inside diameter of 28 cm, an eversion angle of 168 degrees, and incremental thicknesses (from the lip downward) of 7 mm at 0.5 cm, 6.5 mm at 1 cm, and 4 mm at 2 cm.

Lino Gray or Kana'a Neckbanded. These four gray ware body sherds are classic examples of these two Anasazi utility types. The presence of unground clay plates in two of the sherds could indicate manufacture in the Grants region of northwestern New Mexico (A. H. Warren, pers. comm., 1974). Because of the distance from Grants to Roswell (approximately 365 km), it is almost certain that only one vessel is represented.

Mimbres Black-on-white. Thirty-four of the 38 Mimbres sherds may represent a single bowl (Vessel 2). Two different bowls are represented by the remaining four sherds. Vessel 2 is clearly Style 2. Vessel 1 could be Style 3 or Mimbres Classic. The style of the third bowl is uncertain.

Red-Slipped Brown. This is the most common decorated pottery at Los Molinos. The MNV of six vessels (all bowls) is based solely on rim sherds and is almost certainly too low. All six vessels are tempered with crushed igneous rock of the Sierra Blanca country; the pastes are dark gray to black, either in total or as wide carbon streaks; the interior decorated surfaces vary from well smoothed and polished to moderately smoothed and streakily polished; and all but one are thinly red-slipped on the interior surface but may or may not be slipped on the lip. The exception is thickly red-slipped on the interior, on the lip, and on the exterior for a distance of 15 mm below the lip.

Unknown plain/indented corrugated. These sherds do not form a coherent group other than the fact that they are all gray wares. The main group of sherds, representing two vessels, could be plain ware, and the single sherd is from an indented corrugated vessel.

Judging from the pastes, all but one of the main group of sherds belong to a single vessel represented by a partially reconstructible orifice and several small unconnected body sherds. The orifice is strongly everted. The surfaces are not particularly well smoothed, largely because the quartz mica schist temper is rather coarse. The silvery mica is profusely evident on the surfaces. These sherds might be typed as Middle Pecos Micaceous Brown except for the facts that they are gray ware (not brown), and the temper and vessel form are wrong for the type (cf. Jelinek 1967).

The one indented corrugated sherd differs from those just described in several important ways. The sparse temper includes quartz, golden biotite, and an unidentified, shiny-black mafic mineral (not magnetite). Natural inclusions of the clay include unground carbonaceous clay pellets and profuse fine grains of a yellowish carbonate that show solely on the exterior surface. The interior surface is deliberately smudged. The exterior surface has shallow indentations, but these are not flattened, smoothed over, or obliterated in any way. The indentations are quite different from those on Corona Corrugated, broadly defined as that type is.

El Paso Brown. Most of these sherds are probably the unpainted bottom sherds of polychrome vessels.

Jornada Brown. The sherds assigned to this type are what this author has come to think of as lowland or thin Jornada. That is, the sherds have the typical ranges of temper types, particle sizes and profuseness, and surface finish as highland (or classic or Sierra Blanca) Jornada. But, on the whole, the lowland Jornada surface colors are generally lighter (often tending towards the light reddish browns and light grayish browns), and the walls are thinner, averaging 5.39 mm (SD=0.8904; n=597). Perhaps half a dozen Los Molinos sherds are somewhat thicker and have the chocolate brown surfaces that conform to the highland or Sierra Blanca variety of Jornada, the variety originally described when the type was first named (Jennings 1940; Mera 1943; see also Wiseman 2001b).

McKenzie Brown. The sherds were assigned to this type because of minute particles of mica on the surfaces. In no instance is the mica particularly obvious on the surfaces or within the paste. The surfaces of most sherds are smoothed to streakily polished; a couple are well polished. The tempers are mostly crushed quartz with minor quantities of small mica flecks, but a couple have feldspar and little or no quartz. All in all, the Los Molinos sherds fit the description of the type (Jelinek 1967) moderately well.

South Pecos Brown. The sherds of this type were assigned on the basis of temper particle size and composition, paste texture, and surface finish. Temper particle size is a primary criterion in identifying this type—the larger the particles, the fewer their number in the paste, and the blockier the paste appears to be because the feldspar crystals are generally large (in the order of 0.5 mm) and angular.

The temper itself is generally limited in composition and almost always (74% at Los Molinos) has at least some gray feldspar. Fully 23% of the Los Molinos sherds are tempered solely with opaque gray feldspar, a highly distinctive variety that derives from a syenite of an as yet unknown source in the Sierra Blanca (A. H. Warren, pers. comm., ca. 1975). Virtually all other temper types noted in the Los Molinos South Pecos Brown are from either a monzonite, quartz monzonite, or other closely related intrusive igneous rock.

Most of the sherds possess the characteristic surface finish of South Pecos: a slightly shrunken surface clay that draws back from the larger temper particles (causing them to protrude through the surface), resulting in minute cracks that radiate outward from each particle (cf. Jelinek 1967).

CHAPTER 7

LA 68183—The Camp

Site Description

LA 68183 was described at the survey stage as a 6-by-5-m artifact and hearth scatter with two hearths, six lithic artifacts (knapping debitage), and a single plain brown potsherd (Wiseman 1989, 1992). The site was situated in a low area immediately north of Los Molinos and the high hill on which it sits (see Fig. 4). Beyond this hill lies the Middle Berrendo River, a formerly perennial, artesian-spring-fed stream. Site elevation is 3,589 feet (1,094) m above mean sea level.

The total remaining size of LA 68183 (some of the site was probably removed during construction of the access road to the north) was found to be 18 m north-south by 36 m east-west. Four possible hearths were ultimately defined from surface indications, but only one, Feature 1, was found to be reasonably intact upon excavation. Burned rocks and additional surface artifacts (all lithic debitage) were also found in greater abundance, though the site can still be characterized as small with thinly scattered remains. The potsherd noted during the survey could not be found despite several thorough searches of the site during data recovery.

Field Activities and Description of Feature 1

First, surface artifacts were located, pinflagged, pinpoint-mapped, and collected. Twenty-four items, including a biface fragment, were documented in this manner. As mentioned above, the single potsherd noted during the survey could not be relocated. At the same time, all burned rocks were also mapped (Fig. 31). Then the four possible hearth locations were exposed by trowel-stripping 1-by-1-m squares around them. Excavations were carried to hardpan at a depth of approximately 5 cm. All fill was screened through quarter-inch wire mesh; artifacts were bagged by square.

Twenty-two 1-by-1-m squares were excavated: nine around possible Hearth 1, six around possible Hearth 2, three around possible Hearth 3, and four around possible Hearth 4 (Figs. 32 and 33). Although burned rocks were exposed at all four locations, only one (Hearth 4, now designated Feature 1) proved to be an intact hearth. The other three locations remain problematic. No charcoal fragments or stains or other evidence of burning (reddened soil) were noted in any of the excavated squares. A sligh depression of small diameter associated with possible Hearth 3 might be the bottom of a hearth pit. This, too, is problematic because the depression was not reddened and lacked other evidence of burning.

Hearth (Feature 1)

This rectangular concentration of 64 limestone rocks lay mostly in a single plane on an old ground surface immediately above the hardpan. Although a number of very small rock fragments were present, the main rocks, about 16 in number, averaged approximately 8 by 6 by 5 cm. No charcoal, charcoal staining or reddening of the soil was noted.

Artifacts

One formal artifact (arrow point fragment) and two informal artifacts (flake tools) were recovered from LA 68183. The fragmentary base of a corner-notched arrow point came from the surface of square 1S 8E. It is made of an orange chert, measures 12+ by 11+ by 5+ mm, and has an incomplete neck width. One flake tool (Flake 1, fragmentary) came from the fill of square 1N 32E, next to possible Hearth 1. Its one use-worn edge is straight and has 10 mm of unifacial retouch. The other flake tool (Flake 21, fragmentary) was found 2 m southwest of Feature 1 (definite hearth). It has 18 mm of unifacial, intentional retouch along one straight edge.

Chipped Stone and Manufacturing Debris

Lithic manufacture debris—cores, flakes, shatter, and pieces of material—constitutes the bulk of the lithic

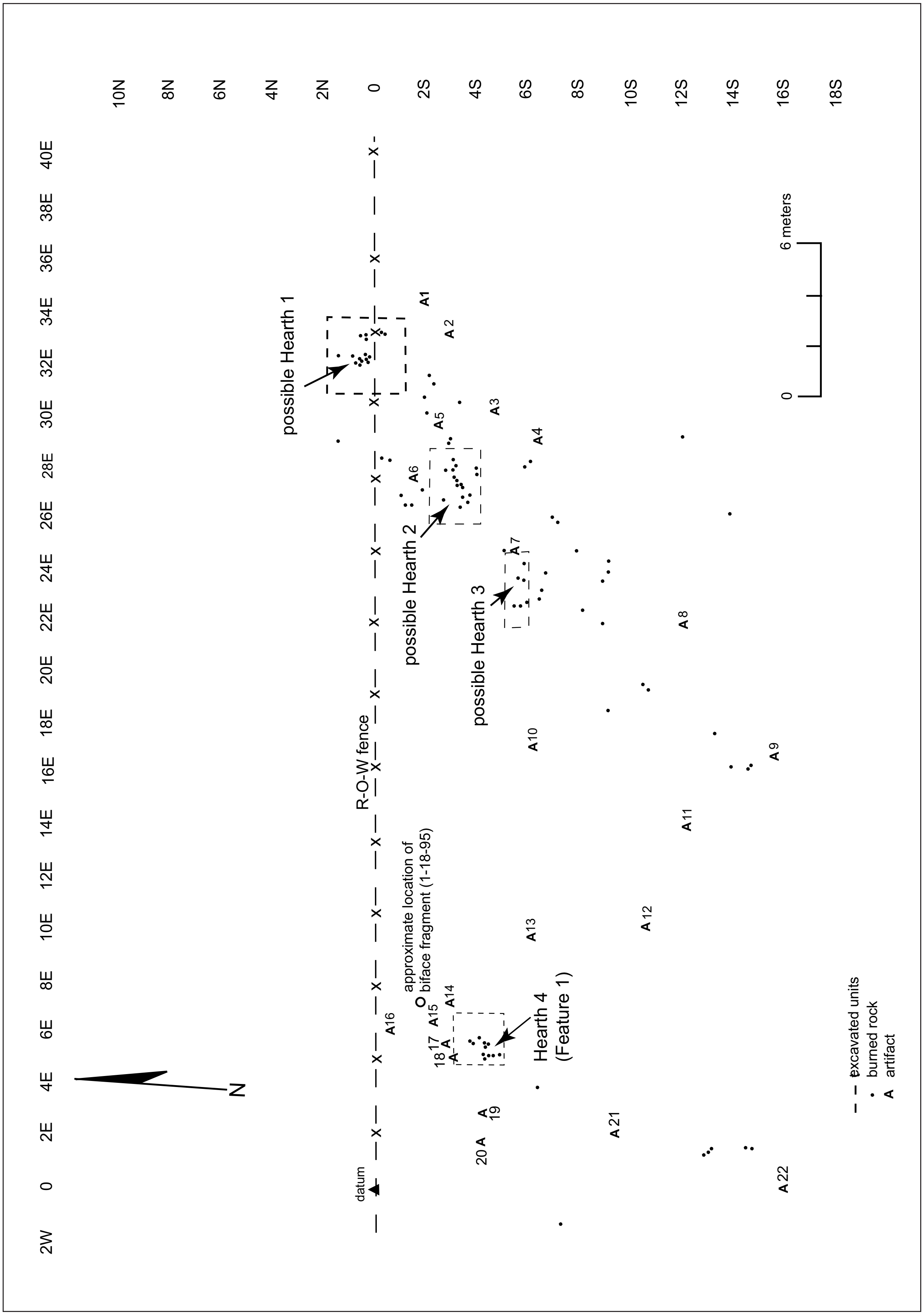

Figure 31. LA 68183: site map showing piece-plotted artifacts and burned rocks and excavated squares.

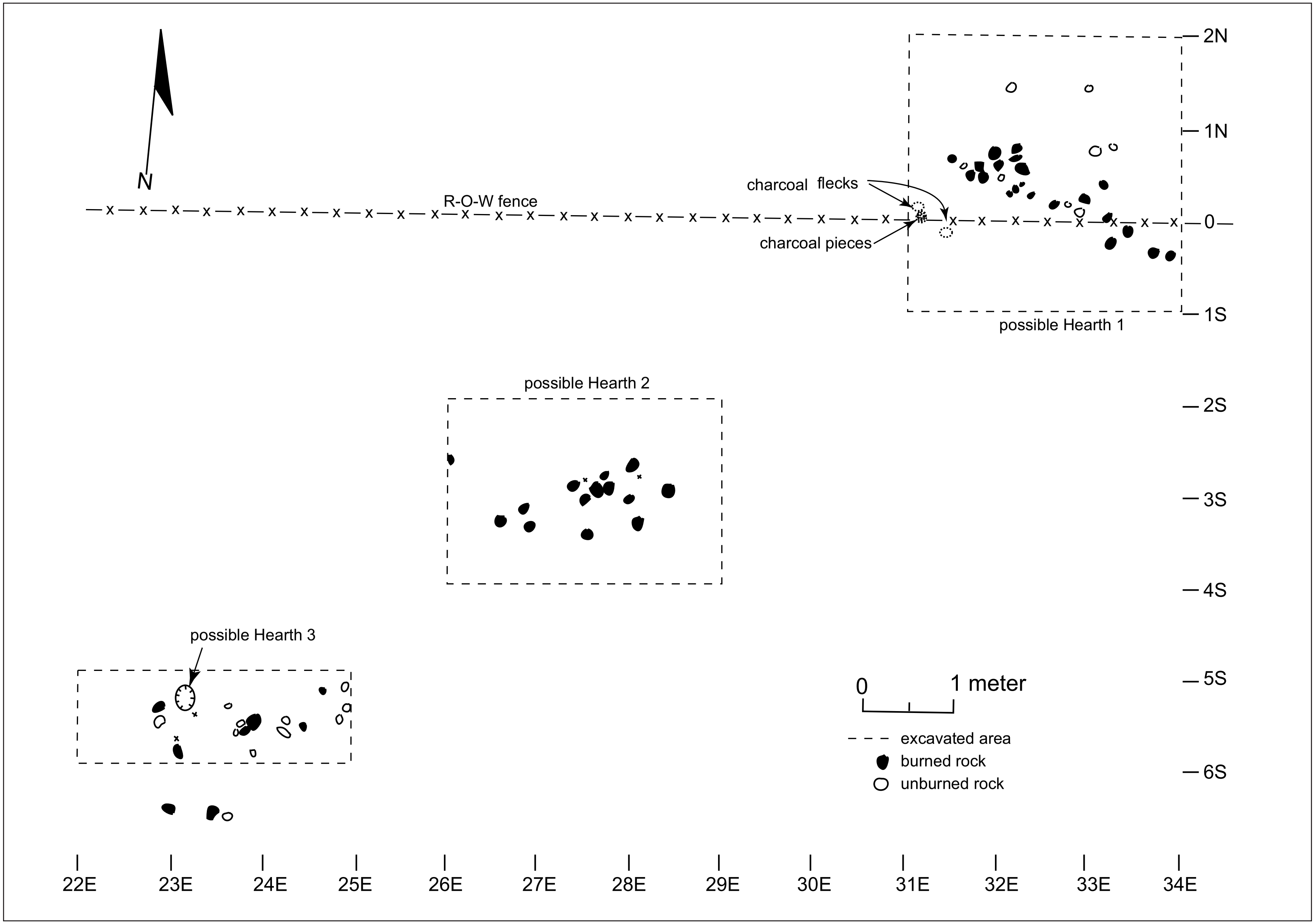

Figure 32. LA 68183: excavations around possible Hearths 1, 2, and 3

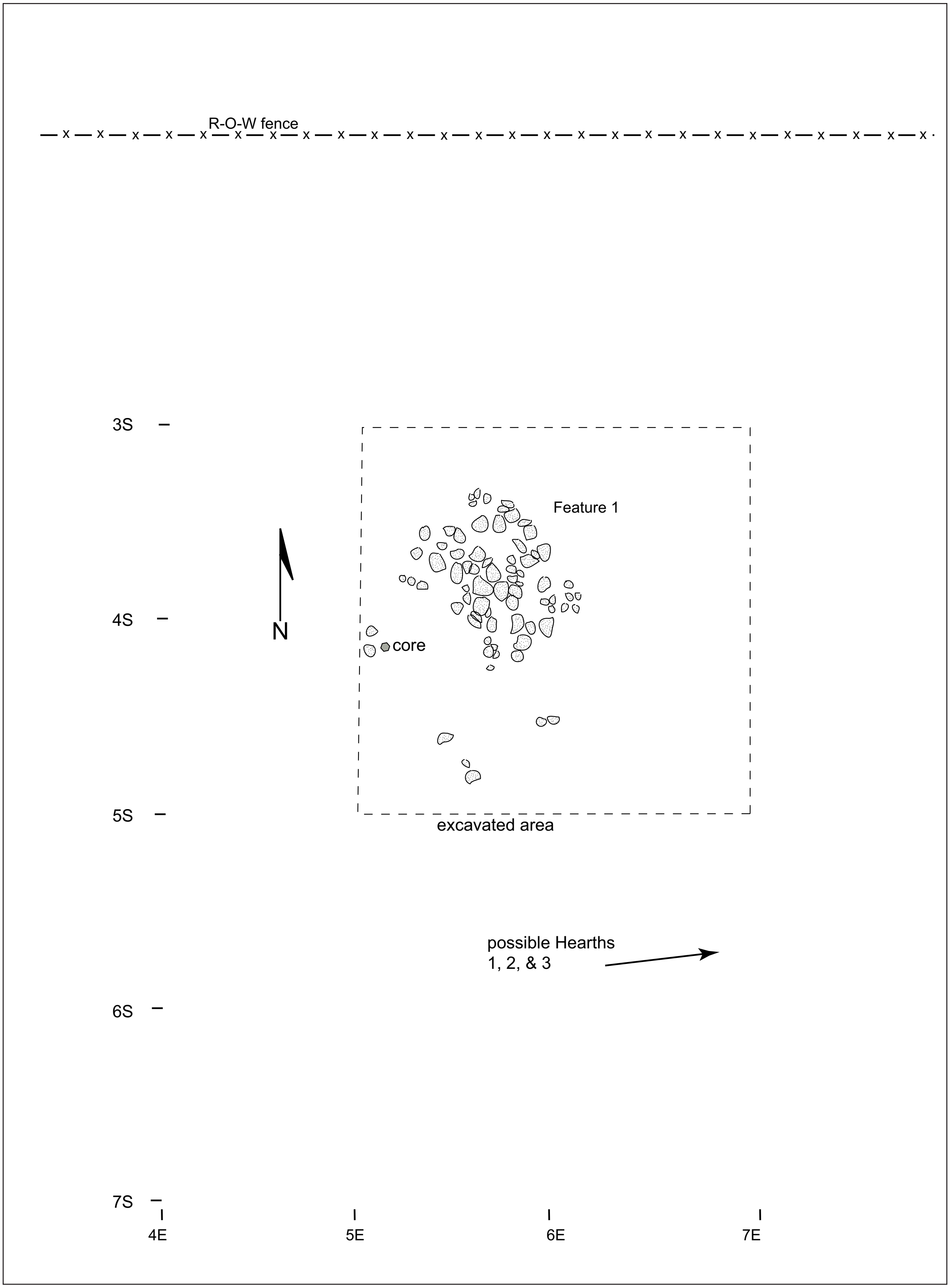

Figure 33. LA 68183: excavations around Feature 1 (formerly possible Hearth 4).

materials recovered from LA 88183 (Table 10). The analysis of these materials, following the standard analysis used by the author in the Roswell region over the past 20 years, focuses on reconstructing the lithic technology and the identification of materials and sources. The results presented here are somewhat abbreviated because of the small sample size. The raw materials and definitions used to classify and analyze chipped lithic debris are described in Appendix 8. The cores and core-reduction flakes are described below. Pieces of debitage bearing use-wear or intentional retouch are described in the section on tools.

Table 10. Summary of lithic manufacture debris.

Manufacture Debris Category	Number	Percent
Cores	7	13%
single platform	2	4%
two platforms adjacent	2	4%
two platforms parallel	1	2%
three platforms	1	2%
tested cobble/pebble	1	2%
Flakes	39	75%
core reduction	37	71%
biface thinning	1	2%
decortication	1	2%
Shatter	6	12%
Total	52	100%

Cores. The seven cores include five subtypes (Table 10), none of which prevails. Materials are dominated by the local gray cherts (Table 11). Sizes vary somewhat (Table 12), but all are small. The smallest core measures 25 by 22 by 17 mm and weighs 11.5 g. The largest measures 61 by 56 by 32 m and weighs 155.5 g. None are heat-treated.

Core-reduction flakes. Only 18 of the 37 core-reduction flakes are complete. Summary statistics (Table 13) indicate that, on average, they are small and light. Nearly 50% of the materials are local gray cherts, followed by other cherts. Heat treatment was rarely used—definite and possible cases total 8%; indeterminate cases total 5%.

Table 11. LA 68183: summary observations on certain lithic debitage classes.

			Flakes									
	Cores		Core Reduction		Biface Thinning		Other		Shatter and Other		Site Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Materials												
local chert	4	57.1%	18	48.6%	1	100.0%	1	100.0%	2	33.3%	26	50.0%
other chert	2	28.6%	12	32.4%	-	-	-	-	3	50.0%	17	32.7%
chalcedonies	-	-	-	-	-	-	-	-	1	16.7%	1	1.9%
siltites/quartzites	1	14.3%	4	10.8%	-	-	-	-	-	-	5	9.6%
other	-	-	3	8.1%	-	-	-	-	-	-	3	5.8%
total	7	100.0%	37	100.0%	1	100.0%	1	100.0%	6	100.0%	52	100.0%
Heat-treated												
no	6	85.7%	32	86.5%	1	100.0%	-	-	6	100.0%	45	86.5%
yes	-	-	2	5.4%	-	-	-	-	-	-	2	3.8%
possibly	-	-	1	2.7%	-	-	-	-	-	-	1	1.9%
indeterminate	1	14.3%	2	5.4%	-	-	1	100.0%	-	-	4	7.7%
totals	7	100.0%	37	100.0%	1	100.0%	1	100.0%	6	100.0%	52	100.0%

Table 12. LA 98183: summary of complete core dimensions.

	Dimensions (mm) and Weight (g)			
Core Type	Length	Width	Thickness	Weight
All cores (n=7)				
mean	41.90	32.70	23.00	53.50
SD	-	-	-	-
range	36.0	34.0	20.0	149.3

Table 13. LA 68183: summary statistics of complete core-reduction flakes.

	Dimensions (mm) and Weight (g)			
n=18	Length	Width	Thickness	Weight
mean	16.11	15.33	4.39	1.78
SD	-	-	-	-
range	32.0	26.0	16.0	7.3

Table 14. LA 68183: summary of selected observations on core-reduction flakes.

Attribute	Number	Percent
Platform types		
cortex	6	25%
single flake scar	12	50%
multiple flake scars	2	8%
edge or ridge-like remnant	4	17%
total	24	100%
Distal termination type		
feathered	15	68%
modified feathered	2	9%
hinged or stepped	5	23%
total	22	100%
Dorsal cortex		
0%	12	67%
1-10%	1	6%
11-25%	3	17%
51-75%	1	6%
76-90%	1	6%
total	18	100%

Single-flake-scar platforms are the most common, followed by cortex platforms (Table 14). The majority (68%) of terminations are modified-feathered; feathered and modified-feathered terminations constitute an unusually high 77% for the Roswell region. This means that the failure rate, indicated by hinged and stepped terminations, is comparatively low at 23%. The dorsal cortex profile is fairly classic in that flakes lacking the material are in the majority, with the other categories trailing off towards zero.

Biface-thinning flakes. One biface-thinning flake is present in this sample. It is incomplete, made of local gray chert, and not heat-treated. It came from the surface, 7 m southeast of Feature 1 (the definite hearth).

Exotic lithic materials. Core-reduction flake no. 36 gave a medium response to stimulation by long-wave ultraviolet light; indicating that it could be Edwards chert. It was recovered from the excavation unit immediately south of Feature 1.

Gray cherts. Exposure of the presumed local gray chert knapping debris (n=30) to long-wave ultraviolet light yielded the following responses: 83% no response, 13% warm response, and 3% medium response (see Fig. 30). This places LA 68183 in the same response group as Los Molinos, White Paint, River Camp, Corn Camp, and La Cresta (see discussion in Chapter 6).

Pottery

The one sherd noted on this site during the survey phase could not be relocated at the time of the data recovery phase; notes made by the author indicate that it was Jornada Brown. It had a light brown, almost terracotta color and was well polished on both surfaces, and was about 5 to 6 mm thick.

CHAPTER 8

LA 54347—White Paint

Site Description

LA 54347 was described by the survey archaeologist as a large camp with widespread lithics, burned rocks, and a hearth (Wiseman 1989, 1992). Site size was estimated as 135 m north-south by 240 m east-west. Auger borings during a testing phase indicated that the site was essentially surficial (Fig. 34).

The site is situated on the south slope and crest of the north terrace along the South Berrendo River, a formerly perennial, artesian-spring-fed stream. Campo del Sur (LA 68185) is directly across the Berrendo. Elevation is 3,629 feet (1,106 m) above mean sea level.

Field Activities

Data recovery work focused on that part of the site lying within the project construction zone. The north and south limits of the investigations were determined by the right-of-way limits. Relative to the archaeological grid baseline established along the project centerline, the archaeological work extended northward to 34N and southward to 50S, for a total north-south distance of 84 m. Along the east-west axis, data recovery operations coincided with the obvious artifact concentration; from archaeological datum, established at Highway Project Station 630+00, the work extended from 16W to 100E, for a total east-west distance of 116 m.

A 2-by-2-m grid was applied to this rectangular area, and 1,803 of these squares (7,212 square meters) were inventoried for burned or possibly burned rock and for artifacts. Squares around the periphery of those inventoried were not inventoried due to decreasing artifact density.

Trowel tests were conducted at 12 locations scattered about the site where surface examination and burned-rock inventorying had suggested the presence of hearths. The fill at each location was carefully troweled, and special attention given to whether or not the rocks were truly clustered and whether or not charcoal flecks or stain or reddening of the soil could be detected. No rocks were noted below a depth of 10 cm. None of these criteria were found, with the result that only one hearth, now designated as Feature 1, was identifiable at the site (see below). The only excavations conducted at LA 54347 were the surface-stripping of 22 squares around and including Feature 1.

Burned Rock Scatter

The surface distribution of burned and possibly burned rocks is impressive for its density and breadth of scatter (Fig. 35). While it is certain that identification mistakes were made (hence use of the term “possible”), we estimate that 80% of the identifications are accurate, which indicates that the site is actually larger than the artifact scatter suggests.

Intuitively, this makes sense when one considers the fact that it is easier to find and more effectively discard burned rocks than small flakes and broken artifacts. This implies, of course, that to some extent the size of the site may be a function of how far burned rocks were thrown to get them out of the way. Thus, the peripheral areas of the burned rock scatter may not be part of the occupation zone and consequently should not be used to infer site size in the strictest sense.

Artifact Scatter

The surface artifacts are concentrated in an oval bounded by lines 18 N, 50 E, 40 S, and 16 W (Fig. 36). It is important to note that occasional artifacts were found well beyond these boundaries, but they seem to be more of a “background” scatter than part of the occupation area as such.

The main occupation area, then, is oval, centered on a slight knob on the edge of the terrace, measures approximately 75 m east-west by 33 m north-south, and has an area of approximately 2,000 square meters. Artifact distribution within the main occupation area is not uniform: density per square meter ranges from 0 to

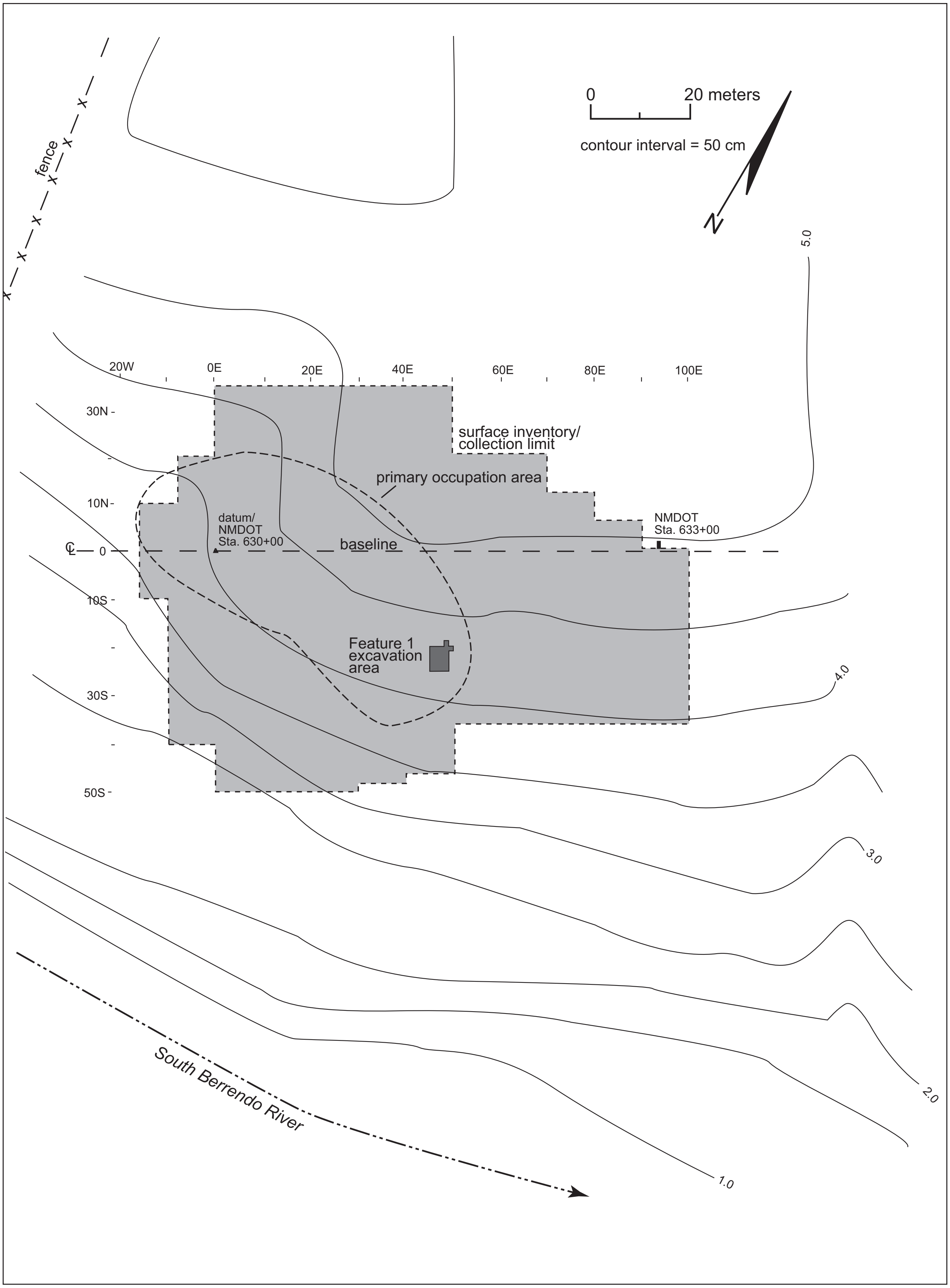

Figure 34. LA 54347: site map.

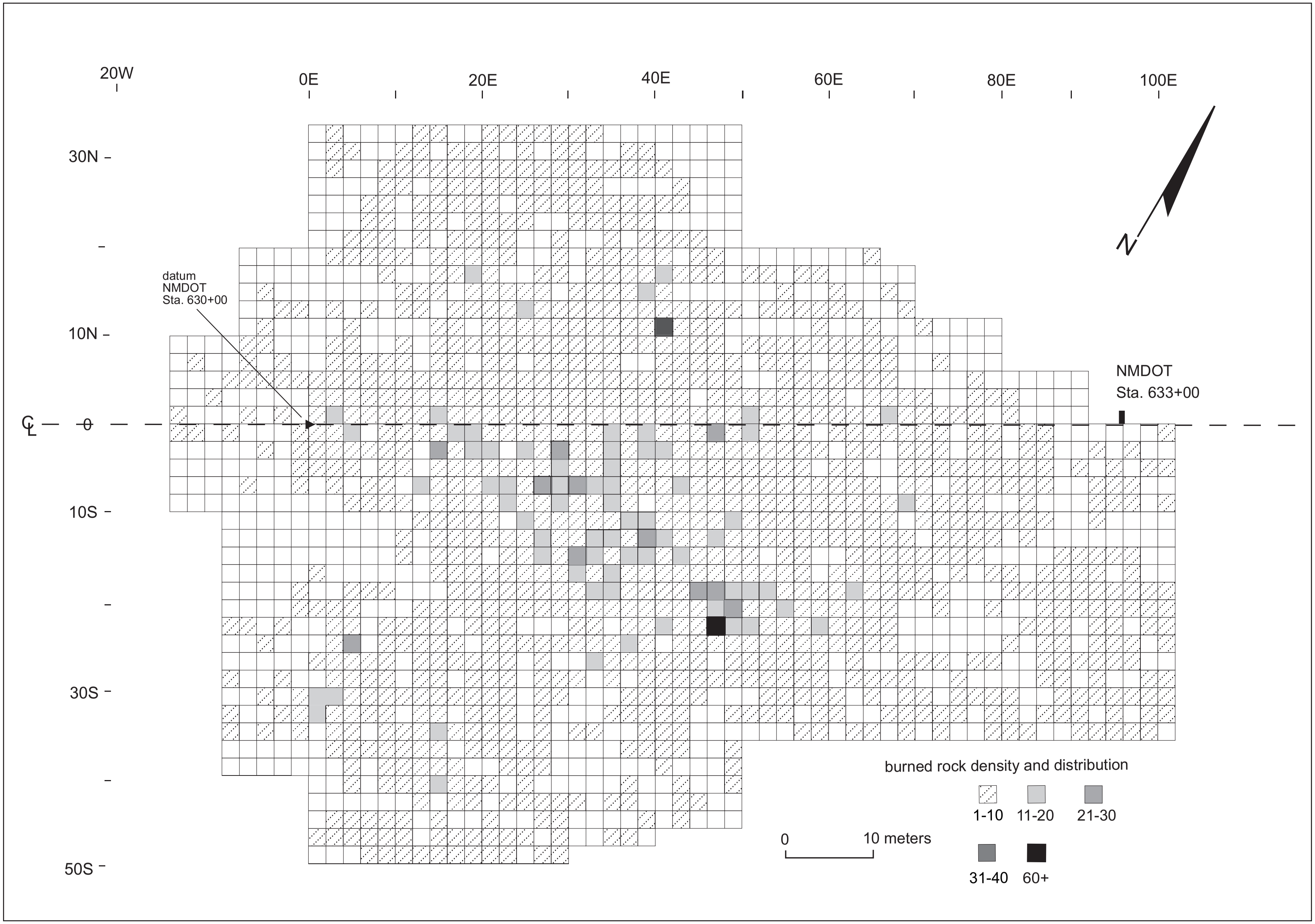

Figure 35. LA 54347: burned rock distribution and density.

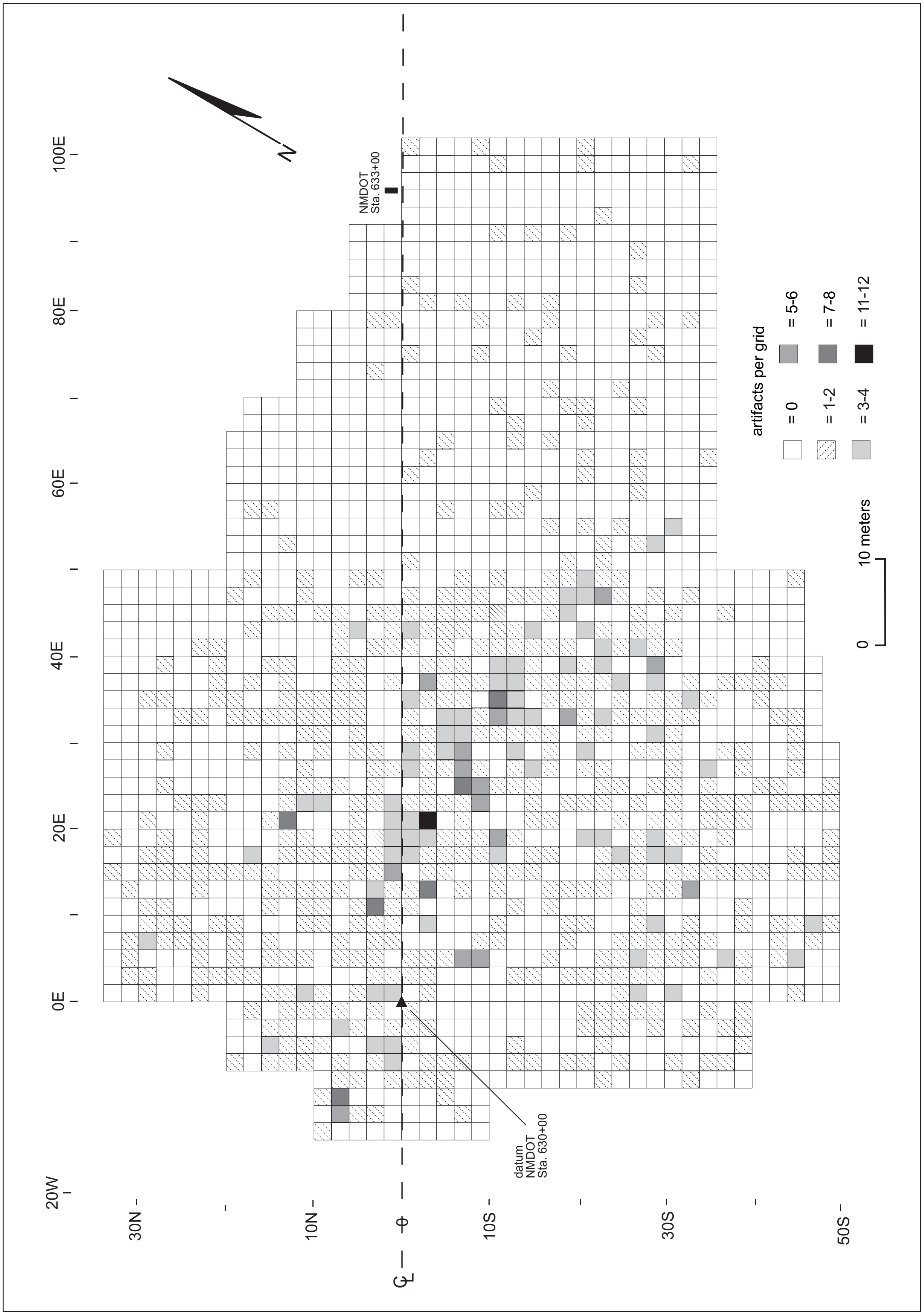

Figure 36. LA 54347: surface artifact distribution and density.

3 items—low compared to the 4.5 items per square meter for the squares excavated around Feature 1.

Hearth (Feature 1)

The one definite hearth (Feature 1, formerly possible Hearth 4) was readily definable from surface observation, and located in squares 22S 47E and 22S 48E. Twenty-two squares (each 2 by 2 m) surrounding the hearth were exposed by troweling and brushing, and all fill was screened through quarter-inch wire mesh. Excavations were carried to hardpan at a depth of 8 to 10 cm below modern surface. All burned rocks in addition to the hearth stones were left in place and mapped (Fig. 37).

This concentration of burned and fractured rocks lay essentially in a plane with only a few of them stacked on one another. The hearth lay on the old ground surface some 5 to 8 cm below the modern surface. There was no underlying pit or depression, nor was the soil reddened or discolored by burning. All charcoal and charcoal-staining had long since disappeared. The overall dimensions of the hearth were 90 by 90 by 10 cm.

Individual rock sizes varied from the largest at 15 by 15 by 7 cm down to the smallest of fragments. The

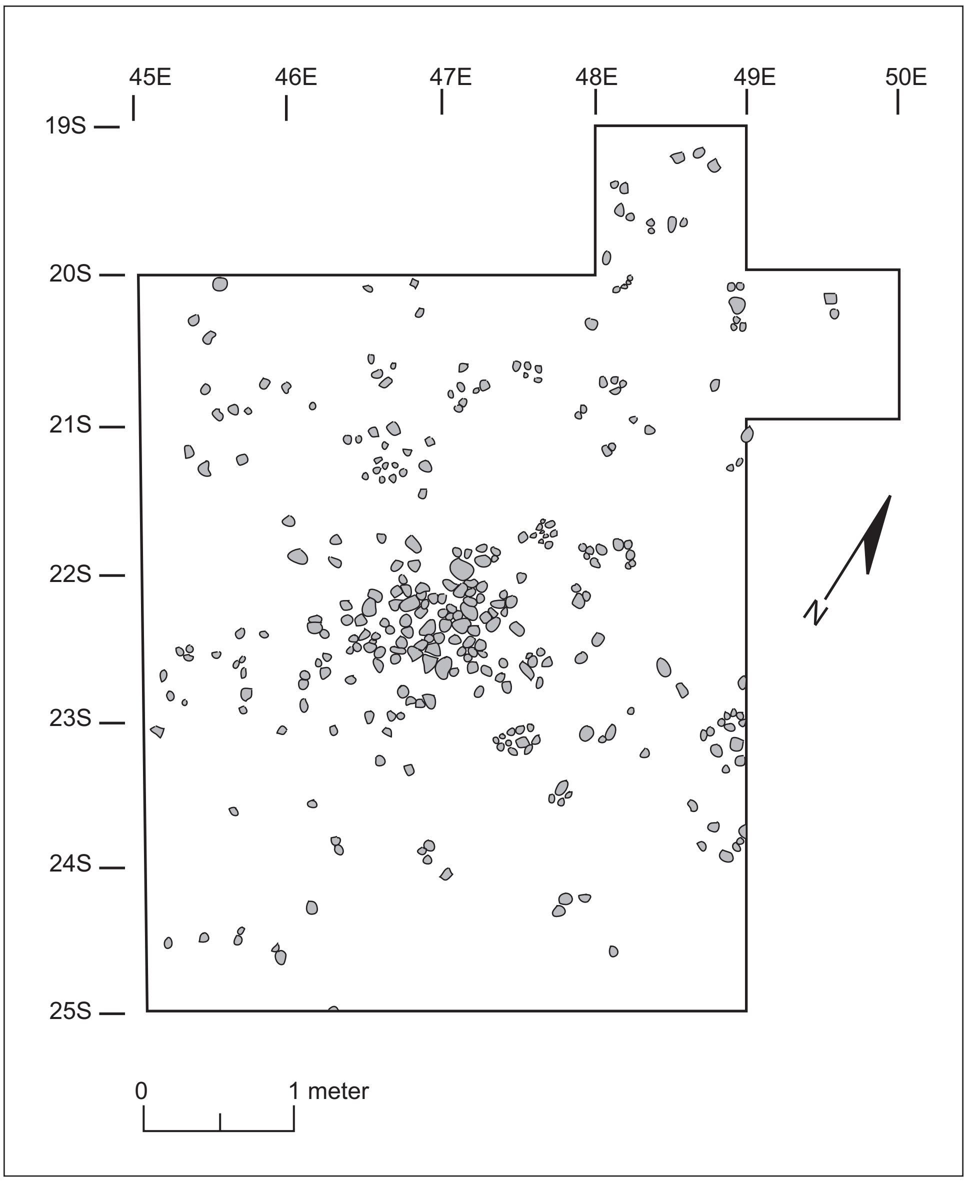

Figure 37. LA 54347: Feature 1 (hearth) excavated.

average was about 5 by 5 by 4 cm. A large number of burned rocks in the vicinity of Feature 1 represent general discard from other hearths, we suspect mostly after Feature 1 was used and abandoned.

The only artifactual materials recovered in the excavations around Feature 1 were about 100 flakes, the stem of an Archaic projectile point (FS 648), and a uniface (FS 664). The point came from the fill of square 19S 49E during screening.

Artifacts

The inventory of artifacts is both small and limited in variety. Classes of items include projectile points, finely flaked bifaces, roughout bifaces, unifaces, and mano and metate fragments. Given the closeness of the site to Roswell and the artifact-collecting proclivities of its inhabitants, especially during the 1950s and 1960s, it is certain that this artifact assemblage, in terms of both artifact variety and numbers, is greatly reduced. The proveniences of individual artifacts are shown in Fig. 38.

Plant-Processing Artifacts

Only three plant-food processing artifacts were recovered: one mano fragment and two metate fragments (Fig. 39).

Mano (n=1). The single mano fragment, FS 419, is part of an oval, one-hand mano with a single, slightly convex grinding surface. The amount of wear is minimal to moderate. No other modification of the stone is evident. Dimensions: 77+ by 53+ by 37+ mm. Material: “dirty” sandstone. Provenience: surface of square 6N 20E.

Metates (n=2). Two small fragments of travel metates were recovered from the surface. FS 192 is the corner of a specimen having one well-developed grinding surface but no other obvious modification of the stone. Dimensions: 83+ by 32+ by 36+ mm. Material: light gray quartz sandstone with hematitic inclusions. Provenience: surface of square 24S 18E.

The other metate fragment, FS 588, comes from the central part of the artifact. It has two well-developed grinding surfaces. Because no edges are present, we cannot determine whether the rest of the stone was modified or “dressed.” Dimensions: 73+ by 38+ by 40+ mm. Material: light gray quartz sandstone (no hematite). Provenience: surface of square 24S 2W.

Hunting-Related Artifacts

Five projectile points are the only artifacts from LA 54347 that represent this functional category. Roughout bifaces, which we assume represent an early stage in the manufacture of projectile points, are described under chipped stone manufacture debris. Other bifaces, some of which probably represent a later stage in projectile point manufacture, are described under miscellaneous artifacts.

One complete and four fragmentary projectile points were recovered from the surface and excavations at LA 54347 (Fig. 40). Judging by neck widths, all are dart points representing the terminal Archaic and possibly the Late Archaic periods of Katz and Katz 1985a (see criteria discussed in Chapter 6). However, as noted in certain instances, some could also be early arrow points.

FS 0-3 is a late terminal Archaic, corner-notched dart point or possibly an early arrow point with about half of the blade missing. Neck width: 9 mm. Dimensions: 18+ by 18+ by 4.5 mm. Material: light gray-brown and dark gray chert. Provenience: surface of square 11S 30E.

FS 0-6 is a terminal Archaic dart point or possibly an early arrow point with a reworked blade tip and part of the base missing. It is either side- or corner-notched, depending on how one defines notching. Neck width: 11 mm. Dimensions: 23+ by 17+ by 6 mm. Material: light gray chalcedonic chert with black speckles and a light brown band of color running through it. Provenience: surface of square 24S 55E.

FS 61 is a complete terminal Archaic dart point or an early arrow point. It is either basally or corner-notched, depending on how one defines notching. Neck width: 10.5 mm. Dimensions: 27 by 19 by 5.5 mm; weight 2.1 g. Material: black or dark brown speckled gray chert that has a light orange tinge caused by heat treating. Provenience: surface of square 6S 30E.

FS 621 is a blade fragment of a large, basally or corner-notched dart point (period uncertain). Neck width: incomplete. Dimensions: 17+ by 22+ by 5+ mm. Material: gray chert heat-treated to brownish orange. Provenience: surface of square 8N 6W.

FS 648 is the stem of a Late Archaic dart point, possibly of the Carlsbad type. Neck width: 14.5 mm. Dimensions: 15+ by 18+ by 5+ mm. Material: mottled tan and light gray chert. Provenience: Level 1 (0 to 5 cm) of square 20S 49E.

Manufacturing Tools

Possible drill (n=1). FS 270 appears to be a lateral fragment of the proximal end of a wing-tip drill (Fig. 40). Dimensions: 20+ by 15+ by 6+ mm. Material: off-white and gray chert; heat-treated. Provenience: surface of square 36S 6E.

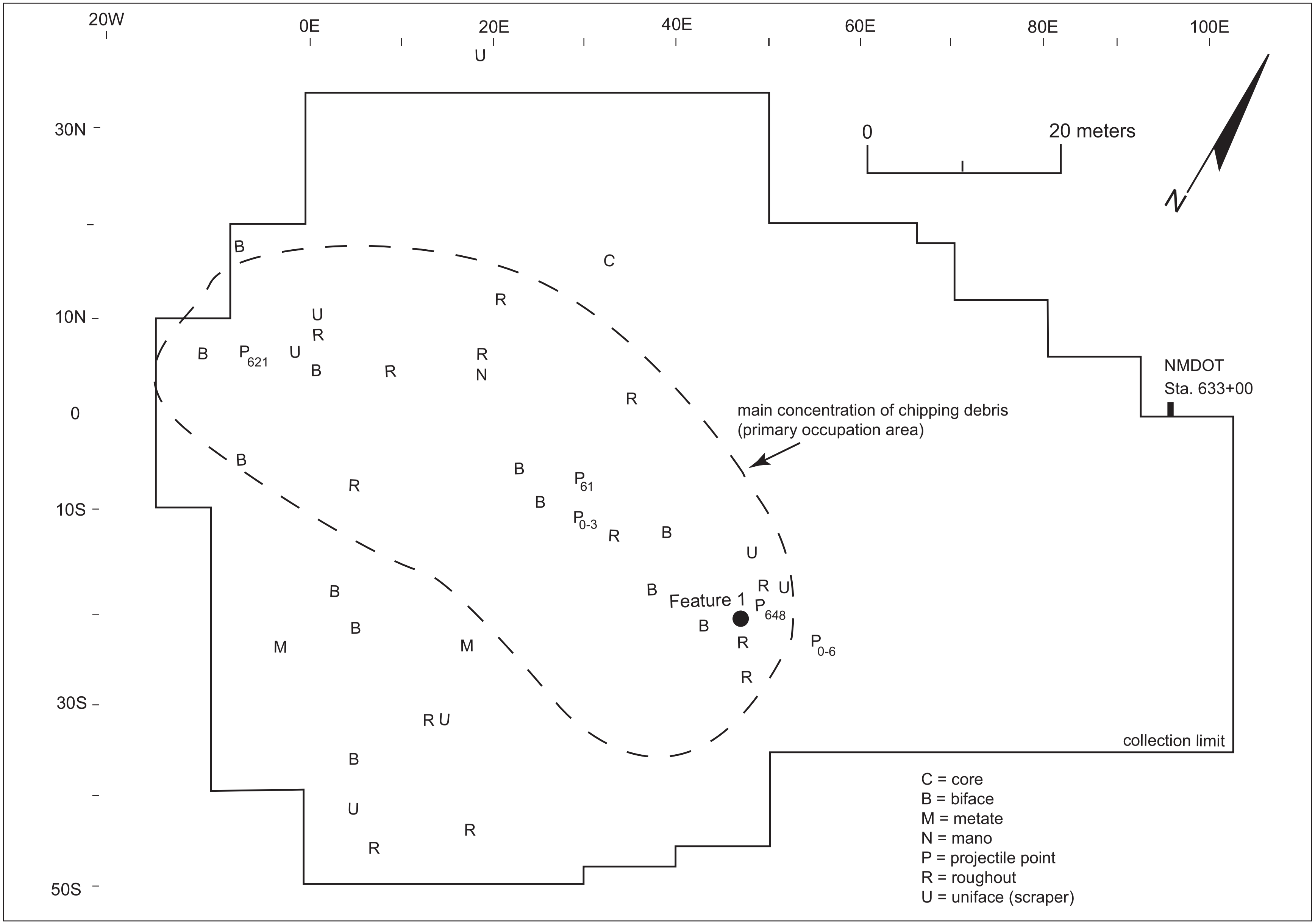

Figure 38. LA 54347: proveniences of individual artifacts.

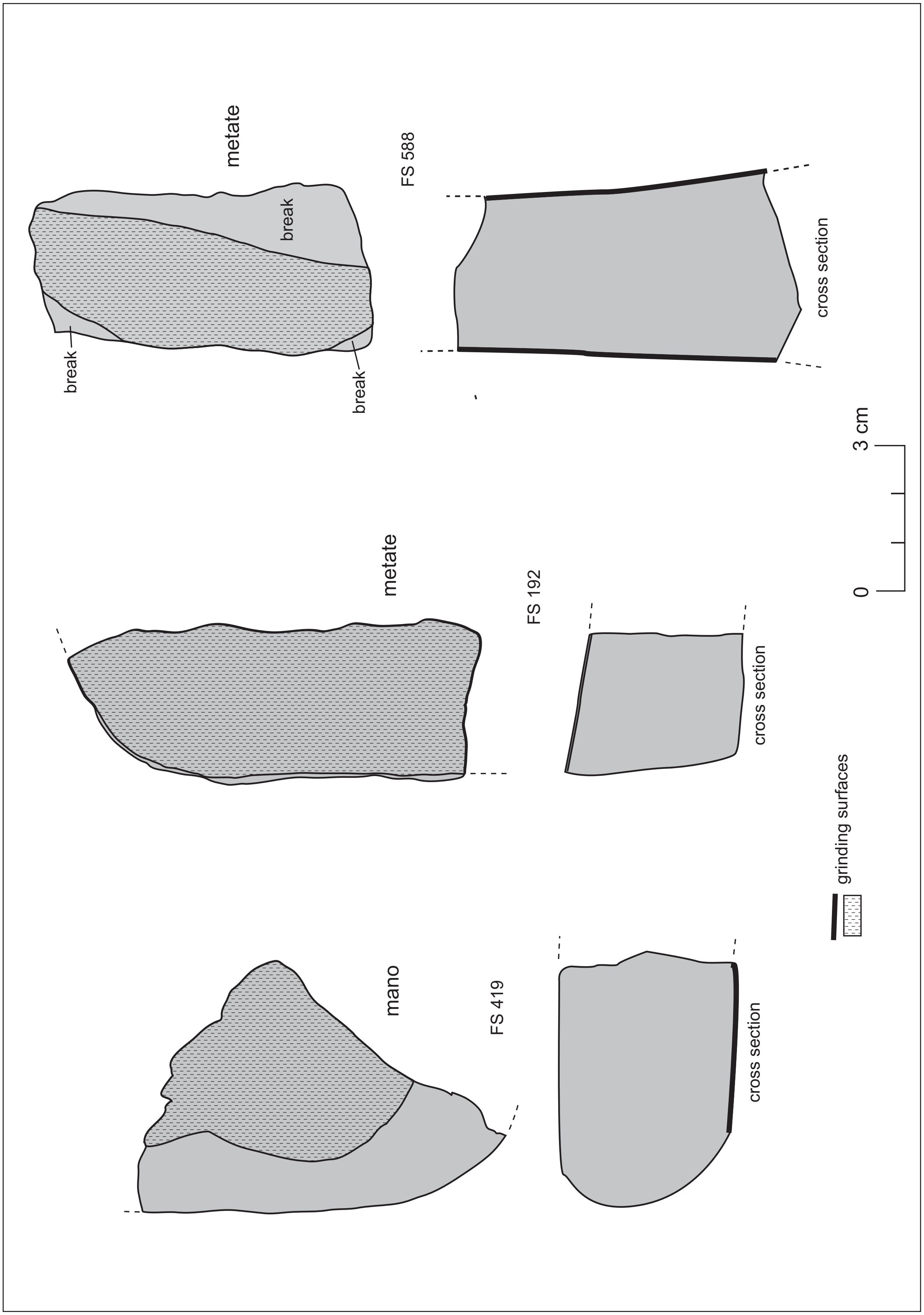

Figure 39. LA 54347: mano and metate fragments.

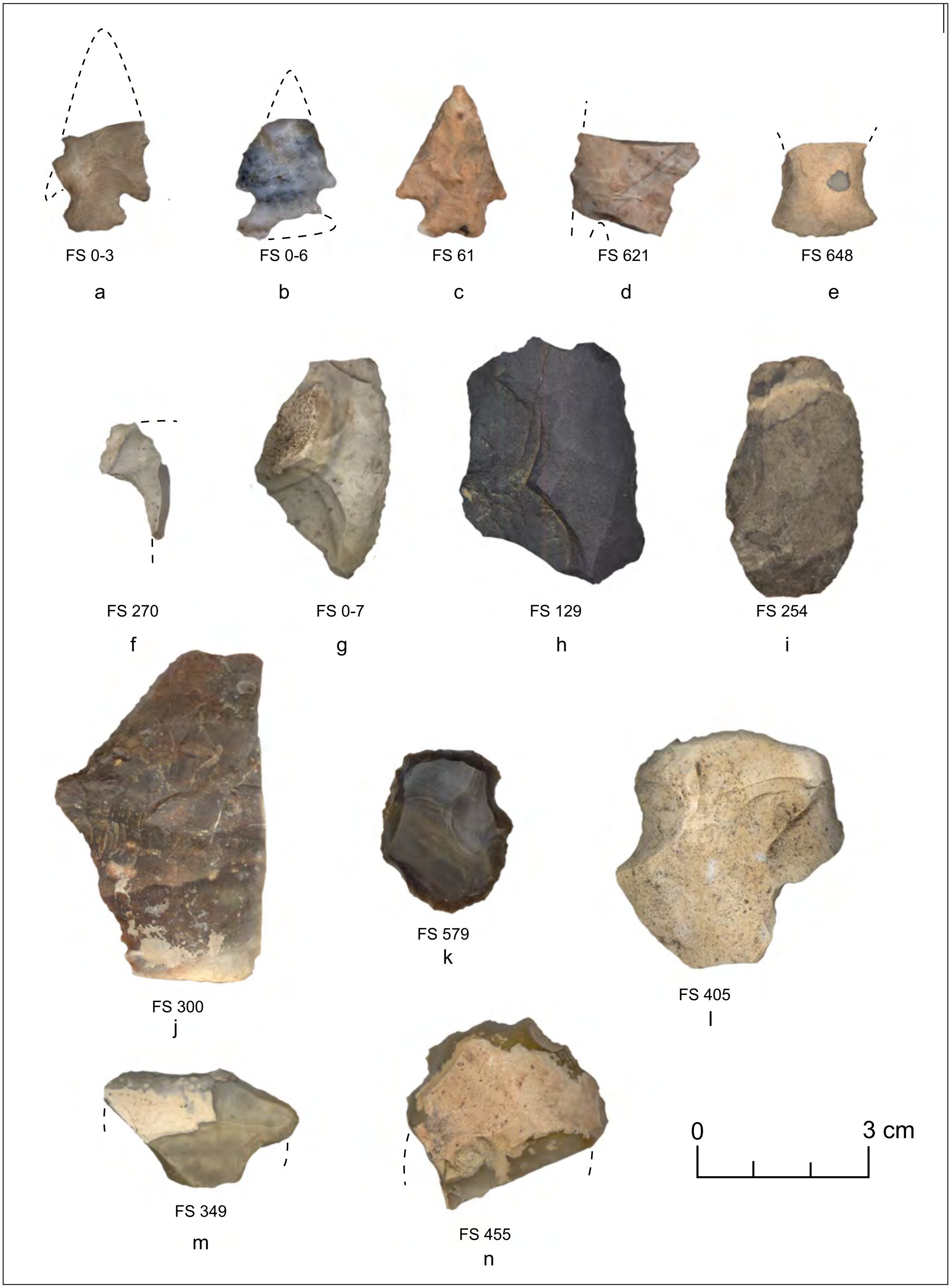

Figure 40. LA 54347: projectile points (a-e), drill (f), scrapers (g-l), uniface (m), and graver (n).

Table 15. LA 54347: flake-tool edge types by use/retouch type.

	Use-wear	Intentional Retouch	Combination Use-Wear and Intentional Retouch	Total
Unifacial				
straight	9	2	1	12
convex	1	1	-	2
concave	2	-	-	2
irregular	3	1	-	4
Total	15	4	1	20

Flake tools (n=17). The 17 items had 20 individual edges (Table 15). Number of edges per flake varies as follows: one edge, n=14, 82% of flake tools; two edges, n=3, 18% of flake tools. All are unifacial edges; there are no bifacial edges, notches, or projections. Use-worn edges (n=15, 75% of individual edges) are the most common, followed by intentionally retouched edges (n=4, 20% of edges), and both use-worn and intentionally retouched edges (n=1, 5% of edges).

Local gray cherts dominate (n=9, 53% of flake tools), followed closely by other cherts (tan chert in this case, n=7, 41% of flake tools). The only other material is a fine, brown siltite or quartzite (n=1, 6% of flake tools).

The 17 flake tools constitute 1.5% of the lithic debitage sample from LA 54347. As an artifact class, the flake tools are distributed fairly evenly across the site; only half come from the main artifact concentration.

Graver (n=1). FS 455 is a flake fragment with steep retouch along one edge. A single projection, apparently by design, is in the middle of the edge (see Fig. 40). Dimensions: 28+ by 33+ by 9 mm. Material: medium gray chert with orange cortex; probably heat-treated. This material does not respond to ultraviolet light. Provenience: surface of square 12S 2E.

Scrapers (n=6). Although these items vary in size, shape, and details (see Fig. 40), they are similar in that they are flakes with the scraping edges being the only modification. None can be classified as typical Plains style end-scrapers.

FS 0-7 is a side-scraper with one long edge that has been steeply, unifacially retouched. Dimensions: 39 by 24 by 9 mm. Material: light grayish brown, light brown, and off-white chert. Provenience: surface, square uncertain.

FS 129 has a finely, steeply retouched edge. Dimensions: 44 by 33 by 15 mm; weight 23.2 g. Material: black basalt. Provenience: surface of square 14S 48E.

FS 254 is technically classifiable as an end-and-side-scraper. However, the flake scars on the scraping edges are so small that we cannot be certain whether they are the result of use-wear or intentional retouch. Dimensions: 42 by 25 by 4.5 mm; weight 5.5 g. Material: mottled medium grayish brown and off-white chert; may be heat-treated. Provenience: surface of square 32S 14E.

FS 300 has a shape reminiscent of a Cody knife, but it is not one. The only modification to this large flake is intentional retouch along one edge. Dimensions: 58+ by 38 by 11 mm; weight 22.9 g. Material: mottled light, medium, and dark gray chert. Provenience: surface of square 44S 6E.

FS 405 is a flake with one finely retouched edge. Dimensions: 41 by 39 by 8 mm; weight 16.3 g. Material: tan and light gray chert. Provenience: surface of square 40S 20E.

FS 579 can be characterized as a double side-scraper with both scraping edges being markedly convex. Dimensions: 29 by 23 by 6 mm; weight 5.5 g. Material: dark grayish brown silicified wood; may be heat-treated. Provenience: surface of square 8N 0.

Recreational, Ornamental or Ceremonial Artifacts

FS 0-2 is a roughly spherical mass or "rose" of octagonal quartz crystals known locally as "Pecos Valley Diamonds." They occur naturally as single (double-terminated) and twinned crystals in sandy surface exposures immediately east of the Pecos River and some 20 km east of the White Paint site. Dimensions: 25 by 24 by 19 mm. Provenience: surface of square 6S 20E.

Miscellaneous Artifacts

FS 349 is a flake fragment (uniface) that can be classified as either a scraper or as a retouch practice piece (see Fig. 40). The steep, intentional retouch does not extend along the entire edge; discontinuation of the retouch left an irregularity in the edge that would have presented problems if the retouched part was to be used as a scraper. Dimensions: 20+ by 35 by 7 mm. Material: light to medium grayish brown chert. Provenience: surface of 18S 52E.

Manufacturing Debris

All of the manufacturing debris recovered from LA 54347 was generated by the production of chipped stone artifacts. In addition to cores, flakes, and other detritus, manufacture rejects and failures of various sorts are included in this section.

Some of the items in this section would appear with the descriptions of the formal, finished artifacts in the more traditional archaeological reports. The reasons for their appearance here are discussed in Chapter 6.

Bifaces

Roughouts (early-stage bifaces) (n=13). As is typical of this artifact category, the LA 54347 specimens display a range of shapes and sizes (Fig. 41). The complete specimens (n=6) range from 41 to 60 mm long, from 29 to 38 mm wide, from 11.5 to 17 mm thick, and from 15.0 to 30.1 g in weight.

FS 0-1 is a thick, blocky piece of material on which bifacial thinning has been attempted. Dimensions: 25+ by 21+ by 11 mm. Material: possibly Tecovas chert. Provenience: surface of square 7S 8E.

FS 0-4 was probably discarded because of thinning problems. Dimensions: 46 by 29 by 11.5 mm; weight 15.0 g. Material: indurated, medium dark grayish brown siltite. Provenience: surface of square 12S 34E.

FS 0-5 is approximately half of the original artifact. Dimensions: 33+ by 33+ by 8+ mm. Material: mottled light grayish brown and dark grayish brown chert. Provenience: surface of square 2N 36E.

FS 145 is complete. Dimensions: 41 by 31 by 13 mm; weight 16.3 g. Material: light tan and light gray chert. Provenience: surface of square 18S 50E.

FS 254 is about half complete. Dimensions: 33+ by 34+ by 13+ mm. Material: tan and gray fingerprint chert (not fingerprint throughout). Provenience: surface of square 32S 14E.

FS 303 is complete but of poor-quality material. Dimensions: 60 by 36 by 17 mm; weight 30.1 g. Material: light gray and tannish brown chert/limey chert. Provenience: surface of square 44N 18E.

FS 310 is about half complete. Dimensions: 52+ by 39+ by 13+ mm. Material: tan limey chert with occasional medium gray mottles. Provenience: surface of square 46S 8E.

FS 319 lacks one lateral edge. Dimensions: 59 by 36+ by 12 mm. Material: striped and mottled, light to dark tan to gray chert. Provenience: surface of square 48S 26E.

FS 415 may be complete. Dimensions: 40 by 34 by 10 mm; weight 14.9 g. Material: mottled, light grayish brown to medium and dark gray chert. Provenience: surface of square 6N 10E.

FS 434 is complete. Dimensions: 59 by 31 by 16 mm; weight 28.4 g. Material: very coarse, burned orange and gray limey chert/siltstone. Provenience: surface of square 8N 20E.

FS 443 is complete. Dimensions: 47 by 38 by 15 mm.; weight 26.1 g. Material: coarse, tan to light orange chert. Provenience: surface of square 10N 2E.

FS 475 is complete. Dimensions: 42 by 31 by 13.5 mm; weight 15.4 g. Material: fingerprint chert that is tan and gray on the exterior but white and gray on fresh breaks. Provenience: surface of square 14N 22E.

FS 664 is half to two-thirds complete. Dimensions: 30+ by 21+ by 10+ mm. Material: mottled light and dark gray chert. Provenience: surface of square 24S 48E.

Miscellaneous small bifaces (n=1). Small bifaces are finely retouched, relatively well-shaped items (teardrop to oval) that differ from large bifaces primarily in size (Fig. 42). They differ from roughouts in that roughouts are roughly chipped (relatively few flakes removed) and not of a standard shape other than being generally lozenge-shaped. Small bifaces may be either finished tools in their own right (knives), or they may be late-stage preforms in the process of projectile point (possibly arrow) manufacture.

FS 625 is about two-thirds complete and consists of the base and most of one lateral edge. Dimensions: 25+ by 19+ by 5+ mm. Material: mottled off-white, light brownish gray, and dark brownish gray chert; probably heat-treated. Provenience: surface of square 20N 6W.

Miscellaneous large bifaces (n=10). The same description applies as given above for miscellaneous small bifaces, except that these items are appreciably larger (Fig. 42).

FS 42 is a small, lateral-edge fragment. Dimensions: 13+ by 12+ by 4+ mm. Material: medium brownish gray chert. Long-wave ultraviolet light response is dark orange-red. Provenience: surface of square 4S 24E.

FS 76 is a small edge fragment from the lateral edge/base area of the biface. Dimensions: 20+ by 20+ by 6+ mm. Material: medium gray and red chert; possibly heat-treated. Provenience: surface of square 8S 26E.

FS 112 is a small edge fragment from the lateral edge/base area. Dimensions: 20+ by 10+ by 5+ mm. Material: medium to dark grayish brown and gray chert; heat-treated (lustrous). Provenience: surface of square 12S 40E.

FS 143 is a basal fragment. Dimensions: 17+ by 27+ by 6+ mm. Material: tan and light to medium gray and black chert; heat-treated. Provenience: surface of square 18S 4E.

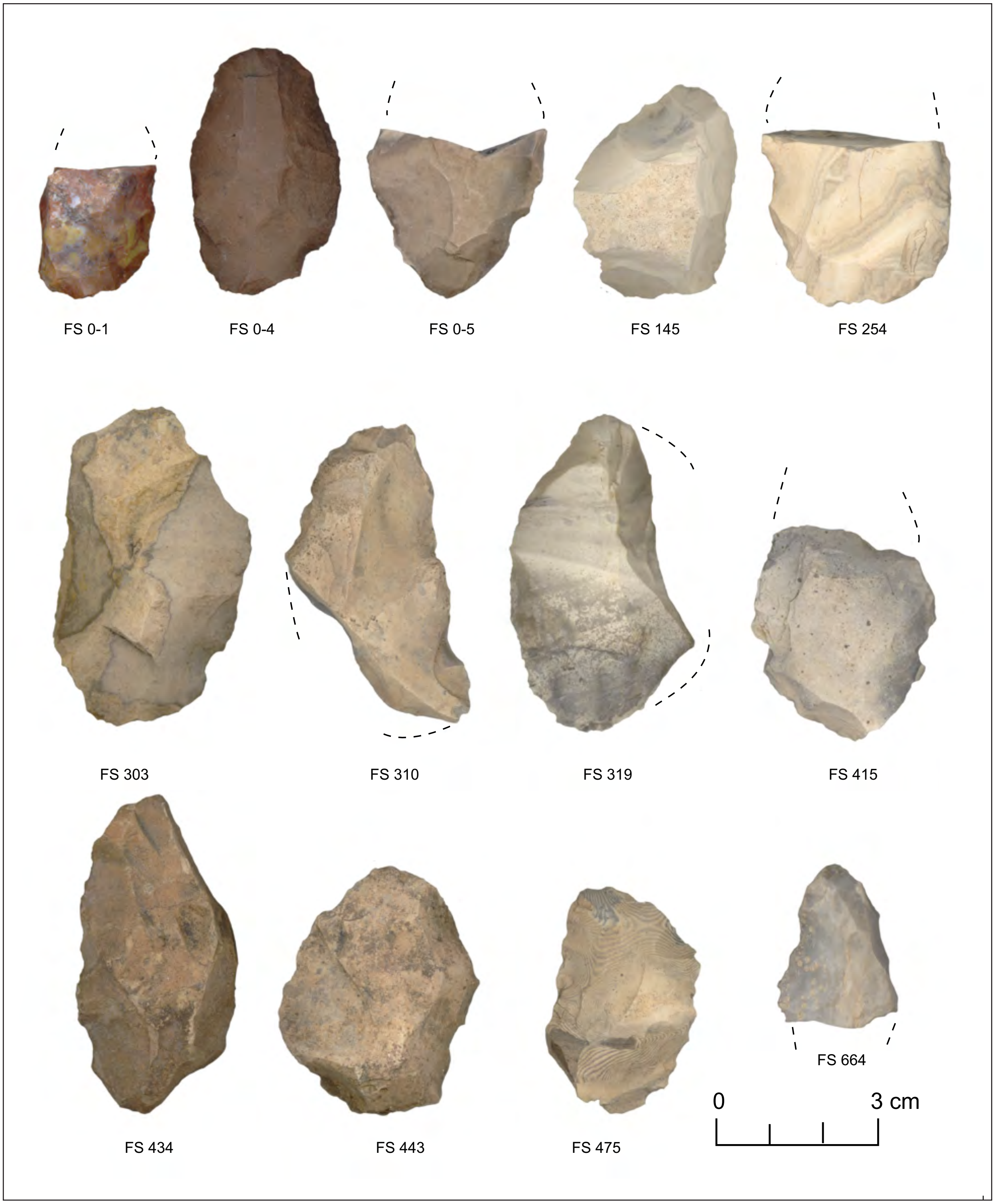

Figure 41. LA 54347: roughouts (early-stage bifaces).

FS 150 is a basal edge fragment. Dimensions: 7+ by 20+ by 4+ mm. Material: dark gray chert; heat treated (very lustrous). Provenience: surface of square 18S 38E.

FS 171 is a lateral edge fragment. Dimensions: 23+ by 10+ by 4+ mm. Material: light grayish brown chert. Provenience: surface of square 22S 6E.

FS 184 is the basal half of the biface. Dimensions: 24+ by 30+ by 6.5 mm. Material: mottled off-white and gray chert; one face browner colored, possibly because of greater weathering. Provenience: surface of square 22S 44E.

FS 413 is a lateral edge fragment. Dimensions: 16+ by 25+ by 5 mm. Material: medium brown chert. Provenience: surface of square 6N 2E.

FS 617 is a lateral edge fragment. Dimensions: 27+ by 27+ by 8.5 mm. Material: medium brownish gray chert; heat-treated. Provenience: surface of square 4S 6W.

FS 637 is the lower one-half to two-thirds of the biface. Dimensions: 25+ by 25+ by 5 mm. Material: mottled medium and dark brown and gray chert; heat-treated. Provenience: surface of square 8S 10W.

Lithic Knapping Debris

Lithic manufacture debris—cores, flakes, shatter, and pieces of material—constitutes the bulk of the lithic materials recovered from LA 54347 (Table 16). The raw materials and definitions used to classify and analyze chipped lithic debris are described in Appendix 8. The local gray chert sourcing study is described in Wiseman 2000a and 2002.

The cores, core-reduction flakes, biface thinning flakes, and exotic materials are described below. Pieces of debitage bearing use-wear or intentional retouch are described in the section on tools.

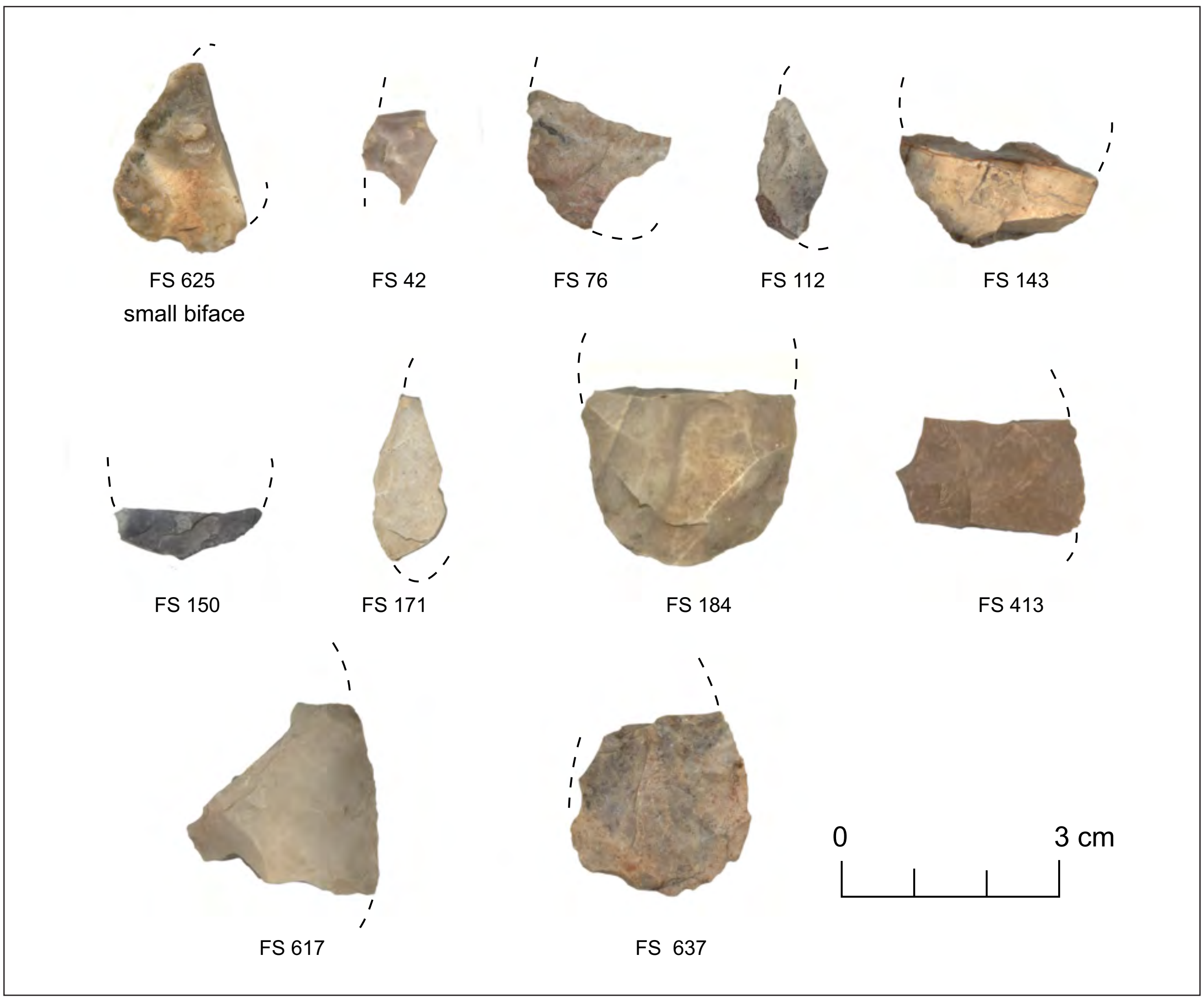

Figure 42. LA 54347: miscellaneous small biface (FS 625) and miscellaneous large bifaces (all except FS 625).

Cores (n=112). The 112 cores include six subtypes and one residual category (Table 16). The single-platform core is the most common, followed by the flake core and the two-platforms-adjacent core. Materials are dominated by other cherts, followed by local gray cherts (Table 17).

Sizes vary greatly—flake cores being the smallest and tested cobbles/pebbles being the largest (Table 18)—but no linear progression from large and simple to small and complex is evident.

Table 16. LA 54347: summary of lithic manufacture debris.

Manufacture Debris Category	Number	Percent
Cores	112	10%
single platform	31	3%
two platforms adjacent	20	2%
two platforms parallel	7	1%
three platforms	11	1%
tested cobble/pebble	4	<1%
flake core	27	2%
indeterminate	12	1%
Flakes	911	81%
core reduction	864	77%
decortication	5	<1%
platform rejuvenation, side	1	<1%
biface thinning	12	1%
potlid	1	<1%
indeterminate	28	3%
Shatter	83	7%
Pieces of material[1]	12	1%
Total	1118	100%

[1]Unworked raw material imported into site by humans.

Correlation statistics of core size and weight indicate relatively low standardization of core dimensions for all cores as a group (Table 19). No core subtype shows consistently high correlations for all pairings. At first glance, the two-platforms-parallel core seems to be the exception, but because of small class size (n=7), only the thickness–weight pairing is significant at the .001 level. Among most core subtypes, two pairings are consistently strong: length–weight and width–weight.

Given that standardizations of dimensions are probably imposed partly by the natural geometry of the pieces of material, correlation coefficients in the .8000s and .9000s are considered potentially significant from a cultural standpoint, whereas those in the .7000s and .6000s are less so. We should also not overlook the probability that the knappers were selecting for the blockier (as opposed to more tabular) pieces of material in the first place. And, to a degree, the smaller cores may have higher correlations simply because some of them were reduced to their smallest possible size and discarded.

Only 1.8% of the cores showed evidence of intentional heat-treatment. With another 2.7% of possibly heat-treated specimens, the total may be as much as 4.5% (Table 17). These figures essentially match the average for the lithic debris assemblage as a whole.

Core-reduction flakes (n=864). Less than a quarter of the 864 core-reduction flakes are complete. Summary statistics (Table 20) indicate that, on average, they are small and modest in weight (6 to 7 g).

A Pearson correlation matrix (Table 20) indicates that the flake dimensions are not strongly correlated—all values are in the .7000s or lower. We feel that this clearly indicates a general lack of standardization of flake shapes, even though the actual statistics assign a 2-tailed significance of .001 to all correlations. Our judge-

Table 17. LA 54347: summary observations on certain lithic debitage classes.

	Cores		Flakes: Core Reduction		Flakes: Biface Thinning		Flakes: Other		Shatter and Other		Site Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Materials												
local chert	40	35.7%	313	36.2%	6	50.0%	16	45.7%	47	49.5%	422	37.7%
other chert	58	51.8%	407	47.1%	6	50.0%	14	40.0%	40	42.1%	525	47.0%
chalcedonies	4	3.6%	39	4.5%	-	-	4	11.4%	3	3.2%	50	4.5%
siltites/quartzites	5	4.5%	44	5.1%	-	-	-	-	2	2.1%	51	4.6%
other	5	4.5%	61	7.1%	-	-	1	2.9%	3	3.2%	70	6.3%
total	112	100.0%	864	100.0%	12	100.0%	35	100.0%	95	100.0%	1118	100.0%
Heat-treated												
no	95	84.8%	719	83.2%	4	33.3%	25	71.4%	74	77.9%	917	82.0%
yes	2	1.8%	38	4.4%	2	16.7%	2	5.7%	4	4.2%	48	4.3%
possibly	3	2.7%	26	3.0%	-	-	3	8.6%	7	7.4%	39	3.5%
indeterminate	12	10.7%	81	9.4%	6	50.0%	5	14.3%	10	10.5%	114	10.2%
totals	112	100.0%	864	100.0%	12	100.0%	35	100.0%	95	100.0%	1118	100.0%

Table 18. LA 54347: summary of complete core dimensions.

Core Type	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
All cores (n=99)				
mean	43.47	33.70	19.95	43.57
SD	14.18	9.99	7.72	67.89
range	79.0	55.0	39.0	442.9
Single platform (n=31)				
mean	42.52	33.77	22.06	61.23
SD	18.27	12.69	8.04	103.89
range	79.0	55.0	34.0	441.6
Two platforms adjacent (n=20)				
mean	42.05	33.90	22.00	35.50
SD	8.12	8.61	5.52	21.95
range	29.0	31.0	22.0	77.1
Two platforms parallel (n=7)				
mean	47.14	32.57	22.14	57.64
SD	20.38	9.95	11.16	96.62
range	61.0	28.0	33.0	268.8
Three platforms (n=11)				
mean	44.27	36.18	22.45	39.29
SD	8.25	7.31	5.16	17.79
range	22.0	23.0	15.0	52.2
Tested cobble/pebble (n=4)				
mean	60.00	41.25	22.75	81.43
SD	17.80	3.10	9.46	67.38
range	42.0	7.0	21.0	150.2

Table 19. LA 54347: correlation matrix of core dimensions.[1]

Core Type	Length	Width	Thickness	Weight
All cores (n=99)				
length	1.0000			
width	.8314	1.0000		
thickness	.7015	.6554	1.0000	
weight	.8615	.7210	.7253	1.0000
Single platform (n=31)				
length	1.0000			
width	.8820	1.0000		
thickness	.7084	.7709	1.0000	
weight	.8914	.8044	.7926	1.0000
Two platforms adjacent (n=20)				
length	1.0000			
width	.8458	1.0000		
thickness	.6616*	.6270*	1.0000	
weight	.6602*	.6706*	.5787*	1.0000
Two platforms parallel (n=7)				
length	1.0000			
width	.8712	1.0000		
thickness	.9222*	.8942*	1.0000	
weight	.9402*	.9210*	.9618	1.0000
Three platforms (n=11)				
length	1.0000			
width	.8473	1.0000		
thickness	.2879**	.0824**	1.0000	
weight	.8621	.8279*	.5752**	1.0000
Tested cobble/pebble (n=4)	not computed—sample size too small			

[1]Pearson's r, 2-tailed test; significant at the .001 level unless otherwise specified.

*Significant at the .01 level.

**Not significant.

Table 20. LA 54347: summary statistics of complete core-reduction flakes.

n=201	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
Descriptive statistics				
mean	25.13	21.80	7.61	6.27
SD	11.81	9.83	4.48	9.82
range	61.0	71.0	39.0	73.4
Correlation matrix of dimensions				
length	1.0000			
width	.6889	1.0000		
thickness	.7297	.5818	1.0000	
weight	.7915	.7873	.6964	1.0000

ment is based on the fact that in other studies the values have been higher overall.

Other characteristics of the core-reduction flakes include the following (Tables 17 and 21). The primary materials are other cherts, followed by local gray cherts (same as for cores). Heat-treatment was uncommonly used—the total positive and "possible" cases total less than 7.5%. Interestingly, heat-treated *complete* core-reduction flakes (i.e., less than one-fourth of the total core-reduction flakes) constitute nearly 12%.

Single-flake-scar platforms are the most common, and account for one-third of the flakes. Cortex platforms and multi-flake-scar-platforms are also well represented. Well over half of the flakes have feathered or modified-feathered terminations. Just over one-third are hinged or stepped.

The dorsal cortex profile is peculiar. The majority of complete flakes lack dorsal cortex, which is common. The peculiarity is that only 7% have small amounts (1 to 10%) of dorsal cortex. However, if the 1-to-10% group is combined with the 11-to-25% group to make the combined group equivalent in size to the 26-to-50% and 51-to-75% groups, the "normal" profile of highest to lowest from left to right is restored.

Biface-thinning flakes (n=12). That only 12 biface-thinning flakes were recovered is to be expected given the method of collection (surface collection—i.e., limited excavation). Three are of local cherts, and three are of other cherts (see Table 17).

Exotic lithic materials (n=7). Materials originating from sources outside southeastern New Mexico are rare (0.6%) in the debitage assemblage from LA 54347: one Alibates dolomite (from 21S 46E), one possible Alibates (22S 49E), one Edwards chert (2N 12E), one possible Edwards chert (28S 80E), and three Alibates/Tecovas lookalikes (46S 6E, 46S 6E, 26S 40E). All are small core-reduction flakes and flake fragments, with weights of 1.4, 0.3, 0.2, 2.5, 0.2, 0.5, and 0.6 g, respectively.

Overall, their proveniences are widely scattered. However, the Alibates (21S 46E) and possible Alibates (22S 49E) flakes were close together, and lay on either side (east and west) of Feature 1, the excavated hearth. One of the Alibates/Tecovas lookalikes lay about 9 m south of the same hearth, and two Alibates/Tecovas lookalikes came from the same 2-by-2-m surface-excavated square at 46S 6E.

Gray cherts (n=1,037). The gray chert flakes in the analysis sample from LA 54347 were subjected to the bulk debitage UV analysis described in Wiseman (2000a and 2002). The results for LA 54347 (see Fig. 30) show very low responses overall. The actual figures for the 1,037 analyzed items are 91% no response, 7% low response, and 2% medium response. These figures group LA 54347 with the main group of sites analyzed to date: Los Molinos, White Paint, The Camp, River Camp, Corn Camp, and La Cresta (see discussion in Chapter 6).

Table 21. LA 54347: summary of selected observations on core-reduction flakes.

Attribute	Number	Percent
Platform types		
cortex	42	21%
single flake scar	76	37%
multiple flake scars	38	19%
pseudodihedral	2	1%
edge or ridge-like remnant	28	14%
destroyed during detachment	13	6%
indeterminate	4	<1%
total	203	100%
Distal termination type		
feathered	51	25%
modified feathered	76	38%
hinged or stepped	74	37%
total	201	100%
Dorsal cortex		
0%	95	47%
1-10%	14	7%
11-25%	29	14%
26-50%	27	13%
51-75%	20	10%
76-90%	3	1%
91-99%	9	4%
100%, including platform	4	2%
total	201	100%

CHAPTER 9

LA 68185—Sitio Largo

Site Description

LA 68185 was described by the OAS survey archaeologist as a large camp with widespread lithics, burned rocks, and six hearths (Wiseman 1989, 1992). Site size was estimated as 100 m north-south by 250 m east-west. Auger tests and limited trowel probes during a testing phase indicated that the site was essentially surficial and that the tested hearths were highly disturbed. Artifacts from various points across the site suggest occupations during the Middle Archaic, Late Archaic, and historic periods.

The site is situated on the north slope and crest of the south terrace along the South Berrendo River, a formerly perennial, artesian-spring-fed stream (Fig. 43). The White Paint site (LA 54347) is directly across the Berrendo; elevation is 3,629 feet (1,106 m) above mean sea level.

Field Activities

This site was treated primarily during the survey and testing phases of the project. Although the data recovery plan (third phase) called for the excavation of a hearth, that hearth was covered by flood sediments prior to the field work, could not be relocated, and was not excavated. Certain artifacts recovered during the testing phase and during a subsequent survey phase by Lone Mountain Archaeological Services, Inc. (Flynn and Travis-Suhay 1996) are of interest and worth inclusion here.

Artifacts

A number of formal artifacts representing the Middle Archaic, Late Archaic, and historic periods were recovered from the site surface by the OAS and by Lone Mountain Archaeological Services, Inc. All of them have been briefly described and illustrated in earlier planning documents that have very limited distribution (Flynn and Travis-Suhay 1996; Wiseman 1989, 1992). They are described again here in somewhat greater detail to make information about them more widely available.

Plant-Food-Related Artifacts

Two small one-hand manos are characteristic of the region (Fig. 44). Neither cobble is modified beyond the grinding surface. FS 0-7 has an irregular rectangular shape and only a trace of use-wear on the grinding surface. A reddish tinge indicates burning. Dimensions: 106 by 87 by 39 mm. Material: sandstone. Provenience: site surface. FS 0-12 is oval with one fairly well-developed grinding surface. Dimensions: 123 by 80 by 41 mm. Material: tan to gray, slightly vesicular sandstone. Provenience: site surface.

Hunting-Related Artifacts

Projectile points. The styles of the six projectile points represent a wide range of shapes and time periods (Fig. 45).

FS 0-1 has an irregular, corner-notched shape. It is complete except for the tip. Dimensions: 26+ by 21 by 5 mm. Neck width: 11 mm. Material: red chalcedonic chert. Provenience: site surface.

FS 0-3 is most similar to the Godley point of Texas and the Large San Pedro point of the Southwestern Cochise. It is complete except for the tip and part of the base. Dimensions: 39+ by 21 by 6.5 mm. Neck width: 14.5 mm. Material: black quartzite. Provenience: site surface.

FS 0-9, with its corner-notching and indented base, is most similar to the Frio point of Texas, but less so to the side-notched Chiricahua point of the Southwestern Cochise. It lacks the tip and ends of both “ears” of the base. Dimensions: 16+ by 17.5+ by 4.5 mm. Neck width: 12.5 mm. Material: mottled rose, red, and gray chalcedonic chert (vague Alibates lookalike). Provenience: site surface.

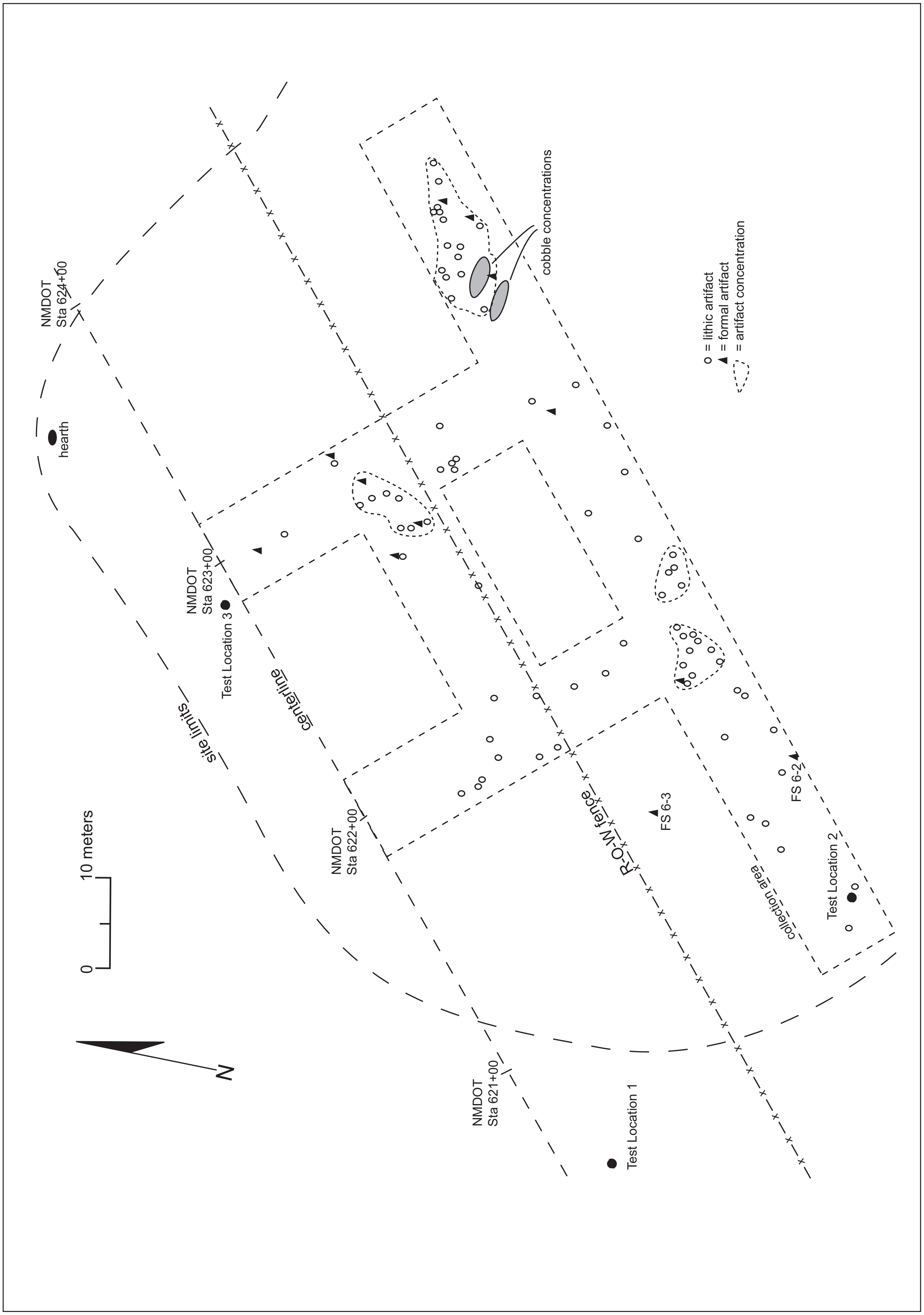

Figure 43. LA 68185: site map.

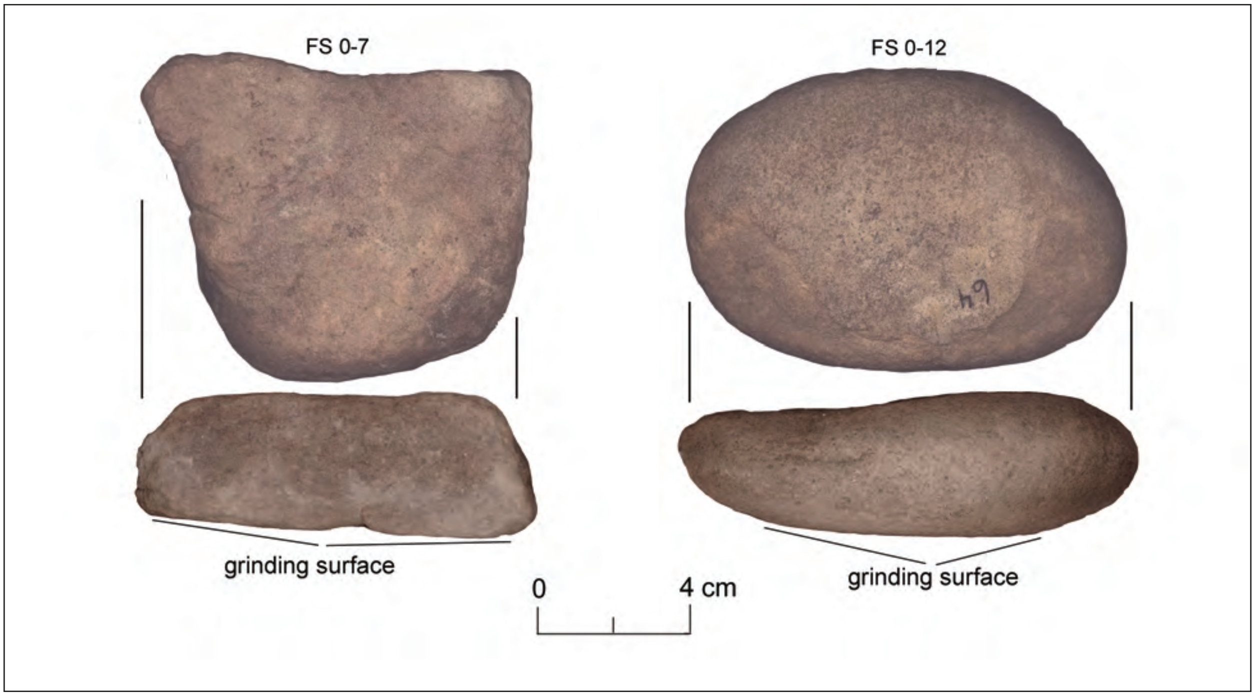

Figure 44. LA 68185: manos.

FS 0-13 has a narrow stem and a wide, heavily reworked/unfinished blade that appears to have broken during thinning. The tip and one end of an "ear" on the base are missing. Dimensions: 32+ by 21 by 7.5 mm. Stem width: 11 mm. Material: good-quality gray chert with occasional imperfections that led to the thinning problems. Provenience: site surface.

FS 0-14, though fragmentary, appears to have been most similar to the Marshall point of Texas. The base/stem and part of the blade are present. Dimensions: 25+ by 26+ by 6+ mm. Neck width: 18.5 mm. Material: off-white, light gray, and medium gray chert with numerous tiny vugs. Provenience: site surface.

The last point is a metal arrowhead (Fig. 46) found by Lone Mountain Archaeological Services, Inc. during their survey of a borrow pit for the relief route. This specimen has rounded shoulders and a serrated-edge stem. Dimensions (scaled from silhouette in Flynn and Travis-Suhay 1996): 51 by 20.5 by 3.5 mm. Material: metal of undetermined composition. Provenience: surface at east end of site, well outside the highway right-of-way.

Hide-scrapers. Two classic Plains end-scrapers were recovered (Fig. 45). FS 0-5 is the distal end or steep working edge of the scraper. Dimensions: 20+ by 26 by 7+ mm. Material: high-quality fingerprint chert. Provenience: site surface.

FS 0-15 is complete; both lateral edges are finely chipped to a teardrop shape. Dimensions: 41 by 22 by 8.5 mm. Weight 7.8 g. Material: Alibates chert (agatized dolomite). Provenience: site surface.

Manufacturing Tools

Flake tool. The one flake tool has a single concave edge with 14 mm of unifacial use-wear. This core-reduction flake is made of local gray chert, and weighs 13.2 g.

Graver. FS 0-19 is a thick flake with intentional retouch along one steep edge that delimits a projection or graver-like point (Fig. 44). Dimensions: 28 by 31 by 11 mm. Weight: 11.2 g. Material: medium grayish brown chert. Provenience: site surface.

Spokeshave. FS 0-6 is a thick flake fragment with a broad, shallow notch intentionally flaked into a steep edge (Fig. 44). Dimensions: 27 by 26 by 13 mm. Notch: 14 mm across, 3.5 mm deep. Material: off-white, tan, light gray, and dark gray banded cherty material. Provenience: site surface.

Miscellaneous Tools

Uniface. FS 0-17 is a very thick flake with a steeply flaked lateral edge (Fig. 45). It is so thick and short that holding it in the hand to perform scraping tasks appears difficult, especially if a strong pull was required. Dimensions: 47 by 31 by 17 mm. Weight: 26.3 g.

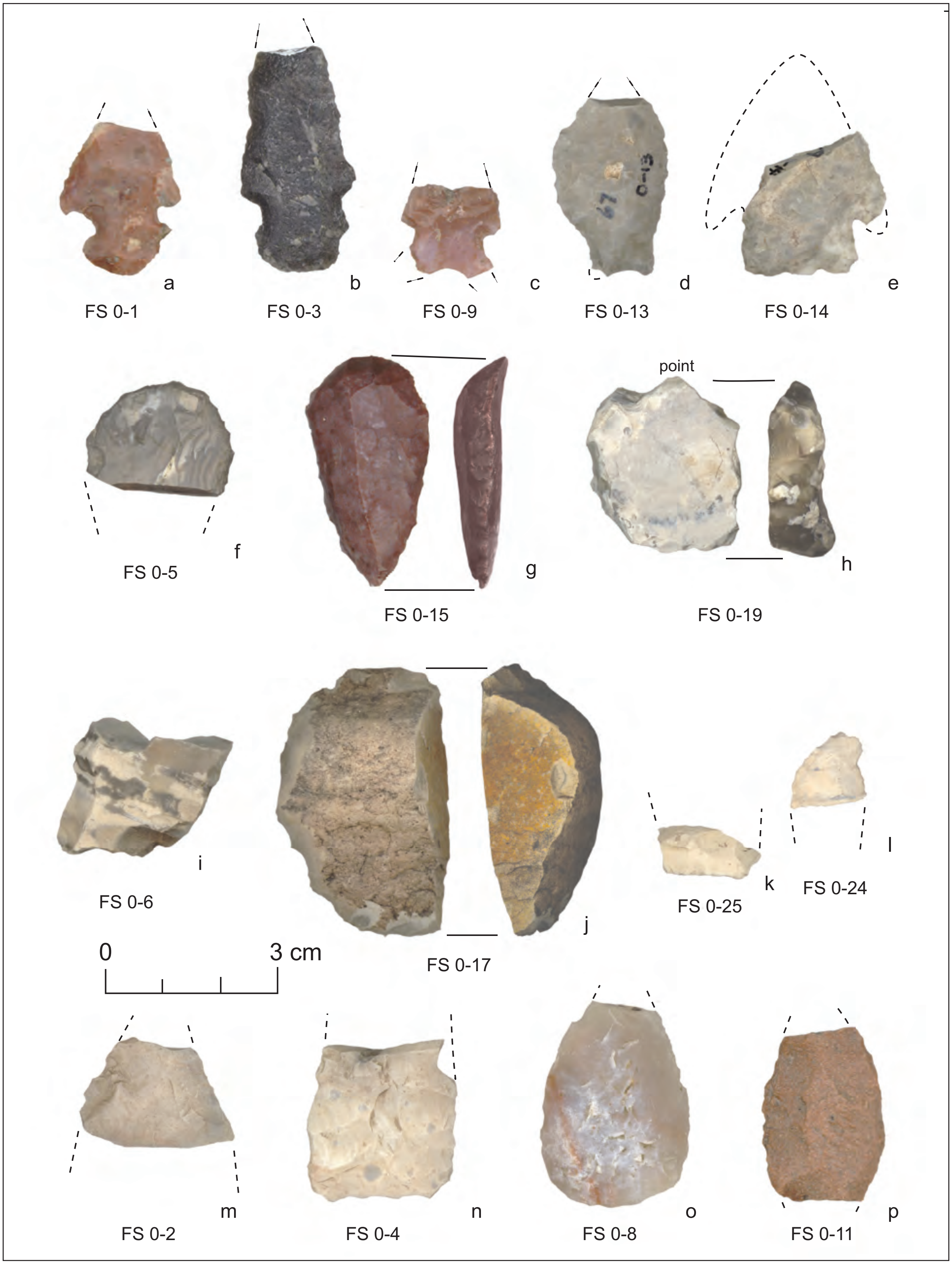

Figure 45. LA 68185: (a-e) projectile points, (f-h) gravers, (i) spokeshave, (j) uniface, (k) roughout, (l) small biface, (m-p) large bifaces.

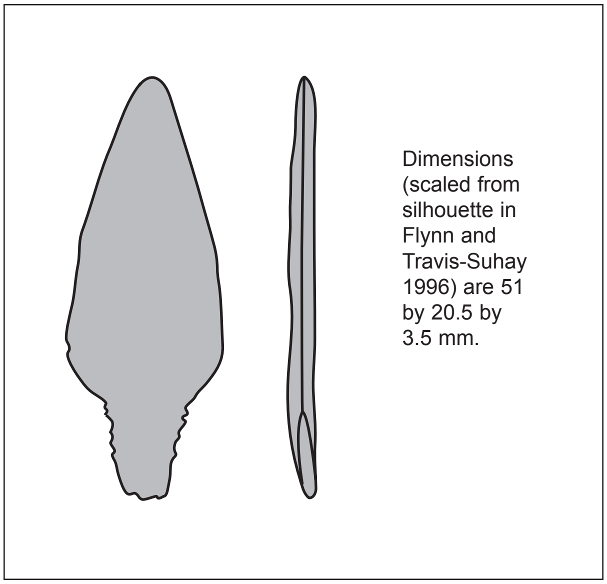

Figure 46. LA 68185: metal arrow point (surface find by Lone Mountain Archaeological Services).

Material: tan and gray chert with dark gray/black speckles. Provenience: site surface.

CHIPPED STONE MANUFACTURING DEBRIS

The knapping debris described below cannot in any way be considered typical of this category of items from LA 68185. As mentioned earlier, this site has been severely depleted of artifacts by collectors, and the artifacts described here represent only those remaining on the site surface which fell within the limited test-sample area. As will be seen, few total items were collected.

Some of the artifacts described in this section would normally appear with the descriptions of the formal, finished artifacts in the more traditional archaeological reports. But because the author believes that many, if not most, even all generalized bifaces represent interrupted (though not necessarily unplanned) and now de facto terminated steps during manufacture, they are more properly described in this section. By taking this course, we get a better idea of how much tool manufacturing was taking place at the site versus the other daily tasks involving the formal, finished artifacts.

Bifaces

Six fragmentary bifaces represent three categories: roughouts, large, and small.

Roughout (n=1). FS 0-25 is the basal edge of a thick, roughly flaked biface (see Fig. 45). Dimensions: 8.5+ by 19+ by 9+ mm. Material: tan cherty material. Provenience: site surface.

Small biface (n=1). FS 0-24 is the tip of a small, thin biface, possibly an arrow-point preform (see Fig. 45). It apparently snapped off during final thinning and shaping. Dimensions: 12.5+ by 13+ by 2.5+ mm. Material: tan cherty material with gray mottling. Provenience: site surface.

Large bifaces (n=4). FS 0-2 (see Fig. 45) is a fragment from near the tip. Dimensions: 19+ by 26+ by 4+ mm. Material: tannish gray chert with hematite speckles; possibly heat-treated. Provenience: site surface.

FS 0-4 is part of a very large biface with fine, shallow, large flake scars reminiscent of Paleoindian workmanship. Dimensions: 28+ by 26 by 4 mm. Material: tan to gray chert with gray mottles. Provenience: site surface.

FS 0-8 lacks only the tip, which was clearly broken during thinning. Dimensions: 34+ by 26 by 6.5 mm. Material: light gray chalcedony with red stripe or "ribbon." Provenience: site surface.

FS 0-11 lacks both the tip and the base. Dimensions: 31+ by 22 by 7 mm. Material: coarse orange quartzite. Provenience: site surface.

Knapping Debris

Lithic manufacture debris—cores, flakes, shatter, and pieces of material—constitutes the bulk of the lithic materials recovered from LA 68185 (Table 22). The analysis of these materials, following the standard analysis used by the author in the Roswell region over the past 20 years, focuses on reconstructing the lithic technology and the identification of materials and

Table 22. LA 68185: summary of lithic manufacture debris.

Manufacture Debris Category	Number	Percent
Cores	7	10%
single platform	3	4%
two platforms adjacent	1	1%
tested cobble/pebble	1	1%
indeterminate	2	3%
Flakes	58	82%
core reduction	56	79%
indeterminate	2	3%
Shatter	5	7%
Pieces of material[1]	1	1%
Total	71	100%

[1]Unworked raw material imported into site by humans.

sources. The results presented here are somewhat abbreviated because of the small sample size. The raw materials and definitions used to classify and analyze chipped lithic debris are described in Appendix 8.

The cores, core-reduction flakes, and exotic materials are described below. Pieces of debitage bearing use-wear or intentional retouch are described in the section on tools.

Cores (n=7). The seven cores include four subtypes (Table 22). The single-platform core is the most common. Materials are varied but are dominated by the other chert category (Table 23). Sizes vary somewhat (Table 24), but all are small. The smallest core measures 39 by 36 by 21 mm and weighs 9.5 g. The largest measures 73 by 62 by 33 m and weighs 184.7 g. Only one core shows evidence of possible heat-treatment.

Core-reduction flakes (n=56). Only 11 of the 56 core-reduction flakes are complete; summary statistics (Table 25) indicate that, on average, they are small and light in weight (1 to 2 g). Material type is an equal mix of local gray cherts and other cherts. Heat treatment was rarely used: the total positive and possible cases total only 7%. This figure may be misleading because 45% are scored as indeterminate.

Multiflake-scar platforms are the most common, accounting for 40% of the flakes (Table 26). The majority (64%) of terminations are modified-feathered; feathered and modified-feathered terminations constitute an unusually high 78% for the Roswell region. This means that the failure rate, indicated by hinged and stepped terminations, is comparatively low at 23%. The dorsal cortex profile is unusual in its evenness through the 0 to 50% values, but this could be a reflection of small sample size (n=11).

The debitage sample from LA 68185 was not subjected to the bulk debitage UV analysis described in Wiseman (2000a and 2002) because the sample is too small to be meaningful.

Table 23. LA 68185: summary observations on certain lithic debitage classes.

			Flakes							
	Cores		Core Reduction		Other		Shatter and Other		Site Total	
	n	%	n	%	n	%	n	%	n	%
Materials										
local chert	2	28.6%	26	46.4%	1	50.0%	3	50.0%	32	45.1%
other chert	4	57.1%	24	42.9%	1	50.0%	2	33.3%	31	43.7%
chalcedonies	-	-	4	7.1%	-	-	1	16.7%	5	7.0%
other	1	14.3%	2	3.6%	-	-		0.0%	3	4.2%
total	7	100.0%	56	100.0%	2	100.0%	6	100.0%	71	100.0%
Heat-treated										
no	6	85.7%	27	48.2%	2	100.0%	3	50.0%	38	53.5%
yes	-	-	3	5.4%	-	-	1	16.7%	3	4.2%
possibly	1	14.3%	1	1.8%	-	-	1	16.7%	3	4.2%
indeterminate	-	-	25	44.6%	-	-	1	16.7%	26	36.6%
totals	7	100.0%	56	100.0%	2	100.0%	6	100.0%	71	100.0%

Table 24. LA 68185: summary of complete core dimensions.

	Dimensions (mm) and Weight (g)			
n=5	Length	Width	Thickness	Weight
mean	51.20	42.60	28.80	82.68
range	39.0	59.0	19.0	175.2

Table 25. LA 68185: summary statistics of complete core-reduction flakes.

	Dimensions (mm) and Weight (g)			
n=11	Length	Width	Thickness	Weight
mean	22.18	17.18	6.36	3.44
range	38.0	22.0	8.0	54.6

Table 26. LA 68185: summary of selected observations on core-reduction flakes.

Attribute	Number	Percent
Platform types		
cortex	3	12%
single flake scar	4	16%
multiple flake scars	10	40%
pseudodihedral	1	4%
edge or ridge-like remnant	1	4%
destroyed during detachment	6	24%
total	25	100%
Distal termination type		
feathered	3	14%
modified feathered	14	64%
hinged or stepped	5	23%
total	22	100%
Dorsal cortex		
0%	4	36%
1-10%	1	9%
11-25%	2	18%
26-50%	2	18%
51-75%	1	9%
76-90%	1	9%
total	11	100%

CHAPTER 10

Petrographic Analysis of Three Plain Ware Sherds from LA 68182

DAVID V. HILL

Introduction

The three sherds examined petrographically represent plain ware types associated with the Jornada Mogollon Brown ware tradition of south-central and southeastern New Mexico.

The sherds were analyzed by the author (Hill) using a Nikon Optiphot-2 petrographic microscope. The sizes of natural inclusions and tempering agents were described in terms of the Wentworth Scale, a standard method for characterizing particle sizes in sedimentology. The sizes were derived from measuring a series of grains using a graduated reticle built into one of the microscope's optics. The percentages of inclusions in the ceramics were estimated using comparative charts (Matthew et al. 1991; Terry and Chilingar 1955).

Analysis of the Ceramic Sample

Sherd 756 (Typed as Jornada Brown by Wiseman)

The paste of this sherd is a medium brown color and is slightly birefringent. The inclusions in the ceramic body are bimodally distributed in terms of size. Very fine to fine inclusions make up 15% of the paste. These inclusions are dominated by orthoclase; only about 5% or less of the inclusions are classifiable as quartz, plagioclase, biotite and hornblende. A few black opaque inclusions are present that represent biotite that has altered to hematite and clay minerals.

Five percent of the clay body contains rock fragments and isolated mineral grains that range in size between medium and very coarse. The rock fragments are characterized by orthoclase or microcline and plagioclase. The texture of the rock fragments is anhedral granular. However, the overall particle size of the minerals contained within the rock fragments varies from medium to coarse.

The feldspars as slightly clouded through weathering to clay minerals and sericite. The degree of weathering is variable among the mineral grains and rock fragments. The rock fragments usually contain magnetite cubes. One fragment contains green hornblende surrounded by a hematite stain. The isolated mineral grains consist primarily of orthoclase followed by microcline and plagioclase. These mineral grains show the variable weathering displayed in the rock fragments

Sherd 473-J (Typed as Jornada Brown by Wiseman)

The paste of this sherd is dark brown. The inclusions, which include both isolated mineral grains and rock fragments, follow a continuous size distribution of very fine to coarse; the rock fragments fall into the medium to coarse size range. The mineral grains and rock fragments account for 35% of the ceramic body.

The rock fragments consist of fine- to medium-grained orthoclase and plagioclase. Identification of the feldspars is difficult due to the degree of alteration to clay minerals and sericite. Two of the rock fragments contain quartz porphyritically, otherwise the rock fragments are holocrystalline. Fine magnetite cubes are present in the rock fragments and are surrounded by hematite staining. Isolated minerals in the paste consist primarily of orthoclase, plagioclase with trace amounts of quartz, and altered brown biotite.

Based on the degree of weathering of the feldspars and biotite, and the continuous size distribution of the rock fragments and mineral grains, it is likely that the these materials were naturally present in the ceramic clay.

Sherd 473-SP (Typed as South Pecos Brown by Wiseman)

The paste of this sherd is medium brown and slightly birefringent. The paste contains about 35% inclusions consisting of holocrystalline rock fragments and mineral grains with similar compositions and degrees of weathering as sample 473-J. The difference in the paste between the two sherds is most likely the result of slightly different degrees of firing.

Discussion

Samples 756 and 473-J both contained highly weathered quartz monzonite that was likely a natural inclusion in the ceramic clay. A similar weathered granite aplite or quartz monzonite was identified in 473-SP. All three sherds are from the Jornada Mogollon Brown ware tradition.

Ceramics produced within the Jornada Mogollon Brown ware tradition in southeastern New Mexico have been identified as containing rock fragments and isolated mineral grains from the intrusive rocks found in the Lincoln County Porphyry Belt (Allen and Foord 1991). These intrusive rock types include granite, aplite granite, monzonite, and quartz monzonite. Other types of intrusive rock have been reported but are less common (Allen and MacLemore 1991). Occasional ceramics tempered using microcline granite produced in the vicinity of El Paso, Texas, have also been reported from southeastern New Mexico (Hill 1988).

CHAPTER 11

Fauna at LA 68182

NANCY J. AKINS AND **SUSAN M. MOGA**

Los Molinos—LA 68182—produced a good sample of fauna: 9,915 pieces of bone and 934 pieces of mussel shell. Most of the assemblage was recovered subsurface and from the crevice. Severe breakage and fragmentation rendered much of the bone unidentifiable beyond animal size.

Methods

The amount of breakage and number of potentially unidentifiable specimens necessitated a two-level analysis. About 77 percent, mostly unidentifiable except for animal size, were rough-sorted by size as indeterminate, small (jackrabbit or smaller), medium, or large (larger than coyote) mammal. Other than the size group, only the count and amount of burned bone for each body size were recorded.

The rest of the collection was fully analyzed using an OAS format that computer-coded the following variables: site number, site provenience information, field specimen number (FS), lot number, taxon, count (number of specimens or NISP), the body part or element, element side, percent of the element represented by that specimen, age of the animal, criteria for aging, the presence, location, and degree of environmental, animal and thermal alteration, type of processing, and whether there was any modification.

Bone was dry-brushed then identified using the OAS comparative collections supplemented by collections at the Museum of Southwestern Biology, Divisions of Herpetology and Mammals, at the University of New Mexico. Sources on the fauna of New Mexico (Bailey 1971; Degenhardt et al. 1996; Findley et al. 1975; Hubbard 1978) were consulted for information on the fauna from the Roswell area, and taxa that are unlikely for the area were checked and corrected. Data were analyzed using SPSS 7.0. Invertebrate remains are included in the counts or percentages but not in the discussions.

Taxa Recovered

The numerous species represented in the LA 68182 collection (Table 27) include some that are undoubtedly postoccupational intruders. Many specimens represent animals exploited by the prehistoric residents, and species commonly represented in archaeological assemblages are among the most abundant at this site. Rabbit and prairie-dog bones are the most numerous. Pronghorn and bison or possible bison (*Bison/Bos*) bones are less so, but both greatly outnumber counts for deer. Birds are sparse; turtles are diverse and relatively abundant.

Use of quarter-inch screen has undoubtedly influenced the recovery and counts. In a recent study of a Hohokam midden, James (1997:386) found that 95 percent of the small rodent bones, 86 percent of the squirrel and chipmunk bones, 71 percent of the rabbit bones, 47 percent of the medium- or coyote-sized mammals, and no artiodactyl bones were lost through the use of that screen size. This suggests that, for LA 68182, small and rabbit-sized mammals were even more prevalent than indicated by the counts.

This section contains much of the information at the taxon level. Suggestions of number of animals of each kind (MNIs) should not be treated as absolutes. Element fragmentation is recorded in a manner that often makes these estimates little more than educated guesses.

Rodents

Several rodent and squirrel species were recovered. Prairie dogs and muskrats are the most likely food animals. Many of the others are burrowers that could have accidentally found their way into the site assemblage. Nine elements were recognizable only as rodent. These are mostly tooth fragments (n=5) along with vertebrae (n=2), a radius shaft, and a femur shaft. None are burned or obviously processed.

Ground squirrels. Three species of small ground squirrel inhabit Chaves county: *Spermophilus tridecemlineatus* (the thirteen-lined ground squirrel), *Spermophilus mexicanus* (the Mexican ground squirrel), and *Spermophilus spilosoma* (the spotted ground squirrel). The first is found in short grass plains and occasionally in relic grassland in mesic mountain ranges (Findley et al. 1975:118), whereas the Mexican ground squirrel inhabits grasslands containing mesquite, cactus, or shrubs and has been observed in and adjacent to the Pecos Valley (Findley et al. 1975:120). Spotted ground squirrels are found in grassland and desert environs (Findley et al. 1975:121).

Only three ground squirrel specimens were identified. Parts include much of a mandible and small fragments of a humerus and femur, which could represent a single animal. None have definite signs of processing (burning or unambiguous breaks). Inactive during the colder part of the year, they could be good indicators of seasonality; however, they are also burrowers who could also be later residents of the site area or could have been taken and deposited by carnivores or raptors.

***Cynomys ludovicianus* (black-tailed prairie dog).** One of the more common animals represented in the assemblage (291 elements or 2.9 percent), this species of prairie dog inhabits shortgrass plains including semi-desert environs. They live in large colonies, and were much more numerous in the past. In the southern part of the state they become fat in the fall and remain active during winter rather than hibernating (Findley et al. 1975:130-132).

Clustered in colonies, prairie dogs were probably a relatively easy and reliable prey for prehistoric populations. Up to 27 individual prairie dogs are represented by the 291 elements. Two are young or immature, indicating that at least some of the deposition—if human—took place in the warm season, probably May or June (Bailey 1971:124). About two-thirds (about 66 percent) of the pieces recognized as prairie dog are cranial (Table 28) with no other element suggesting any more than 11 individuals, and several major parts absent or infrequent. This could indicate more processing of noncranial parts, rendering them unidentifiable, or it could be an artifact of a recording system that does not identify cranial parts with the precision necessary to accurately determine the numbers of individuals, or it could be due to the use of quarter-inch screen. The amount of burning (about 8 percent) and fragmentation (about 70 percent are less than half the element, and only 3.5 percent are complete) is consistent with human food debris. Burns

Table 27. LA 68182: faunal taxa recovered.

	n	%		n	%
Mammal	154	1.6%	Deer	30	0.3%
Unknown small	1	0.0%	Pronghorn	87	0.9%
Small mammal	1099	11.7%	Bison	45	0.5%
Medium mammal	2878	30.7%	*Bos* /bison	34	0.4%
Large mammal	3680	39.3%	Birds	15	0.2%
Rodent	9	0.1%	Ducks	2	<0.1%
Ground squirrels	3	<0.1%	Turkey	4	<0.1%
Black-tailed prairie dog	291	3.1%	American coot	2	<0.1%
Pocket gophers	9	0.1%	Pigeons and doves	1	<0.1%
Plains pocket gopher	2	<0.1%	Small perching birds	2	<0.1%
Yellow-faced pocket gopher	19	0.2%	Turtles and tortoises	149	1.6%
Banner-tailed kangaroo rat	8	0.1%	Snapping, musk, mud turtles	1	<0.1%
Northern grasshopper mouse	2	<0.1%	Snapping turtle	6	0.1%
Hispid cotton rat	3	<0.1%	Yellow mud turtle	135	1.4%
Woodrats	10	0.1%	Box or water turtles	2	<0.1%
Muskrat	35	0.4%	Painted turtle	1	<0.1%
Porcupine	1	<0.1%	Pond slider	2	<0.1%
Rabbits	1	<0.1%	Western river cooter	1	<0.1%
Desert cottontail	401	4.3%	Ornate box turtle	3	<0.1%
Black-tailed jackrabbit	163	1.7%	Spiny softshell turtle	16	0.2%
Dog, coyote, wolf	28	0.3%	Horned lizards	3	<0.1%
Raccoon	1	<0.1%	Nonvenomous snakes	7	0.1%
Weasels and allies	1	<0.1%	Frogs and toads	3	<0.1%
Striped skunk	6	0.1%	Plains spadefoot toad	1	<0.1%
Artiodactyl	558	6.0%	**Total**	**9363**	**100.0%**

are restricted to light (n=13) and heavy (n=10), and the parts to cranial (n=9), innominate (n=1), arm (n=6), and tibiae (n=7).

Pocket gophers. Both *Geomys bursarius* (plains pocket gopher) and *Cratogeomys castanops* (yellow-faced pocket gopher) inhabit the Roswell area. The plains pocket gopher is most common in soft alluvial soils in arroyo bottoms and on floodplains. Harder, shallower soils are more often occupied by the yellow-faced pocket gopher (Findley et al. 1975:152-154). Counts for these species (n=2 plains, n=19 yellow-faced, n=9 indeterminate) are consistent with descriptions of habitat at or near the site. As burrow-dwelling rodents, pocket gophers collect succulent food around the entrances to their burrows, and feed on roots and, when necessary, on aboveground woody vegetation under snow. Their burrows serve as shelter for a wide variety of other animals, including toads, box turtles, lizards, cottontail rabbits, ground squirrels, voles, weasels, grasshopper mice, striped skunks, and burrowing owls (Chase et al. 1982: 246-247). The pocket gophers found in this assemblage could very well represent postoccupational burrowers plus a few taken by humans when other resources were scarce.

Body parts suggest that as few as one immature of an undetermined species, one plains, and four yellow-faced pocket gophers are represented in the collection. Specimens from the yellow-faced pocket gopher are largely cranial pieces (84.2 percent) plus sparse other parts. The unidentified and plains are mainly innominate and long-bone fragments. Many parts of these fairly small rodents would not be retrieved by quarter-inch screen, which could account for their absence. None of the specimens exhibits unambiguous human-caused breakage, but three of the indeterminate pocket gopher specimens are burned (two light brown, possibly scorched, and one burned black). Overall, about half the elements tend to be complete or largely so, and half fairly fragmentary. Thus, the presence of burning and a good amount of fragmentation indicate that some of these small rodents were eaten, and that others more likely represent yellow-faced gophers that inhabited the site area. Indeed, none of the yellow-faced specimens were burned, and over 42 percent are largely complete (>75 percent of the element is represented).

***Dipodomys spectabilis* (banner-tailed kangaroo rat).** Eight pieces of a larger kangaroo rat, presumably the banner-tailed, were found in the assemblage. This species prefers heavier soils in which they dig deep and complex burrow systems near grassy areas. Found in the Pecos Valley, the closest reported sightings are 20 miles north of Roswell (Findley et al. 1975:180-182). *Dipodomys ordii* (Ord's kangaroo rat) is much more common in the area (Findley et al. 1975:174-175), and the pieces recovered could represent a large individual.

Body parts are almost evenly divided between cranial fragments, innominates, and rear legs, and could represent a single individual. Half of the specimens are at least 75 percent complete and none are burned or exhibit unambiguous breakage suggestive of processing by humans. It is quite likely that all or most of the kangaroo rats found here were postoccupational burrowers, or were left by agents other than humans.

***Onychomys leucogaster* (northern grasshopper mouse).** Like Ord's kangaroo rat, the grasshopper mouse prefers sandy soils and mesquite stands (Findley et al. 1975:227). The two elements here, most of a mandible and a tibia, suggest a postoccupational burrower rather than a human food item.

***Sigmodon hispidus* (hispid cotton rat).** Cotton rats are grassland species limited to areas with a growing season of at least 180 days and a mean annual temperature of more than 55 degrees F (Findley et al. 1975:233). The three specimens here are parts of a mandible, femur, and tibia, none of which exhibit evidence of processing by humans.

***Neotoma* spp. (woodrats).** Two species of woodrats inhabit the Roswell area and Chaves County. *Neotoma micropus canescens*, the southern plains woodrat, is a grassland species that can occur with *Neotoma albigula* (the white-throated woodrat), which prefers rocky foothill habitats but is common in the grasslands of the southern part of the state (Findley et al. 1975:238-242). Half of the specimens recovered are cranial, followed in number by axial parts (vertebrae, scapula, and innominate), and tibiae (n=2). Both immature and mature individuals are represented. None are burned or exhibit unambiguous evidence of human processing, and over half (60 percent) are complete or nearly so (>75 percent complete). Again, the lack of processing and presence of relatively complete specimens suggests these rodents entered the assemblage by means other than human capture and deposition.

***Ondatra zibethicus* (muskrat).** Muskrats live in marshes along the Pecos River (Findley et al. 1975:264), denning in high firm banks (Perry 1982:287), and may well have inhabited the Middle Berrendo River just below LA 68182. Relatively abundant, 35 specimens represent at least two individuals, one immature to juvenile and one mature. Cranial parts are the most common (62.8 percent), followed by vertebrae (20.0 percent), and rear limbs and feet (17.2 percent). Parts tend to be complete (11.4 percent) or nearly complete (60.0 percent) with some burning (8.6 percent lightly burned or scorched) and no other unambiguous evidence of processing. This somewhat conflicting evidence seems to suggest that muskrats were occasionally hunted and consumed but did not play an important role in subsistence. Their nocturnal habits and territoriality may have made taking them other than by traps somewhat difficult. Properly cooked muskrats provide a sweet, rich, and tender meat (Perry 1982:300-306).

Erethizon dorsatum **(porcupine).** Found almost everywhere, porcupines occur sporadically in grasslands where they den along arroyos or in rocky areas (Findley et al. 1975:273). The element here is a complete second phalanx that could represent either an accidental or human deposition.

Rabbits

Sylvilagus audubonii **(desert cottontail).** This species of cottontail is the only one reported for the Roswell area (Findley et al. 1975:83-90). It is by far the most numerous of the small mammals recovered from LA 68182 (n=401 or 4.0 percent), and at least two immature and 15 mature cottontail rabbits are represented by a diversity of body parts (Table 28). More specimens represent less than half of the element (67 percent) and few are complete (8.7 percent). Heat-alteration is relatively common and includes light burns or scorching (9.2 percent), heavy or black burning (4.2 percent), and single incidences of calcined and graded heavily burnt to calcined (0.2 percent each). No cuts or unambiguous indications of butchering were noted.

Table 28. LA 68182: body part distribution for prairie dogs, cottontails, and jackrabbits

Element	Prairie Dogs	Cottontails	Jackrabbits
Cranium	93	55	47
Mandible	63	67	22
Tooth	35	16	7
Vertebra	1	-	-
Cervical vertebra	-	1	2
Thoracic vertebra	-	1	1
Lumbar vertebra	1	13	3
Sacrum	1	-	-
Clavicle	2	-	-
Scapula	11	30	7
Innominate	11	41	8
Humerus	15	29	17
Radius	9	8	5
Ulna	13	15	6
Carpal	-	-	1
Metacarpal	1	1	-
Femur	12	20	8
Tibia	20	45	6
Astragalus	-	1	3
Calcaneous	3	26	4
Metatarsal	-	30	10
Phalanx	-	2	6
Total	291	401	163

The overall abundance of cottontail remains and burning indicate that most of the cottontail remains were left by humans, and that cottontails played a significant role in the subsistence practices of the site inhabitants. Because the site appears to be a repeatedly occupied campsite rather than a habitation, use of cottontails must represent a strategy other than garden hunting. In theory, gardening disturbs existing habitats while creating havens for certain species of small mammals. As a result, considerable hunting activity was directed toward protecting the crops from these pests and at the same time proving animal resources (Linares 1976:332; Speth and Scott 1989:74).

Lepus californicus **(black-tailed jackrabbit).** Found throughout the state, this jackrabbit can utilize green or succulent vegetation for water (Findley et al. 1975:93-94). Much less common (n=163 or 1.6 percent) than cottontails, jackrabbits are the third most common of the small animals most likely to be pursued for food. One immature and at least nine mature jackrabbits are represented. Body parts are distributed much like cottontails and prairie dogs, with most elements represented (Table 28). Similarly, most specimens consist of less than half of the element (73.6 percent), and few are complete (6.7 percent). Proportions of burned bone (8.9 percent) fall between those for cottontail and prairie dog. Most (8.6 percent) are lightly burned or scorched, and only a few (1.2 percent) are burned black. No unambiguous evidence of butchering was noted.

Carnivores

Canis **spp. (dog, coyote, or wolf).** Once common in grasslands, coyotes have been largely exterminated, as have wolves (Findley et al. 1975:281-285). The few specimens here (n=28 or 0.3 percent) could represent any or all three species. Two age groups were noted, immature and mature, indicating at least two animals. Cranial parts, especially isolated teeth (17.9 percent cranium, 10.7 percent mandible, and 25.0 percent teeth), are common; occurrences of vertebrae, front and rear legs, and foot bones are rare (n=1 to 3). None display evidence of heat-alteration or unambiguous butchering. A slight majority (60.7 percent) of the specimens consists of less than half of the element. Lacking unequivocal evidence of processing by humans, it is difficult to say whether these species played a part in human subsistence.

Procyon lotor **(raccoon).** Raccoons are common near permanent watercourses and are occasionally found in desert and grasslands away from water (Findley et al. 1975:298). The single element from a raccoon is a nearly complete sacral vertebra that lacks evidence of processing. It is difficult to say how this species became deposited at the site.

***Mephitis mephitis* (striped skunk).** Most common in grasslands and woodlands, striped skunks are also found along arroyos and in agricultural areas (Findley et al. 1975:310-311). The specimens here (and possibly the phalanx attributed to weasels and allies) represent a scattering of body parts including vertebrae and both front and hind limbs. The phalanx is complete, but most (66.7 percent) of the skunk specimens consist of 25 to 50 percent of the element. None are burned or obviously processed, suggesting this was an unlikely human food item.

Artiodactyls

Artiodactyl species. Pieces recognized as artiodactyl but not assigned to a genus or species comprise one of the more numerous taxa at 558 specimens (5.6 percent). A small number (n=2) are from young animals. Most are small fragments (95.0 percent consist of less than 25 percent of the element), and tooth fragments dominate the group (520 or 93.2 percent). Small numbers of cranial, vertebral, rib, long-bone, and foot fragments are also reported (Table 29). A general lack of burning (0.9 percent; 3 scorched, 1 blackened, 1 graded heavily burned/calcined) and processing is not surprising given the dominance of tooth fragments for this taxon.

Table 29. LA 68182: artiodactyl body part distribution.

Element	Artiodactyls	Deer	Pronghorn	*Bison*	*Bos/Bison*
Antler	1	-	-	-	-
Cranium	4	1	-	1	1
Mandible	1	1	2	-	2
Tooth	520	1	9	16	10
Cervical vertebra	-	1	1	5	1
Thoracic vertebra	2	1	1	-	-
Lumbar vertebra	2	2	1	2	2
Rib	1	1	-	-	2
Ossified cartilage	1	-	-	-	-
Scapula	-	-	6	1	1
Innominate	-	2	2	2	-
Humerus	-	1	1	-	-
Radius	-	3	8	2	-
Ulna	-	-	3	-	-
Carpal	1	1	2	1	5
Metacarpal	-	1	5	1	-
Femur	1	1	2	-	-
Patella	-	1	-	-	-
Tibia	-	1	6	1	-
Tarsal	2	-	5	2	1
Astragalus	-	2	1	-	-
Calcaneous	-	1	3	1	-
Metatarsal	-	3	2	1	-
Carpal or tarsal	4	-	5	-	1
Metapodial	14	1	1	1	3
Phalanx	4	4	21	8	5
Total	558	30	87	45	34

***Odocoileus* spp. (deer).** Mule deer (*Odocoileus hemionus*) are widespread in this area, although white-tailed deer (*Odocoileus virginianus*) can currently be found in the sandhills east of Roswell (Findley et al. 1975:328-332), thus the presence of either or both is possible. At least four animals are represented (including a fetal or newborn, an immature, and two full-sized animals); deer are the least well represented of the artiodactyl species (n=30 or 0.3 percent). The young animals are good evidence for mid- to late-summer occupation because in southern areas fawns are born in July and August (Mackie et al. 1982:867).

In contrast to the small mammals, cranial parts are sparse (9.9 percent); foot elements (43.2 percent), especially phalanges (13.3 percent), are the commonest. Vertebrae are sparse (n=4), as are rib (n=1) and innominate (n=2) fragments. Only one piece of deer bone was burned (black), and, other than one midshaft impact fracture, the breaks are limited to splits. Most of the deer bone is broken into small pieces: 30 percent consist of 25 to 50 percent of the element; 53.3 percent consist of less than 25 percent.

***Antilocapra americana* (pronghorn).** Pronghorn live in open grasslands and are still found in the Roswell area (Findley et al. 1975:333-334). Although they are far more numerous by count than deer (n=87 versus n=30), fewer individuals may be represented in the LA 68182 assemblage. One immature and two mature animals are the minimum number of pronghorn indicated by body parts. As with deer, few cranial parts occur (12.6 percent), whereas foot bones (51.4 percent), especially phalanges (24.1 percent), are common. Axial parts such as vertebrae and innominates occur in small numbers (Table 29). Only one piece exhibits heat alteration—light brown or scorched. Two chops and 11 impact breaks were recorded, along with fair numbers of ambiguous breaks. Fragmentary representation (<50 percent) is the most common (60.9 percent).

***Bison bison* and *Bison/Bos* (bison, and bison or cow).** Bison were common on the eastern plains of New Mexico into early historic times (Findley et al. 1975:335). Remains are found in most prehistoric assemblages from the area, showing a definite presence over time. Numbers may have fluctuated, and there is evidence that bison populations increased in the late prehistoric period (Speth 1997:3).

Bison (n=45 or 0.5 percent) and probable bison (n=34 or 0.3 percent) elements indicate the presence of at least two individuals, one immature and one mature. Elements are small and the few measurable parts thought to be bison are slightly smaller or barely within the range of measurements for bison from the Garnsey site (Speth 1983:Tables 22 and 28) (distal tibia H=61.40, I=43.77, K=36.01, L=40.42; distal radius G=71.47, H=44.89, I=35.25, K=24.70).

Cranial parts are abundant for both bison and bison/cow (37.8 and 38.2 percent); tooth fragments are especially common (35.6 and 29.4 percent). Vertebrae, ribs, front and hind limbs, and foot elements are represented (Table 29). Neither taxon exhibits burning. Chops were found on one specimen, impact breaks on two, and unequivocal breaks on 20 others. Complete bones were relatively rare (13.3 and 8.8 percent); most specimens consisted of less than half of the element (55.5 and 61.8) percent. Such a variety of parts suggests that the animals were taken nearby. If killed at any distance, skulls were often left behind, as were the pelvis, vertebral column, and ribs (Dallman 1983:33).

Birds

Aves (bird). The unidentified bird consists of 15 small pieces that are identifiable only as bird vertebra, ribs, and other nondiagnostic parts. None are burned or exhibit unambiguous evidence of human processing. Most are fragmentary (92.3 percent consist of less than half of the element) and could be from the array of identified bird taxa.

Anatidae (waterfowl). Two specimens, a carpometacarpus and a wing digit, closely resemble ducks in morphology but the species could not be determined. A number of similarly sized water birds inhabit the nearby Bitterwater Wildlife Refuge or the Pecos River valley, including *Anas discors* (blue-winged teal), *Anas cyanoptera* (cinnamon teal), *Oxyura jamaicensis* (ruddy duck), *Lophodytes cucullatus* (hooded merganser), and *Mergus serrator* (red-breasted merganser) (Hubbard 1978:6-12). The digit is complete but could not be matched with a species. The carpometacarpus is fragmentary and unburned.

Meleagris gallopavo **(wild turkey).** The present distribution of the wild turkey includes the Mogollon and Sacramento highlands, where they inhabit evergreen and pine-oak woodlands of montane regions and canyon areas, and adjacent riparian woodlands (Hubbard 1978:20). Domestic turkeys can be found wherever humans brought them. The paucity of turkey specimens is more consistent with the occasional hunting of wild birds. Turkeys are also rare in assemblages from the nearby sites of Rocky Arroyo and Henderson Site (Emslie et al. 1992:98), but three turkey burials were found at the Fox Place (Akins 2002). Parts found at LA 68182 include less than half of two cervical vertebrae and an innominate, and a complete coracoid. None are burned or have unambiguous evidence of human processing.

Fulica americana **(American coot).** Coots are locally abundant near water at lower and middle elevations (Hubbard 1978:22), and are common in assemblages from Rocky Arroyo and the Henderson Site. It is the most numerous bird species both in NISP and MNI for both sites (Emslie et al. 1992:93-94), and was relatively common at the nearby Fox Place (Akins 2002), which suggests that it is a relatively desirable or easily obtained prey. Neither of the two specimens from LA 68182 displays definite evidence of processing by humans.

Columbidae (dove). A complete humerus, almost identical to that of a mourning dove (*Zenaida macroura*), was recovered. Mourning doves occur statewide, as does the closely related white-winged dove (*Zenaida asiatica*) (Hubbard 1978:31). This particular specimen was damaged by a carnivore, which suggests that it could have been deposited by means unrelated to a human presence.

Passerifomes (small perching birds). A partial humerus and maxilla from small perching birds were not identified further. Neither is burned or broken in a manner suggesting processing by humans.

Turtles

Testudinata (turtles). Fragments of turtle bone that could not be identified to the family level were placed in this taxon (n=149). Most are pieces of carapace (78.5 percent) or plastron (2.7 percent) but also present are unidentified long-bone fragments (12.1 percent), plate or blade pieces (2.0 percent), vertebrae (2.0 percent), innominates (1.3 percent), and a metatarsal (0.7 percent). A single piece is burned black, and none of the pieces exhibit unambiguous evidence of human processing. Almost all represent less than a quarter of the element (96.6 percent); 2.0 percent consist 25 to 50 percent of the element; the rest are indeterminate.

Chelydridae (snapping, musk, and mud turtles). One piece, a vertebra, was identified only to the family level. It was fragmentary (25 to 50 percent of the element) and bore no evidence of human processing.

Chelydra serpentina **(snapping turtle).** Six pieces of snapping turtle bone were recovered. These are the largest and most ferocious of turtles, with powerful jaws that can tear flesh. They spend most of their time underwater, and emit a potent musk when handled. Their preferred habitat is quiet permanent water with aquatic vegetation, but they have been found in river channels and tributaries lacking vegetation, including along the Pecos River. Most of their time is spent on the bottom, often buried in mud (Degenhardt et al. 1996:95-98). If taken near the site, the presence of this species suggests that the Middle Berrendo River was a permanent water source during at least part of the site's occupation.

An immature and a mature individual are represented by vertebrae (n=2), innominates (n=3), and carapace (n=1) fragments. Only one of these specimens consists of more than half of the element. None are burned or have evidence of processing by humans. Given their ferocity and the difficulty in obtaining this species, it is unlikely that it was actively pursued as a food resource. This one may have been scavenged or caught inadvertently.

Kinosternon flavescens **(yellow mud turtle).** These small turtles release a strong musky odor when captured. They inhabit arid to semiarid grasslands and open woodlands where soil is suitable for digging. Although more of their annual cycle is spend underground, mating, drinking, and most feeding occurs in water. The are poor swimmers that prefer quiet water with muddy or sandy bottoms, such as streams, rivers, ponds, or temporary waters. Yellow mud turtles are found throughout Chaves County, clustering along the Pecos River (Degenhardt et al. 1996:113-114).

Of the 135 pieces recovered, at least 77 are from a single immature turtle found 20 cm below the surface. Parts include most long bones, neck vertebrae, carapace, and even the keratinous layer that covers the shell. The other specimens come from 19 other squares and levels ranging from 10 to 90 cm below ground surface. Parts are all carapace or plastron pieces, two of which are burned black. In spite of their size and musky odor, the burning and wide distribution within the site suggests occasional use of this taxon by humans.

Emydinae (box and water turtles). Two marginal carapace fragments could come from either a box or water turtle, probably one of those listed below. Both are small fragments and neither has evidence of processing by humans.

Chrysemys picta **(painted turtle).** Painted turtles generally inhabit slow-moving portions of rivers, lakes, marshes, and ponds, but are occasionally found in semipermanent water accessible by short overland excursions. Much of their time is spent in the sun-warmed surface water, on riverbanks, or on logs or other debris away from the shore. In most areas they hibernate between October or November and February or March in the bottoms of permanent waters. They are found along the Pecos River in the Roswell area (Degenhardt et al. 1996:100-102). A single pleural carapace fragment represents this species. It is unburned and has no evidence of human processing.

Trachemys scripta **(red-eared slider).** Found in drainages of the Pecos River near Roswell, the slider is a medium to large turtle that primarily inhabits permanent wetlands, preferably with aquatic vegetation, soft bottoms, and still or slow-moving water 1 to 2 m deep. It feeds and basks during the day, quickly disappearing below the water surface when approached. Preferred basking spots are on logs or rocks away from the shore but banks are occasionally used. Hibernation is probably in the bottom of permanent bodies of water. Overland movement is common (Degenhardt et al. 1996:109-110).

Parts include a piece of the plastron and an innominate, the latter from an immature individual. Both pieces represent less than half of the element. Neither is burned or exhibits evidence of processing by humans.

Pseudemys gorzugi **(western river cooter).** The western river cooter is found in the lower Pecos River drainages; there has been an unconfirmed sighting near Roswell. It is generally found south of Brantley Reservoir. It is a large turtle that lives mainly in riverine habitats where it is confined to large, deep pools along the Pecos, Black, and Delaware rivers. Aquatic vegetation is desirable, as are muddy, sandy, or rocky areas. It is frequently seen basking at the surface of water, on logs, overhanging vegetation, or muddy banks. It is quick to retreat when approached and most active in daytime. They remain active into the winter (Degenhardt et al. 1996:102-104).

The element here, part of a plastron, is too thick and flat to be from a slider and agrees well with a comparative cooter. It is not burned and exhibits no other characteristics that could be interpreted as human processing.

Terrapene ornata **(ornate box turtle).** This is the only species of box turtle found in New Mexico, where it is common in the southeastern part of the state. This relatively small terrestrial species does not depend on free water and occupies a wide range of habitats. They are most abundant in grasslands where soils allow burrowing. They forage in the morning and late afternoon, and retreat to their burrows at midday and at night. Hibernation lasts from October or November to March or April (Degenhardt et al. 1996:104-107).

The three pieces here are a pleural and marginal from a carapace and a femur. None are burned or exhibit evidence of processing.

Trionyx spiniferus **(spiny softshell turtle).** This species of softshell turtle occurs in the Pecos River where it primarily inhabits the river but is occasionally found in temporary ponds near rivers. It seems to prefer shallow water with beaches or where streams enter. In New Mexico, softshells are rarely found far from permanent water. They are highly aquatic and spend little time on land but bask on banks or sandbars. Hibernation periods resemble those of the other turtles found in the area (Degenhardt et al. 1996:121-124).

Softshells parts are numerous in the assemblage (n=16), yet there is no duplication of parts and a single turtle could account for all those found. Most are carapace (31.3 percent) or plastron (43.8 percent) fragments with a scattering of other elements. Two pieces have graded light to heavy burning suggestive of roasting. One piece had cut marks and others had sharp breaks that could result from processing. Virtually all are small pieces representing less than a quarter of the element (87.5 percent). It is quite likely that softshells were occasionally used for food.

Reptiles

***Phrynosoma* spp. (horned lizards).** The two species of horned lizard found in Chaves county are *Phrynosoma cornutum* (the Texas horned lizard), which inhabits open deserts and grasslands, and *Phrynosoma modestum* (roundtail horned lizard), which occupies a variety of desert grassland and shrubland habitats (Deganhardt et al. 1996:148-157). Three cranial fragments from at least two individuals could represent either or both species. Horned toads are an unlikely human food item.

Colubridae (nonvenomous snakes). Seven vertebrae are from nonvenomous snakes. All are from medium to large snakes. The most likely species include *Coluber constrictor* (eastern yellowbelly racer), *Elaphe guttata* (corn snake), *Gyalopion canum* (western hooknose snake), *Heterodon nasicus* (western hognose snake), *Lampropeltis triangulum* (milk snake), *Masticophis flagellum* (coachwhip), *Pituophis melanoleucus* (gopher snake), *Rhinocheilus lecontei* (Texas longnose snake), *Tantilla nigriceps* (plains blackhead snake), *Thamnophis marcianus* (checkered garter snake), or *Thamnophis proximus* (western ribbon snake) (Degenhardt et al. 1996:260-337). None of the vertebrae are burned or have evidence of processing and all but one are complete. Given that many species of snake inhabit rodent burrows, it is likely that the snake here is not the result of human deposition, or if so was not a food item.

Amphibians

Four toad or frog elements were recovered. These probably represent at least one spadefoot toad (*Scaphiopus* sp.) and possibly a fairly large *Bufo* (toads) and/or *Rana* (frogs) species. All three of the spadefoot toads found in New Mexico inhabit the Roswell area (*Scaphiopus couchii*, *Spea bombifrons*, and *Spea multiplicata*). Of the *Bufo*'s, *B. cognatus, B. debilis, B. speciosus*, and *B. woodhousii* are all found in the area. Two frogs, *Rana catesbeiana* (bullfrog) and *Rana blairi* (plains leopard frog) are possible given current species distributions (Degenhardt et al. 1996:35- 91).

The elements for this taxon include a femur shaft that is probably from a spadefoot toad; a tibia that is long and slim compared to a *Bufo*, which could be a *Rana*; a metatarsal that could be a large *Bufo*; and a fragmentary tibia that could be any of these. None are burned or show evidence of use by humans. Because most or all are burrowers, they could be postoccupational intrusives.

Freshwater Mussels

Freshwater mussels were not analyzed as part of the faunal assemblage and are the subject of a separate section of this volume. Numerous pieces of mussel shell (n=934) from the two species found in the area were found. *Cyrtonaias tampicoensis* (Tampico pearlymussel) lives in the lower portions of the Pecos River, inhabiting quiet or fast-running water of lakes, rivers, and small streams in soft mud, mud-sand, mud-gravel, and large pebble substrates (Metcalf 1982:50; Murry 1985:A-25). *Popenaias popeii* (Texas hornshell) is commonly found in the Pecos River and some tributaries. Little is known about its distribution, but it has been collected in mud-sand habitats (Metcalf 1982:45, Murry 1985:A-25). Mussels are far more common in this assemblage than in others reported for the area. Here, the ratio of mussel to bone is 1:10.6. At the Fox Place, located on the Hondo River, it is considerably lower at 1:44.5. Given this abundance, it is possible that one thing that attracted prehistoric groups to this location was the availability of freshwater mussels.

Indeterminate Taxa

The unidentifiable bone was categorized as mammal, unknown small animal, small mammal, medium mammal, or large mammal. Mammal bones are clearly mammalian but the body size uncertain. The unknown small bones could be from a small mammal, a fish, a reptile, or an amphibian. Small mammals are generally those up to and including jackrabbit in size. Medium mammals are from jackrabbit to coyote in size, and large mammals are from animals larger than a coyote. In terms of abundance, large mammals are the most frequent (37.1 percent), followed by medium mammals (29.0 percent), and small mammals (11.1 percent). All but 177 of the 7,812 of the specimens identifiable only to body size were rough-sorted and lack information on weathering, environmental or animal alteration, fragmentation, or body part.

Taphonomy

The natural processes that can alter a faunal assemblage are environmental conditions (weathering and diagenesis) and animal alteration. Recording them generally serves to identify and gauge the biases that result from non-human-related processes (Lyman 1994:1). Because these variables were not recorded for most of the assemblage (the rough-sorted portion) their frequencies are generally low. The few instances of animal alteration do little more than confirm that carnivores occupied the site area and rodents took advantage of the relatively soft soil in the crevice. Carnivore gnawing or tooth punctures were recorded for medium mammal (n=1), prairie dog (n=1), jackrabbit (n=1), artiodactyl (n=1), deer (n=3), pronghorn (n=2), bison (n=1), and coot (n=1); and rodent gnawing for cottontail (n=2) and pronghorn (n=1).

Both weathering and diagenesis—chemical and physical changes that occur after burial (Lyman 1994:506)—were difficult to evaluate because much of the sample was encrusted with black soil that could not be completely brushed away. The bulk of the assemblage (98.4 percent) has no alteration recorded. When found, it is generally weathered or checked (n=115 or 1.2 percent) with a few noted as pitted (46 or 0.5 percent). Little was recorded for any particular depth below surface (Table 30); alteration neither increased nor decreased substantially with depth.

Table 30. LA 68182: environmental alteration by level.

Base of Level	None/Not Applicable	Erosion or Pitting	Weathering or Checking	Total Percent
Not recorded	204 100.0%	- -	- -	204 2.1%
0 cm	34 89.5%	- -	4 10.5%	38 0.4%
10 cm	591 99.3%	1 0.2%	3 0.5%	595 6.0%
20 cm	2024 99.1%	4 0.2%	14 0.7%	2042 20.6%
30 cm	2468 98.1%	8 0.3%	40 1.6%	2516 25.4%
40 cm	1772 97.3%	24 1.3%	26 1.4%	1822 18.4%
50 cm	971 98.4%	5 0.5%	11 1.1%	987 10.0%
60 cm	754 98.2%	1 0.1%	13 1.7%	768 7.7%
70 cm	407 99.3%	1 0.2%	2 0.5%	410 4.1%
80 cm	321 99.7%	- -	1 0.3%	322 3.2%
90 cm	208 98.6%	2 0.9%	1 0.5%	211 2.1%
Total Percent	9754 98.4%	46 0.5%	115 1.2%	9915 100.0%

Seasonality

The presence of neonates and very young animals can provide information on whether a site was occupied during certain portions of the year, assuming the young animals were deposited by humans. Unfortunately, the remains found in archaeological sites are often a composite of human and predator debris as well as that left by rodents and other burrowing animals. Elevated areas favored by humans also attract other predators; plant resources utilized by humans also feed the local fauna; and the soft disturbed soils left by humans can provide ideal burrowing habitat. Thus, caution must be used when inferring seasonality from the presence of many of the hibernating species and young animals in an assemblage.

In this analysis, the term juvenile was used for animals falling between the neonate and young mature stages; immature could refer to neonate or juvenile; and young mature is used for animals that are essentially full grown with unfused or recently fused epiphyses or no dental wear. Criteria used for aging was most often size, but fusion, compaction or porosity of the bone, and dental wear were also employed.

Several species are represented by young and very young animals (Table 31). Among these are some that were human food items. Prairie dog young emerge in May or June (Bailey 1971:124). Young cottontail rabbits are found from at least May through October (Bailey 1971:58), perhaps accounting for the larger percentage of young for this taxon. Jackrabbit young appear from April through September (Bailey 1971:50). Neonate deer occur from July through August (Mackie et al. 1982:867). Muskrat young are found from May through August (Perry 1982:286). Bison calving peaks in May with a general range of mid-April to June (Reynolds et al. 1982:982).

Other species that are less likely human dietary components show similar patterns. Both wolf and coyote young are mostly found from April through September (Bailey 1971:305, 314). Many of the turtle species hibernate, generally between November and March, so that any presence and use by humans again indicates use of the site area during the warmer seasons.

The array of taxa and young of some species suggests that LA 68182 was inhabited in at least late spring or early summer (prairie dogs and jackrabbits) as well as mid to late summer (deer), assuming that young from these taxa were deposited by humans. This does not rule

Table 31. LA 68182: taxon by age.

	Indeter-minate	Fetal/ Neonate	Juvenile	Immature	Mature/ Young	Mature	Total Percent
Mammal	25	-	-	-	-	2	27
	92.6%	-	-	-	-	7.4%	1.2%
Unknown small	1	-	-	-	-	-	1
	100.0%	-	-	-	-	-	<0.1%
Small mammal	60	-	-	2	-	12	74
	81.1%	-	-	2.7%	-	16.2%	3.3%
Medium mammal	24	-	1	2	-	5	32
	75.0%	-	3.1%	6.3%	-	15.6%	1.4%
Large mammal	27	-	-	-	-	4	31
	87.1%	-	-	-	-	12.9%	1.4%
Rodent	6	-	1	-	-	2	9
	66.7%	-	11.1%	-	-	22.2%	0.4%
Ground squirrels	-	-	-	-	-	3	3
	-	-	-	-	-	100.0%	0.1%
Black-tailed prairie dog	30	-	1	6	1	250	288
	10.4%	-	0.3%	2.1%	0.3%	86.8%	12.8%
Pocket gophers	-	-	-	1	-	8	9
	-	-	-	11.1%	-	88.9%	0.4%
Plains pocket gopher	-	-	-	-	-	2	2
	-	-	-	-	-	100.0%	0.1%
Yellow-faced pocket gopher	-	-	-	-	-	19	19
	-	-	-	-	-	100.0%	0.8%
Banner-tailed kangaroo rat	-	-	-	2	-	6	8
	-	-	-	25.0%	-	75.0%	0.4%
Northern grasshopper mouse	-	-	-	-	-	2	2
	-	-	-	-	-	100.0%	0.1%
Hispid cotton rat	1	-	-	-	-	2	3
	33.3%	-	-	-	-	66.7%	0.1%
Woodrats	-	-	-	1	-	9	10
	-	-	-	10.0%	-	90.0%	0.4%
Muskrat	3	-	-	1	1	30	35
	8.6%	-	-	2.9%	2.9%	85.7%	1.6%
Porcupine	-	-	-	-	-	1	1
	-	-	-	-	-	100.0%	<0.1%
Desert cottontail	32	-	2	8	1	358	401
	8.0%	-	0.5%	2.0%	0.2%	89.3%	17.8%
Black-tailed jackrabbit	22	-	1	3	2	135	163
	13.5%	-	0.6%	1.8%	1.2%	82.8%	7.2%
Dog, coyote, wolf	6	-	1	-	1	20	28
	21.4%	-	3.6%	-	3.6%	71.4%	1.2%
Raccoon	-	-	-	-	-	1	1
	-	-	-	-	-	100.0%	<0.1%
Weasels and allies	1	-	-	-	-	-	1
	100.0%	-	-	-	-	-	<0.1%
Striped skunk	1	-	-	-	-	5	6
	16.7%	-	-	-	-	83.3%	0.3%
Artiodactyl	530	-	1	1	-	20	552
	96.0%	-	0.2%	0.2%	-	3.6%	24.5%
Deer	2	1	-	3	-	24	30
	6.7%	3.3%	-	10.0%	-	80.0%	1.3%
Pronghorn	2	-	-	2	1	82	87
	2.3%	-	-	2.3%	1.1%	94.3%	3.9%
Bison	2	-	2	5	-	36	45
	4.4%	-	4.4%	11.1%	-	80.0%	2.0%
Bos /bison	16	-	1	2	1	14	34
	47.1%	-	2.9%	5.9%	2.9%	41.2%	1.5%
Birds	11	-	-	-	-	2	13
	84.6%	-	-	-	-	15.4%	0.6%
Ducks	-	-	-	-	-	2	2
	-	-	-	-	-	100.0%	0.1%
Turkey	2	-	-	-	-	2	4
	50.0%	-	-	-	-	50.0%	0.2%
American coot	-	-	-	-	-	2	2
	-	-	-	-	-	100.0%	0.1%
Pigeons and doves	-	-	-	-	-	1	1
	-	-	-	-	-	100.0%	<0.1%
Small perching birds	1	-	-	-	-	1	2
	50.0%	-	-	-	-	50.0%	0.1%
Turtles and tortoises	149	-	-	-	-	-	149
	100.0%	-	-	-	-	-	6.6%
Snapping, musk, mud turtles	1	-	-	-	-	-	1
	100.0%	-	-	-	-	-	<0.1%
Snapping turtle	4	-	-	1	-	1	6
	66.7%	-	-	16.7%	-	16.7%	0.3%
Yellow mud turtle	49	-	-	86	-	-	135
	36.3%	-	-	63.7%	-	-	6.0%
Box or water turtles	2	-	-	-	-	-	2
	100.0%	-	-	-	-	-	0.1%
Painted turtle	1	-	-	-	-	-	1
	100.0%	-	-	-	-	-	<0.1%
Pond slider	1	-	-	1	-	-	2
	50.0%	-	-	50.0%	-	-	0.1%
Western river cooter	1	-	-	-	-	-	1
	100.0%	-	-	-	-	-	<0.1%
Ornate box turtle	2	-	-	-	-	1	3
	66.7%	-	-	-	-	33.3%	0.1%
Spiny softshell	15	-	-	-	-	1	16
	93.8%	-	-	-	-	6.3%	0.7%
Horned lizards	3	-	-	-	-	-	3
	100.0%	-	-	-	-	-	0.1%
Nonvenomous snakes	6	-	-	-	-	1	7
	85.7%	-	-	-	-	14.3%	0.3%
Frogs and toads	2	-	-	-	-	1	3
	66.7%	-	-	-	-	33.3%	0.1%
Plains spadefoot toad	1	-	-	-	-	-	1
	100.0%	-	-	-	-	-	<0.1%
Total	1042	1	11	127	8	1067	2256
Percent	46.2%	<0.1%	0.5%	5.6%	0.4%	47.3%	100.0%

out a presence during other seasons because late fall to early spring occupations are not as easily demonstrated.

Processing

Evidence of processing, or the results of human activity directed toward extraction of consumable resources from a carcass (e.g., Lyman 1994:294-295), distinguishes remains left by humans from those that have accumulated through other more natural processes. Although the presence of burning and butchering marks, and the amount of breakage, can aid in determining whether and how animals were utilized, none of these provide completely unambiguous evidence. Combined with species characteristics, behavior, and availability, we can begin to distinguish the human-related deposits.

Burning

At least three stages of burning can be distinguished: brown or scorched bone is a superficial burn; charred, smoked or blackened bone occurs when the collagen is carbonized; and white or calcined bone results when all organic material is lost and the bone develops a chalky consistency. Burning can occur before deposition and burial, after deposition and before burial, or after burial if the soils are dry and contain sufficient organic material. Burning results when excessive heat modifies or damages the bone through high temperatures or long exposure. It is generally not the result of cooking (Lyman 1994:384-385).

In the LA 68182 assemblage, burning (Table 32) is relatively rare overall. When found it is most often light or scorched followed by heavy or black burning. Graded burns are extremely rare (only five instances). Clearly, the heavily burned/black and white/calcined bone does not result from cooking and represents either accidental burning or disposal. Lightly scorched and graded burns could indicate roasting, although some of the light brown coloration could also be staining unrelated to burning.

Proportions of burned bone are low compared to other sites in the area. At the Fox Place (Akins 2002) overall burning was about 4.8 percent versus 1.2 percent at LA 68182. Rates for Henderson are about 5.2 percent (John D. Speth, pers. comm., December 1998).

Butchering

Butchering was recorded as variations on cuts, chops, impact breaks, spiral breaks, snap breaks, and split breaks. Like many of the conditions found on bone, their presence is often ambiguous because almost all can result from natural or accidental mechanisms. Marks resembling cuts and abrasions can be produced by hoofed animals, archaeological excavators or preparators, carnivore or rodent gnawing, rockfall, water transport, and soil movement (Gifford-Gonzales 1989:192-193; Lyman 1994:297; Marshall 1989:12; Oliver 1989:89). Likewise, trampling, rockfall, carnivores, water transport, soil compaction also create spiral and other fracture types, as do shrinking and swelling of soils, cryoturbation, and traumatic accidents (Marshall 1989:12,20).

Given the surface condition of the bone and that butchering was not recorded on the rough-sort portion of the assemblage, it is not surprising that many of the conditions that could result from human processing are rare. Potential cuts were observed on only one specimen (a softshell turtle shell), and chops on three (two pronghorn and one bison bone). Impact breaks were more common—the more ambiguous snap (transverse) and split (longitudinal) breaks being the most frequent. Determining which breaks are natural from the data base was not possible, so the data presented in Table 33 contain an undetermined amount of natural breakage.

Fragmentation

Some of the ways that bone can become fractured are processing for marrow, rendering a piece small enough to fit into a cooking pot, trampling by humans and artiodactyls, chewing by carnivores, and by sediment weight and movement. Bone grease (marrow) is probably the most dependable source of fat in large mammals. In order to retrieve the fat, the bone tissue must be largely destroyed. Processing involves smashing bones into small fragments, cooking the fragments in water, then skimming the fat off the surface of the water (Brink 1997:259-260). Bone grease is a dependable and nutritious food, and may have been important in helping populations though seasons when other resources were sparse, thus helping prevent severe nutritional stress (Brink 1997:271). The presence of large amounts of fragmented bone, especially from large mammals, is good evidence that a group was maximizing the use of its food resources.

When reviewed in conjunction with other variables, such as burning, element completeness (Table 34) can provide information on whether a taxon was processed and used by humans. Observations made on 1,100 specimens indicate that almost half of the assemblage consists of less than a quarter of the element, and that a further 29 percent consist of less than half. Taxa with the

Table 32. LA 68182: burning.

	None	Light	Heavy	Graded	Calcined	Total Burned
Mammal	154	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Unknown small	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Small mammal	1096	2	1	-	-	3
	99.7%	0.2%	0.1%	-	-	0.3%
Medium mammal	2874	2	2	-	-	4
	99.9%	0.1%	0.1%	-	-	0.1%
Large mammal	3680	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Rodent	9	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Ground squirrels	3	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Black-tailed prairie dog	268	13	10	-	-	23
	92.1%	4.5%	3.4%	-	-	7.9%
Pocket gophers	6	2	1	-	-	3
	66.7%	22.2%	11.1%	-	-	33.3%
Plains pocket gopher	2	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Yellow-faced pocket gopher	19	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Banner-tailed kangaroo rat	8	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Northern grasshopper mouse	2	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Hispid cotton rat	3	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Woodrats	10	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Muskrat	32	3	-	-	-	3
	91.4%	8.6%	-	-	-	8.6%
Porcupine	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Rabbits	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Desert cottontail	345	37	17	1	1	56
	86.0%	9.2%	4.2%	0.2%	0.2%	14.0%
Black-tailed jackrabbit	147	14	2	-	-	16
	90.2%	8.6%	1.2%	-	-	9.8%
Dog, coyote, wolf	28	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Raccoon	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Weasels and allies	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Striped skunk	6	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Artiodactyl	553	3	1	1	-	5
	99.1%	0.5%	0.2%	0.2%	-	0.9%
Deer	29	-	1	-	-	1
	96.7%	-	3.3%	-	-	3.3%
Pronghorn	86	1	-	-	-	1
	98.9%	1.1%	-	-	-	1.1%
Bison	45	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Bos /bison	34	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Birds	15	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Ducks	2	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Turkey	4	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
American coot	2	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Pigeons and doves	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Small perching birds	2	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Turtles and tortoises	148	-	-	1	-	1
	99.3%	-	-	0.7%	-	0.7%
Snapping, musk, mud turtles	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Snapping turtle	6	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Yellow mud turtle	133	-	2	-	-	2
	98.5%	-	1.5%	-	-	1.5%
Box or water turtles	2	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Painted turtle	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Pond slider	2	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Western river cooter	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Ornate box turtle	3	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Spiny softshell	14	-	-	2	-	2
	87.5%	-	-	12.5%	-	12.5%
Horned lizards	3	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Nonvenomous snakes	7	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Frogs and toads	2	1	-	-	-	1
	66.7%	33.3%	-	-	-	33.3%
Plains spadefoot	1	-	-	-	-	0
	100.0%	-	-	-	-	0.0%
Totals	9794	78	37	5	1	121
	98.8%	0.8%	0.4%	0.1%	<0.1%	1.2%

most complete bones are generally those least likely to be human food sources—small rodents, snakes, and toads. Larger body sizes (artiodactyls) have the most fragmented bones, and the intermediate species, like the rabbits and prairie dogs, fall between. Because so much of the assemblage was only rough-sorted, the data base is limited and does not allow for detailed analysis of breakage and utilization of body parts.

Table 33. LA 68182: potential processing by taxon.

	Cuts	Chopped	Impact	Spiral	Snap	Split	Total Percent
Mammal	-	-	-	-	1	9	10
	-	-	-	-	10.0%	90.0%	1.1%
Small mammal	-	-	-	-	12	10	22
	-	-	-	-	54.5%	45.5%	2.3%
Medium mammal	-	-	-	-	11	6	17
	-	-	-	-	64.7%	35.3%	1.8%
Large mammal	-	-	-	-	2	10	12
	-	-	-	-	16.7%	83.3%	1.3%
Rodent	-	-	-	-	1	1	2
	-	-	-	-	50.0%	50.0%	0.2%
Ground squirrels	-	-	-	-	2	-	2
	-	-	-	-	100.0%	-	0.2%
Black-tailed prairie dog	-	-	-	-	57	11	68
	-	-	-	-	83.8%	16.2%	7.2%
Pocket gophers	-	-	-	-	8	-	8
	-	-	-	-	100.0%	-	0.8%
Plains pocket gopher	-	-	-	-	1	-	1
	-	-	-	-	100.0%	-	0.1%
Yellow-faced pocket gopher	-	-	-	-	2	-	2
	-	-	-	-	100.0%	-	0.2%
Banner-tailed kangaroo rat	-	-	-	-	3	1	4
	-	-	-	-	75.0%	25.0%	0.4%
Hispid cotton rat	-	-	-	-	2	-	2
	-	-	-	-	100.0%	-	0.2%
Muskrat	-	-	-	-	4	2	6
	-	-	-	-	66.7%	33.3%	0.6%
Desert cottontail	-	-	-	-	116	39	155
	-	-	-	-	74.8%	25.2%	16.4%
Black-tailed jackrabbit	-	-	-	1	28	34	63
	-	-	-	1.6%	44.4%	54.0%	6.7%
Dog, coyote, wolf	-	-	-	-	1	6	7
	-	-	-	-	14.3%	85.7%	0.7%
Striped skunk	-	-	-	-	2	-	2
	-	-	-	-	100.0%	-	0.2%
Artiodactyl	-	-	1	-	1	451	453
	-	-	0.2%	-	0.2%	99.6%	48.0%
Deer	-	-	1	-	-	20	21
	-	-	4.8%	-	-	95.2%	2.2%
Pronghorn	-	2	11	-	2	29	44
	-	4.5%	25.0%	-	4.5%	65.9%	4.7%
Bison	-	1	-	2	-	5	8
	-	12.5%	-	25.0%	-	62.5%	0.8%
Bos/bison	-	-	2	1	-	12	15
	-	-	13.3%	6.7%	-	80.0%	1.6%
Birds	-	-	-	-	7	2	9
	-	-	-	-	77.8%	22.2%	1.0%
Ducks	-	-	-	-	1	-	1
	-	-	-	-	100.0%	-	0.1%
Turkey	-	-	-	-	1	-	1
	-	-	-	-	100.0%	-	0.1%
American coot	-	-	-	-	1	-	1
	-	-	-	-	100.0%	-	0.1%
Turtles and tortoises	-	-	-	-	1	1	2
	-	-	-	-	50.0%	50.0%	0.2%
Spiny softshell	1	-	-	-	2	-	3
	33.3%	-	-	-	66.7%	-	0.3%
Frogs and toads	-	-	-	-	2	-	2
	-	-	-	-	100.0%	-	0.2%
Plains spadefoot	-	-	-	-	1	-	1
	-	-	-	-	100.0%	-	0.1%
Total	1	3	15	4	272	649	944
Percent	0.1%	0.3%	1.6%	0.4%	28.8%	68.8%	100.0%

Table 34. LA 68182: completeness by taxon.

	Indeterminate	100%	>75%	50-75%	25-50%	<25%
Mammal	-	-	-	-	1	26
	-	-	-	-	3.7%	96.3%
Unknown small	1	-	-	-	-	-
	100.0%	-	-	-	-	-
Small mammal	1	3	3	-	21	47
	1.3%	4.0%	4.0%	-	28.0%	62.7%
Medium mammal	1	1	-	-	9	21
	3.1%	3.1%	-	-	28.1%	65.6%
Large mammal	-	-	-	-	2	29
	-	-	-	-	6.5%	93.5%
Rodent	-	-	2	1	2	4
	-	-	22.2%	11.1%	22.2%	44.4%
Ground squirrels	-	-	1	-	2	-
	-	-	33.3%	-	66.7%	-
Black-tailed prairie dog	-	10	72	5	156	48
	-	3.4%	24.7%	1.7%	53.6%	16.5%
Pocket gophers	-	1	3	1	4	-
	-	11.1%	33.3%	11.1%	44.4%	-
Plains pocket gopher	-	-	2	-	-	-
	-	-	100.0%	-	-	-
Yellow-faced pocket gopher	-	-	8	-	10	1
	-	-	42.1%	-	52.6%	5.3%
Banner-tailed kangaroo rat	-	-	4	1	3	-
	-	-	50.0%	12.5%	37.5%	-
Northern grasshopper mouse	-	1	1	-	-	-
	-	50.0%	50.0%	-	-	-
Hispid cotton rat	-	-	1	-	2	-
	-	-	33.3%	-	66.7%	-
Woodrats	-	1	5	-	4	-
	-	10.0%	50.0%	-	40.0%	-
Muskrat	-	4	21	-	10	-
	-	11.4%	60.0%	-	28.6%	-
Porcupine	-	1	-	-	-	-
	-	100.0%	-	-	-	-
Rabbits	1	-	-	-	-	-
	100.0%	-	-	-	-	-
Desert cottontail	-	35	92	4	235	35
	-	8.7%	22.9%	1.0%	58.6%	8.7%
Black-tailed jackrabbit	-	11	32	-	67	53
	-	6.7%	19.6%	-	41.1%	32.5%
Dog, coyote, wolf	-	5	6	-	11	6
	-	17.9%	21.4%	-	39.3%	21.4%
Raccoon	-	-	1	-	-	-
	-	-	100.0%	-	-	-
Weasels and allies	-	1	-	-	-	-
	-	100.0%	-	-	-	-
Striped skunk	-	-	2	-	4	-
	-	-	33.3%	-	66.7%	-
Artiodactyl	1	-	4	-	23	530
	0.2%	-	0.7%	-	4.1%	95.0%
Deer	-	2	2	1	9	16
	-	6.7%	6.7%	3.3%	30.0%	53.3%
Pronghorn	-	15	19	-	34	19
	-	17.2%	21.8%	-	39.1%	21.8%
Bison	-	6	14	-	11	14
	-	13.3%	31.1%	-	24.4%	31.1%
Bos/bison	1	3	8	1	7	14
	2.9%	8.8%	23.5%	2.9%	20.6%	41.2%
Birds	-	-	1	-	9	3
	-	-	7.7%	-	69.2%	23.1%
Ducks	-	1	-	-	1	-
	-	50.0%	-	-	50.0%	-
Turkey	-	1	-	-	3	-
	-	25.0%	-	-	75.0%	-
American coot	-	-	-	-	2	-
	-	-	-	-	100.0%	-
Pigeons and doves	-	-	1	-	-	-
	-	-	100.0%	-	-	-
Small perching birds	-	-	2	-	-	-
	-	-	100.0%	-	-	-
Turtles and tortoises	2	-	-	-	3	144
	1.3%	-	-	-	2.0%	96.6%
Snapping, musk, mud turtles	-	-	-	-	1	-
	-	-	-	-	100.0%	-
Snapping turtle	-	-	1	-	4	1
	-	-	16.7%	-	66.7%	16.7%
Yellow mud turtle	-	41	26	-	-	68
	-	30.4%	19.3%	-	-	50.4%
Box or water turtles	-	-	-	-	-	2
	-	-	-	-	-	100.0%
Painted turtle	-	-	-	-	-	1
	-	-	-	-	-	100.0%
Pond slider	-	-	-	-	1	1
	-	-	-	-	50.0%	50.0%
Western river cooter	-	-	-	-	-	1
	-	-	-	-	-	100.0%
Ornate box turtle	-	1	1	-	-	1
	-	33.3%	33.3%	-	-	33.3%
Spiny softshell	-	-	-	-	2	14
	-	-	-	-	12.5%	87.5%
Horned lizards	-	-	1	-	1	1
	-	-	33.3%	-	33.3%	33.3%
Nonvenomous snakes	-	6	1	-	-	-
	-	85.7%	14.3%	-	-	-
Frogs and toads	-	-	1	1	1	-
	-	-	33.3%	33.3%	33.3%	-
Plains spadefoot	-	-	1	-	-	-
	-	-	100.0%	-	-	-
Total	8	150	339	15	655	1100
Percent	0.4%	6.6%	15.0%	0.7%	28.9%	48.5%

Discussion

The taxa represented in the LA 68182 faunal assemblage were evaluated for their potential use by humans by assessing processing variables and species behavior and availability (Table 35). Several species, including some rodents, small carnivores, small birds, snapping turtles, and reptiles and amphibians, lack any evidence of use by humans. Elements are fairly complete, there is no burning, the numbers are small, and their general behavior suggests they are unlikely food sources. Pocket gophers are unlikely food sources because of their small size and burrowing habits—any burning could result from deposition by humans, or bones could have burned accidentally. Other taxa that are likely food sources or could have been used for other purposes, based on behavior, size, and consistent presence in other archaeological assemblages, show no direct evidence of use.

Table 35. LA 68182: taxa counts by potential use as food by humans.

	Unlikely	Unlikely but some Evidence	Probable but no Evidence	Evidence of Use
Ground squirrels	3	-	-	-
Black-tailed prairie dog	-	-	-	291
Pocket gophers	-	30	-	-
Banner-tailed kangaroo rat	8	-	-	-
Northern grasshopper mouse	2	-	-	-
Hispid cotton rat	3	-	-	-
Woodrats	10	-	-	-
Muskrat	-	-	-	35
Porcupine	-	-	1	-
Desert cottontail	-	-	-	401
Black-tailed jackrabbit	-	-	-	163
Dog, coyote, wolf	-	-	28	-
Raccoon	1	-	-	-
Striped skunk	6	-	-	-
Deer	-	-	-	30
Pronghorn	-	-	-	87
Bison/Bos	-	-	-	79
Ducks	-	-	2	-
Turkey	-	-	4	-
American coot	-	-	2	-
Pigeons and doves	-	-	1	-
Small perching birds	2	-	-	-
Snapping turtle	1	-	-	-
Yellow mud turtle	-	-	-	135
Painted turtle	-	-	1	-
Pond slider	-	-	2	-
Western river cooter	-	-	1	-
Ornate box turtle	-	-	3	-
Spiny softshell	-	-	-	16
Horned lizards	3	-	-	-
Nonvenomous snakes	7	-	-	-
Frogs and toads	4	-	-	-
Total	50	30	45	1237

Finally, there are nine taxa that are not only likely food items but have evidence of processing. These fall nicely into three groups: small mammals commonly exploited for food (prairie dogs, cottontails, and jackrabbits), locally available artiodactyls commonly exploited for food (deer, pronghorn, and bison), and aquatic resources that were probably readily available at this location (muskrats, yellow mud and softshell turtles, and mussels). Many of the taxa considered possible food sources, but lacking evidence of being such, fall into the last category (birds and turtles). It is the small mammals and artiodactyls that account for much of the definitely utilized assemblage (84 percent).

Perhaps what is most unusual is the total absence of fish in the LA 68182 assemblage. If aquatic resources were being exploited, why are fish absent? Fish remains are abundant at most other sites in the area—the Fox Place (Akins 2002), Henderson (John D. Speth, personal communication, December 1998), and Rocky Arroyo (Emslie et al. 1992:91). Either the Middle Berrendo River did not support fish, or fish were deliberately ignored in favor of other preferred resources.

As a repeatedly occupied location, this site must have been chosen for its vistas or its proximity to water or some other resource. Those camped at LA 68182 could have pursued any number of subsistence and residential strategies. Three of the more likely alternatives include horticuturalism, extracting resources at this location; mobile hunting and gathering based elsewhere, with a portion of the group extracting resources at this location; and more mobile groups stopping as part of a seasonal round. Being able to distinguish these strictly on the basis of faunal assemblages is unlikely, especially given that degrees of mobility represent more of a continuum than absolute strategies.

However, differences in how task groups on hunting or gathering expeditions and mobile groups exploited faunal resources should be visible in archaeological assemblages. For example, task groups from horticultural villages or mobile groups with base camps located elsewhere should concentrate on the resources they came to procure, leaving little time for other activities. In these sites, the locally available fauna should dominate the assemblage. Mobile groups returning as part of a seasonal round might hunt more opportunistically, resulting in a more diverse faunal assemblage (e.g., Chatters 1987:341).

The LA 68182 faunal assemblage fits better with the latter—a more diverse and opportunistic strategy with evidence of hunting beyond the immediate site area—but it could easily represent an amalgamation of both, given the time span involved. None of the large mammals have body part distributions suggesting they were procured at any great distance so that low-utility parts were left at the kill sites. Yet the relative frequencies and overall patterns of butchering and breakage differ little from those found in sites considered at least somewhat sedentary.

Nearby Henderson Site (A.D. 1275 to 1350) was a semisedentary horticultural, hunting and gathering community. There, cottontail rabbits are the most numerous mammals, bison greatly outnumber deer and pronghorn, and both rodents and birds are less numerous (Rocek and Speth 1986:36-38; Speth 1997:1-3). Driver's (1985:42-46) data from six habitation sites in the Sierra Blanca region (Bonnell, Phillips, Block, Penasco, Hiner, and Bloom) show a variety of strategies whereby rabbits and sometimes prairie dogs, sometimes deer and pronghorn, and sometimes bison comprise the bulk of the faunal assemblages. One is slightly weighted toward rabbits (Bonnell) whereas the rest have more pronghorn and deer with varying amounts of bison and potential bison. Rodents and birds are rare in all.

It is clear that a good deal of work needs to be done before the role of locations like LA 68182 can be understood. The data seem to indicate that, while those camped at LA 68182 took advantage of the fauna available and somewhat unique to the location, the bulk of their animal subsistence needs were met by those taxa commonly exploited by most inhabitants of the greater southwest.

CHAPTER 12

Preliminary Identification of Mussel Shells

REGGE N. WISEMAN

The following analysis was based in part on 25 mussel valve umbos identified by Dr. Arthur Metcalf of the University of Texas at El Paso. These identifications were then used as a study collection for identifying the remainder of the valves in the assemblage. All other identifications were made by Wiseman and must be considered tentative (Appendix 9). All of the specimens identified here are also counted in the tabulations presented in Chapter 11 of this report.

Two mussel species are identified in the LA 68182 assemblage: *Cyrtonaias tampicoensis* [Lea 1838] and *Popenaias popeii* [Lea 1857]. Both species have been documented as resident in the Pecos River system, although today their distribution mainly outside of New Mexico (Metcalf 1982; Cockerell 1902) undoubtedly reflects changes in the Pecos River drainage over the past 125 years. The numerous archaeological specimens of both species at LA 68182 and the Fox Place (Wiseman 2002) clearly documents their former presence in the Roswell area. The important question regarding both species was whether the meat was consumed. The presence of all sizes of both species answers this question in the affirmative.

Cyrtonaias tampicoensis. This mussel is the larger of the two species at LA 68182 and has more massive valves. Accordingly, it is this shell that is used for tools (see artifact section of Chapter 6) as well as a source of ornament material.

Both young and mature individuals are present. Nearly complete valves are uncommon in the LA 68182 assemblage. These specimens are complete only along the dimension from the umbo (hinge) to the opposite edge, the short axis of the complete valve. Assuming that fully mature individuals are represented by the valves used as tools, the size range of mature individuals (umbo to opposite edge) is 50 to 70 mm. The smallest measurable valve in the LA 68182 assemblage is 31 mm, or roughly half the size of mature examples. Mature valves, as represented by the type specimen in the OAS comparative collection, can be as large as 76 mm (umbo to opposite edge), as long as 115 to 120 mm (end to end), and weigh in the order of 85 g.

In terms of identifiable fragments, *C. tampicoensis* appears to be less well represented than *P. popeii* at LA 68182. The 28 identifiable valves (including the three tools) are 16 lefts and 12 rights, for an MNI (minimum number of individuals) of 16.

Popenaias popeii. This mussel is the smaller of the two species at LA 68182. Typically, the valves are less massive than *C. tampicoensis* and are unsuited for use as tools. However, in assemblages from other sites, a limited number of ornaments appear to be made from *P. popeii*. The author suspects that *P. popeii* was used mainly as food.

The wide range in valve sizes indicates nonselective collection. The Los Molinos occupants apparently collected entire mussels, brought them back to the site, and consumed them. In the LA 68182 assemblage, the size range of measurable valves is 23 to 30 mm (umbo to opposite edge), but all of the smaller valves are too fragmentary to measure. Judging by a type specimen in the OAS comparative collection, mature valves can be as large as 34 mm (umbo to opposite edge), have a total length (end to end) in the order of 75 to 80 mm, and weigh 11 g.

In terms of identifiable fragments, *P. popeii* appears to be more common than *C. tampicoensis* at LA 68182. The 38 identifiable valves include 21 lefts and 17 rights, for an MNI of 21.

CHAPTER 13

Flotation Analysis Results from LA 68182

PAMELA J. MCBRIDE

INTRODUCTION

The site is in a typical semidesert grassland biotic community with grasses like the gramas (*Bouteloua* spp.), bush muhly (*Muhlenbergia porteri*), and threeawns (*Aristida* spp.) comprising some of the dominant taxa. Mesquite is the dominant shrub and yucca is the most prominent leaf succulent in semidesert grassland. The Middle Berrendo Creek was formerly a perennial artesian-spring-fed stream. This reliable water source and the arable valley bottomlands would have provided occupants with ample resources to practice agriculture.

Flotation samples were examined from several mortars, a possible hearth, and from 25 contexts within the crevice. The goals of the analysis were to identify possible plant resources that were processed in the mortars, and to identify which plants formed part of the diet of site occupants at LA 68182.

METHODS

Flotation Processing

The 37 soil samples collected during excavation were processed at the Museum of New Mexico's Office of Archeological Studies by the simplified bucket version of flotation (see Bohrer and Adams 1977). Volumes of flotation samples ranged from 0.1 to 6.8 liters. Each sample was immersed in a bucket of water, and a 30- to 40-second interval allowed for settling out of heavy particles. The solution was then poured through a fine screen (about 0.35-mm mesh) lined with a square of chiffon fabric to catch organic materials floating or in suspension. The fabric linings were laid flat on coarse-mesh-screen trays until the recovered material had dried.

Flotation Scan and Full-Sort Analysis

Twenty-nine of the 37 samples were scanned and eight were full-sorted. In scanning, flotation samples are first separated by screening into major particle-size categories using a series of nested geological screens (meshes of 4.0, 2.0, 1.0, and 0.5 mm), and then reviewed under a binocular microscope at 7× to 45×. Scanning involves looking at all material larger than 2.0 mm, and most material larger than 1.0 mm. Corn kernels and cob fragments (relatively common in flotation samples) and bean and squash remains (relatively rare in flotation samples) are almost entirely restricted to these two screen sizes, so that scanning provides a reliable view of the presence or absence of cultivated taxa. Wild taxa recovered in these larger screen sizes may include twigs and seeds or berries from shrubs or trees, large seeds from perennial species like yucca or squawberry, and grass and weed seeds with particularly large seeds, such as ricegrass and beeweed. Most annual weed seeds are caught in the 0.5-mm screen, which is usually examined partially in the scanning procedure. Plant remains are recorded as an estimated number of seeds or fruits per liter of soil floated.

Scanning accurately picks up the presence of higher-frequency weed taxa, such as the chenopods, pigweed, and purslane. Among the material that passes through the smallest screen size, botanical remains are often completely absent or else consist of fragments of seed types encountered in larger screens. Rarely, low frequencies of small seed types, such as tansy mustard or dropseed, will occur in the smallest screens without also occurring in the larger screens. For the time invested, then, scanning provides relatively reliable presence/absence flotation data, as well as general information about relative quantities of specific taxa and about whether carbonized specimens are present. Indicators of postdepositional disturbance (modern roots and other vegetative parts, insect exoskeleton fragments, rodent and insect scats) are also noted.

The major difference between scan and full-sort analysis is that in the full-sort analysis the absolute number of seeds identified is recorded and the material in screen sizes smaller than 2 mm is not always subsampled. Absolute counts are obviously a more precise record of archaeobotanical remains present at a site, in that they provide an exact number of charred seeds rather than an estimate of seeds per liter of floated soil.

Results

Examination of flotation samples from nine mortars revealed the presence of uncharred weedy taxa (Table 36) that were probably part of the windblown fill of the features, and should be considered modern in origin. Annual, grass, and other cultural plant remains recovered from various contexts in the crevice consisted of charred goosefoot, purslane, sunflower, bulrush, mustard, dropseed grass, composite family, milkvetch, scorpionweed, and plantain seeds (Tables 36 and 37). The adaptive advantage that weedy annuals like goosefoot and purslane have of proliferating in the disturbed ground around habitation sites, agricultural fields, and middens makes them a readily available resource, and their seeds have been recovered from a wide array of prehistoric assemblages. The oil-rich seeds of the sunflower were an important source of food and oil. The ground seeds could be boiled until the oil rose to the surface and could then be skimmed off. The seeds were parched and eaten whole, hull and all, or ground into meal (Harrington 1967:314).

The ground seeds of dropseed grass were used by the Navajo to make dumplings, rolls, and griddle cakes, and the Hopi ground the seeds and mixed them with cornmeal (Castetter 1935:28). Even though dropseed grass grains are very small, the positive qualities of abundant seed production and the retention of the grains by the plant after maturation, preventing their loss before harvesting (Doebley 1984), suggest that dropseed could have been a significant food resource.

Bulrush was the only representative of riparian plant use. Bulrush was used extensively by many Native American groups. The young shoots were eaten raw or cooked, the pollen was collected when the plant was in flower and mixed with meal, the stems were used to make baskets or mats, and the seeds were ground into a meal (Harrington 1967:212).

Maize was the sole cultigen identified in flotation samples. Carbonized maize cupules were recovered from seven contexts within the crevice (Tables 36 and 37).

Discussion

The weedy annual floral assemblage from LA 68182 is similar to those from other sites in the area that were occupied in the ceramic period (Table 38). This assemblage's dearth of perennial species with documented economic uses represents a marked difference between LA 68182 and other sites. With the exception of Bent, other sites in the area listed in Table 38 are roomblocks, shelters, or pithouse villages. Differences in site function and preservation may be a factor here. LA 68182 may have been a seasonally occupied site where maize was grown in the valley below and processed in the grinding features in the bedrock hill above the fields. Weedy annuals that could have been easily collected growing in the disturbed ground of agricultural fields were utilized along with plants like bulrush that were growing along Middle Berrendo Creek. Yucca fruits, cactus fruits, and mesquite beans may have ripened after the maize harvest or were not worth the time expenditure when maize production and harvest was the major focus of the site occupants.

At the Sunset Archaic Site and Tintop Cave, differences in procurement strategies over time might be indicated. An expansion of the plant spectrum utilized can be seen in conjunction with an increase in the number of perennials identified for the ceramic period as compared to the perennial assemblage of the Archaic. However, Toll (1996:46) suggests caution in the assessment of any perceived subsistence differences due to unclear stratigraphy at the shelter (LA 71167), and differential preservation biases between the shelter deposits and the deposits at LA 58971, an open site with an Archaic period occupation. If the pattern of increasing use of perennials through time conforms to future studies, the pattern of plant use at LA 68182 is more consistent with that of the Archaic. This could lend further support to the argument that activities were of a specialized nature at LA 68182.

Summary

Flotation samples examined from trash fill of a crevice in the bedrock produced evidence that site occupants were practicing maize agriculture and targeting weedy annuals that could have been gathered while tending agricultural fields. Charred bulrush seeds were the sole representatives of perennial and riparian economic resources. The scarcity of perennial plant remains along with the presence of numerous bedrock grinding features indicate a focus on maize agriculture and a seasonal use of the site where fall-ripening resources like yucca fruits and mesquite beans were absent from the record. Flotation samples from the mortars did not produce information on the use of these features.

Table 36. LA 68182: flotation scan results.

Context	Charcoal Lens in Crevice	Bedrock Feature 9	17	20	27	32	33	Hearth
FS No.	447	564	571	574	581	585	586	652
Noncultural								
Annuals								
Mentzelia (stickleaf)	-	-	-	-	-	-	-	+
Other								
Euphorbia (spurge)	+	-	+	+	+	-	+	+
Physalis (groundcherry)	-	+	-	-	+	+	+	-
Portulacaceae (portulaca family)	-	+	-	+	+	-	+	+

Context	Crevice							
Provenience	21N 14W			25N 25W	21N 17W			
FS No.	927	929	931	933	935	938	940	942
Cultural								
Annuals								
Chenopodium (goosefoot)	check sample	-	-	-	-	-	-	-
cheno-am	-	-	-	-	-	-	-	+*
Helianthus (sunflower)	+*	-	-	-	-	+*	-	-
Helianthus petiolaris (prairie sunflower)	-	-	+*	-	-	-	-	-
Cultigens								
Zea mays (maize)	-	-	-	-	-	-	-	cupule+*
Perennials								
Scirpus (bulrush)	-	-	-	-	-	-	+*	-
Undetermined	embryo+*	-	-	-	embryo+*	-	-	-
Noncultural								
Annuals								
Chenopodium (goosefoot)	-	+	-	+	+	-	-	+
cheno-am	-	-	-	-	-	+	-	-
Portulaca (purslane)	-	+	-	-	-	-	-	-
Salsola kali (Russian thistle)	-	-	-	capsule+	-	-	-	-
Other								
Compositae (sunflower family)	+	-	-	-	-	-	-	-
Cryptantha	-	-	-	-	+	-	-	-
Euphorbia (spurge)	+	-	-	-	+	-	-	-

Context	Crevice							
Provenience	22N 24W					23N 10W		25N 21W
FS No.	944	946	948	950	952	954	957	1012
Cultural								
Annuals								
Chenopodium (goosefoot)	-	-	-	-	+*	-	-	-
Helianthus (sunflower)	-	-	-	-	+*	-	-	-
Cultigens								
Zea mays (maize)	cupule+*	-	cf. cupule+*	cf. cupule+*	cf. cupule+*	-	-	-
Other								
Descurainia (tansymustard)	-	+*	-	-	-	-	-	-
Perennials								
Scirpus (bulrush)	-	-	-	+*	-	-	+*	-
Undetermined	-	-	-	+*	+*	+*	-	-
Noncultural								
Annuals								
Chenopodium (goosefoot)	-	+	-	-	-	+	+	+
Portulaca (purslane)	+	-	-	-	-	-	-	+
Other								
Euphorbia (spurge)	+++	+	-	-	-	+	+	-
Kallstroemia (caltrop)	-	-	-	-	-	+	-	-
Oenothera (evening primrose)	+	-	-	-	-	-	-	-
Portulacacaceae (portulaca family)	-	-	-	-	-	-	+	-
Undetermined	+	-	-	-	-	-	+	-
Perennials								
Sphaeralcea (globe mallow)	-	+	-	-	-	-	-	-

* = charred. + = 1-10/liter. +++ = >25/liter. cf. = compares favorably.

Table 37. LA 68182: flotation full-sort results.

Context	Crevice							
Provenience	21N 13W				22N 11W		21N 16W	
FS No.	1048	1049	1050	1051	1052	1053	1064	1065
Cultural								
Annuals								
Chenopodium (goosefoot)	-	1*	-	-	-	-	-	1*
Portulaca (purslane)	-	-	-	-	-	-	-	3*
Cultigens								
Zea mays (maize)	-	-	cupule+*	-	-	cupule+*	-	-
Grasses								
Sporobolus (dropseed)	-	5*	1*	2*	-	-	-	-
Other								
Compositae (sunflower family)	-	1*	-	-	-	-	-	-
Phacelia (scorpionweed)	-	-	-	2*	-	-	-	-
Plantago (plantain)	-	-	-	-	-	-	-	1*
Undetermined	-	-	-	-	1*	-	1*	2*
Perennials								
Astragalus (milkvetch)	-	-	-	-	1*	-	-	-
Noncultural								
Annuals								
Amaranthus (pigweed)	-	-	-	-	1	-	-	-
Chenopodium (goosefoot)	3	2	8	4	26	4	-	5
Mentzelia (stickleaf)	-	-	-	-	1	-	1	3
Mollugo (carpetweed)	-	-	-	-	2	-	-	2
Portulaca (purslane)	-	-	-	-	91	35	-	-
Salsola kali (Russian thistle)	-	-	-	-	-	1*	-	-
Grasses								
Graminae (grass family)	-	-	-	-	-	2	-	2
Sporobolus (dropseed)	-	1	1	2	-	-	1	6
Other								
Boraginaceae (borage family)	-	-	-	-	1	-	2, 1 fruit	4
Descurainia (tansymustard)	-	-	-	-	3	3	-	2
Euphorbia (spurge)	8	13	108	71	19	2	8	11
Oenothera (evening primrose)	-	-	-	1	-	1	-	-
Physalis (groundcherry)	3	-	1	-	2	1	-	-
Unknown no. 1196	-	-	-	-	-	1	-	1
Perennials								
Opuntia (prickly pear cactus)	-	-	-	-	-	-	1	1

* = charred.   + = 1-10/liter.

Table 38. Charred plant remains from Archaic and ceramic period sites in southeastern New Mexico.

Site	Sunset Archaic Site (LA 58971)[1]	Tintop Cave (LA 71167) Stratum 4 Levels 8, 9[1]	Fox Place[2]	Henderson[3]	Bent[4]	Tintop Cave (LA 71167)[1]	Abajo de la Cruz[5]	Robinson Pueblo[6]	Angus North[7]	Los Molinos (LA 68182)
Date	A.D. 1-400?	Unknown	Thirteenth Century	A.D. 1275-1325	A.D. 800-1000 1100-1200	A.D. 1100?-1250	A.D. 1150-1350	A.D. 1150-1400	A.D. 1150-1350	A.D. 1000-1350
Annuals										
Amaranthus (pigweed)	-	+	+	+	-	-	-	+	+	-
Chenopodium (goosefoot)	+	+	+	+	-	+	+	+	+	+
Cleome (beeweed)	-	-	-	-	-	-	-	+	-	-
Helianthus (sunflower)	-	+	-	-	-	-	-	+	+	+
Nicotiana (tobacco)	-	+	-	+	-	+	-	-	-	-
Portulaca (purslane)	+	+	+	+	-	+	+	+	+	+
Cultigens										
Cucurbita (squash)	-	-	-	+	-	-	+	+	+	-
Gossypium (cotton)	-	-	-	+	-	-	-	-	-	-
Phaseolus (bean)	+	-	-	+	-	+	-	+	-	-
Zea mays (maize)	+	+	+	+	+	+	+	+	+	+
Grasses										
Sporobolus (dropseed)	+	+	+	+	-	-	-	-	-	-
Other										
Compositae (sunflower family)	-	-	+	+	-	-	-	+	-	+
Descurainia (tansymustard)	+	-	-	+	-	-	-	+	-	+
Euphorbia (spurge)	-	-	+	-	-	-	-	-	-	-
Phacelia (scorpionweed)	-	-	-	-	-	-	-	-	-	+
Physalis (groundcherry)	-	-	+	+	-	-	-	+	-	-
Plantago (plantain)	-	-	-	-	-	-	-	-	-	-
Polygonum (knotweed)	-	-	+	-	-	-	-	-	-	-
Salvia (sage)	-	-	-	+	-	-	-	-	-	-
Perennials										
Argemone (prickly poppy)	-	-	-	+	-	-	-	-	-	-
Atriplex (saltbush)	-	-	-	-	-	-	+	+	-	-
Celtis (hackberry)	-	-	-	+	-	-	-	-	-	-
Echinocereus (hedgehog cactus)	-	+	-	+	-	+	+	-	+	-
Juglans (walnut)	-	-	-	+	-	+	-	+	-	-
Juniperus (juniper)	-	-	-	-	-	-	-	+	+	-
Pinus edulis (piñon)	+	-	-	-	-	-	+	+	+	-
Prosopis (mesquite)	+	-	-	+	+	-	+	-	-	-
Opuntia (prickly pear/cholla)	-	-	-	+	-	+	+	+	-	-
Rhus trilobata (lemonadeberry)	+	-	-	+	-	+	-	-	-	-
Rumex (dock)	-	-	-	+	-	-	-	-	-	-
Scirpus (bulrush)	-	-	-	-	-	-	-	-	-	+
Sphaeralcea (globe mallow)	-	-	-	-	-	+	-	-	-	-
Vitis (grape)	-	-	-	+	-	+	+	-	-	-
Yucca baccata (banana yucca)	-	-	+	+	-	+	-	+	-	-

+ = present.

[1]Toll 1996.

[2]Toll 1993.

[3]Huckell 2003.

[4]Minnis et al. 1982.

[5]Minnis et al. 1982; Ford 1975.

[6]Adams 1991.

[7]Struever and Donaldson 1980.

CHAPTER 14

Human Burial at LA 68182

NANCY J. AKINS

The human bone recovered from LA 68182 appears to represent a single individual, a female probably between 16 and 18 years of age. Although the majority of bone was recovered between 60 and 89 cm deep in square 20N 13W, parts were widely scattered ranging from 19N to 21N, 10W to 18W, and from Level 1 to Level 9 (Table 39).

Methods

The human remains from LA 68182 were analyzed and recorded following the protocol established in *Standards for Data Collection from Human Skeletal Remains* (Buikstra and Ubelaker 1994). Photographs and forms are on file at the Office of Archaeological Studies in Santa Fe.

Taphonomy

Most of the bone was in fair condition with a good deal of breakage. Few long bones had intact ends and many had multiple breaks that were mostly jagged transverse suggesting breakage long after interment. Few breaks had smooth breaks that could have occurred before or soon after burial. These were usually flat bones such as

Table 39. LA 68182: distribution of human bone not collected as part of Burial 1.

FS No.	Grid N	Grid W	Level	Parts
426	20	14	4	M_2
715	20	18	2	L ulna shaft frag; M_3; C vert frags
716	20	13	3	M_1
734	20	13	7-9	rib frags; metatarsal/metacarpal frag; cranial case frags; orbit frag; hand phalanx 3; M_2, LI_2-RI_1
740	20	13	9	PM_2; C vert frag; carpal frag; sacrum frag
760	20	12	1	thumb phalanx 3
766	20	12	5	L temporal; rib frags
768	20	12	6	R occipital frag; cranial case frag
770	20	12	7	rib frags
771	20	12	7	R humerus proximal shaft; rib frags
772	20	12	8	rib frags; C vert frags; T vert frags; tarsal frag; mandibular C
778	20	11	4	hand phalanx 1
781	20	11	7	R scapula blade frag
785	20	11	8	rib frag
788	21	12	2	hand phalanx 3
790	21	12	3-4	rib frag
809	20	10	4	T or L vert arch frag
824	21	10	9	hand phalanx 2
908	19	14	4	thumb phalanx 3
914	19	13	3	PM_1
986	20	16	5	hand phalanges 2 and 3

cranial case fragments and the ilium. Marks resembling carnivore bite marks were observed on the distal right humerus and the proximal ends of both ulnae. Rodent gnawing was present on at least one radius and femur shaft. In addition, the same femur has fine transverse scratches on the anterior aspect that could be from rodent activity or could be abrasions.

Most body parts are represented. Those completely absent are those least likely to be preserved, the spongy ends of long bones, parts of the pelvis, vertebral bodies, and sternum. Much of the cranium is missing, probably not due to preservation. Those pieces found are solid bone but widely scattered.

Age and Sex

Several epiphyses were in the process of fusing when this individual died. Bones with missing epiphyses, indicating an earlier state of fusion, include the superior and inferior rings on the one lumbar vertebral body present, the sternal end of the left clavicle, and the distal ends of the left radius and ulna. Others are incompletely or recently fused: the iliac crest, ischial tuberosity, and the femur head and lesser trochanter. Given the ages when fusion occurs and considering that females tend to mature one to two years before males (Buikstra and Ubelaker 1994:42), the estimated age of this individual is between 16 and 18 years. Additional support for a young individual is found in the teeth. One tooth root (a mandibular M_3) remains open at the apex, indicating an individual less than 21 years of age (1994:51). Dental wear is minimal, again suggesting a young adult.

Although fragmentary, a portion of the left innominate indicates a wide sciatic notch typical of females. None of the other features generally used to determine sex from the pelvis are preserved. On the cranium, the nuchal crest of the occipital is extremely smooth, possibly due in part to the young age. The mastoid process is small and the mental eminence on the mandible on the small side, both suggesting a female. Overall, the elements from this individual are quite gracile and consistent with those of a young female. Two young females from the Henderson Site are gracile with smooth nuchal crests, small mastoids, some development of the mental eminence (Rocek and Speth 1986:76,133,149).

Dentition

Ultimately, much of the dentition from this individual was recovered. Missing are seven maxillary teeth (R M^1 through I^1 and L M^3) and one mandibular incisor (R I_2). Parts of the left maxilla and mandible were intact and held teeth; the remainder were scattered throughout the deposits.

No caries were found in the teeth recovered. Because carbohydrate foods are linked to increases in cariogenous bacteria, caries frequencies increase with the amount of carbohydrates in the diet. As a result, populations relying on a hunter-gatherer strategy have far lower caries rates than populations who depend largely on horticultural products for their subsistence (Buikstra and Ubelaker 1994:47; Martin 1994:94; Martin et al. 2001:2.32; Powell 1985:313, 320; Rose et al. 1984:282). Although the young age of this individual may contribute to the absence of caries, a similar-aged individual (17-20 years) from Henderson (F 8) has caries in both lower second molars, another (F 40, aged 17-23) has no caries, a third (F 36, aged 19-22) has small caries on 2 to 3 teeth, and one slightly older (F 41, aged 21-41) has 3 possible small caries (Rocek and Speth 1986:76, 125-126, 132-134, 139). Given that generalizations based on a population of one are tenuous at best, and that at least one individual of a similar age from Henderson also had no caries, no conclusions on diet can be reached from the LA 68182 individual.

Dental attrition, a normal nonpathological process, is related to food-processing methods and the consumption of coarser foods (Buikstra and Ubelaker 1994:49; Powell 1985:312). Attrition is light for this individual. Many teeth exhibit no wear at all, and most wear is on the first molars where cusps are flattened but dentine exposure minimal. Although some of this is due to the young age of the individual, age-matched data (for 16- to 20-year-olds) from protohistoric sedentary populations at Hawikku and San Cristobal show more molar wear than found on the LA 68182 burial. At both these sites (13 and 18 individuals), molar wear ranged from facets on at least half of the occlusal surface to the presence of enamel rings only, with a mean value indicating most had dentine exposed on one to two cusps (Stodder 1990:191-192). For the LA 68182 individual, the greatest wear recorded for the mandibular molars is teeth worn flat with only a dot of dentine exposed and most cusps of the second and third molars showing no wear at all. From Henderson, F 8 (17 to 20 years), F 36 (19 to 22 years), and F 40 (19 to 22 years) have only slight attrition, whereas the slightly older F 41 (21 to 24 years) has slight to moderate attrition (Rocek and Speth 1986:75, 125-126, 132-134, 139, 172).

Enamel defects, indicative of periods of metabolic or nutritional disruption, or both, while the teeth are forming, provide information on an individual's health between the ages of about 6 months in utero and seven years of age (Goodman et al. 1987:8; Martin 1994:94). Linear horizontal grooves or hypoplasias, linear horizontal pits, nonlinear arrays of pits, and single pits were fairly abundant on teeth from this individual. Linear hypoplasias are the most numerous (n=15 on 9 teeth), followed by arrays of pits (n=4), isolated pits (n=4), and linear pits (n=3). Most teeth, if they had defects (11 did not) had more than one (n=8). Applying regression equations to estimate the age when the linear hypoplasias developed (following Martin et al. 2001:Table 2.3) to the 15 grooves observed, reveals almost continuous episodes of stress from age 2 through 6.5 years (Table 40).

Table 40. LA 68182: estimated age for development of linear enamel hypoplasias for Burial 1.

Age range (years)	No. of Linear Hypoplasias
2.1-2.5	2
2.6-3.0	2
3.1-3.5	1
3.6-4.0	2
4.1-4.5	3
4.6-5.0	0
5.1-5.5	3
5.6-6.0	1
6.1-6.5	1

The onset of linear hypoplasias often marks the age of weaning when a child loses the nutritional and immunological advantages conferred by maternal antibodies acquired during breastfeeding (Goodman et al. 1987:17; Martin et al. 2001:4.16). The data here suggest that chronic stress began soon after weaning in this individual and continued throughout the period reflected in the development of these teeth.

Dental hypoplasias were not recorded for the Henderson Site burials. However, Rocek and Speth (1986:164-165) do note the presence of faint lines on the anterior dentition of most individuals, especially F 8, F 25, and F 41. They attribute the low attrition rates to the use of limestone for metates and suggest that the wear planes and presence of calculus indicate a considerable agricultural component in the diet.

No dental anomalies were noted. In the maxillary dentition, shoveling was fairly evident (scale 5 of 7) and hypocones are present on R M^2 and L M^1. Mandibular molars generally have a + cusp pattern (one has a Y). Cusp numbers range from four to six, the six found on the R M_3.

Pathologies

Few pathologies were found. This may be due in part to the fragmentation of many body parts and absence of others. Both parietals and orbits are missing, so indications of porotic hyperostosis could not be made except on a portion of the occipital where none was present. Well-healed periostitis is present on both tibiae and fibulae.

Generalized periosteal reactions result from systemic or chronic infections rather than from acute conditions that cause rapid death. These increase with population density, interregional contact, exposure to wild and domestic animals, and low resistance among malnourished or otherwise stressed individuals (Stodder 1989:181-182). In the LA 68182 burial, this was manifest as scattered, well-rounded pores with no elevation, mostly on the lower half of the elements. On the lateral shaft of the left fibula, a small (8.2 by 2.2 mm) elevated area of woven bone remains. The advanced remodeling of the lesions suggests that the condition causing the lesions was in the individual's past, and certainly not responsible for her death. Similar slight periostitis was found in a 26- to 30-year-old male (F 25) from Henderson (Rocek and Speth 1986:99).

The only other pathology is a multifocal lesion about a centimeter in diameter on the anterior neck of the left femur. A similarly roughened and porous area lies just above this lesion on the margin of the femoral head. All lesions are well-rounded indicating advanced healing. This probably resulted from overextension or strain on the iliofemoral ligament of the joint capsule. The corresponding portion of the acetabulum was not recovered.

Metric Observations

All possible measurements were taken following Buikstra and Ubelaker (1994:69-84). Table 41 gives these measurements as well as comparable ones from the Henderson Site. All measurements from the LA 68182 burial fall within the range for Henderson.

Physical Activity

Although young, the LA 68182 burial has a few areas where repetitive strain has led to changes in the bone that can give us some insight on activities performed by this individual (e.g., Bridges 1996:112). Moderate crests are present on the lateral aspect below the lesser trochanter on the femur, and the gluteus maximus attachment is slightly rugose, possibly indicating at least a relatively mobile lifestyle. On the humerus, there is little development of the deltoid tuberosity but a crest on the anterior aspect of the upper shaft is developed. On the ulna, the area just below the radial notch has a strong crest. The conoid tubercle on the clavicle is also well developed. The clavicle and arm development could suggest that this individual did more lifting than is associated with grinding of foodstuff.

On a general level, external dimensions correlate with long-bone strength, and long-bone shape reflects mobility. Agricultural populations have more rounded cross-sections than hunter-gatherers (Bridges 1996:112, 118-119). Anteroposterior/mediolateral indices for the midshaft of the femur and proximal end of tibia were calculated for the LA 68182 burial and the Henderson population and compared to a moderately mobile population from the Galisteo Basin (LA 3333, dating to the early 1200s), and to a sedentary agricultural group from a number of sites (dating from about 1000 to 1225 A.D.) along the La Plata River in the San Juan Basin (Table 42).

Interestingly, the LA 68182 femur index shows it is less round (1.0 is round) than any of the Henderson females and the La Plata females and males. Two of the Henderson males have smaller indices, as do some males and females from Galisteo. Yet the tibia index is the smallest of all female groups but within the ranges of all groups. These indices seem to indicate that, for males, the Henderson sample is the most mobile of the three groups; for the females it is Galisteo. When both males and females are considered, the most mobile (highest femur index) are the Henderson males, and the least mobile are the La Plata males, whereas the tibia index is highest for Galisteo females and lowest for La Plata females. Thus, these data lend support to Speth's (1997:3) conclusion that the Henderson Site was occupied by a semisedentary farming-hunting community.

Conclusions

Although a sample of one, a good deal of information can be gained from this individual. This young female experienced repeated episodes of stress during child-

Table 41. Measurements from LA 68182 and Henderson burials.

		Henderson Site (Feature Number)							
Measurement (mm)	LA 68182	1	8	21	25	29	36	40	41
Mastoid length	25.00	27.1	21.6	26.2	34.2	-	30.4	23.7	33.2
Chin height	29.50	32.2	31.2	-	33.0	-	36.8e	32.3e	33.8
Mandibular body height	30.53	-	-	-	-	-	-	-	-
Mandibular body breadth	10.15	-	-	-	-	-	-	-	-
Minimum ramus breadth	33.88	32.3	35.0	36.0	30.9	-	35.9	36.3	32.7
Maximum ramus breath	41.67	-	-	-	-	-	-	-	-
Maximum ramus height	54.23	63.7	55.0	64.2	66.6	-	66.3	52.4	69.8
Mandibular length	84.86	-	-	-	-	-	-	-	-
Mandibular angle	116	-	-	-	-	-	-	-	-
Radius maximum length	228	230	214	253	263	-	261R	219Re	254
Radius A-P dia at midshaft	10.09	-	-	-	-	-	-	-	-
Radius M-L dia at midshaft	13.53	-	-	-	-	-	-	-	-
Ulna A-P diameter at midshaft	14.38R	-	-	-	-	-	-	-	-
Ulna M-L diameter at midshaft	11.17R	-	-	-	-	-	-	-	-
Ulna minimum circumference	30	30	31	34	36	-	32	30	30
Femur maximum diameter of head	39.12e	40.0	39.0	42.0	49.0	-	50.0e	38.0	47.0
Femur A-P subtrochanter dia	21.16	25.0	21.0	25.0R	27.0	-	27.0	21.0	26.0
Femur M-L subtrochanter dia	28.06	30.0	29.0	31.0R	34.0	-	32.0	28.0R	34.0
Femur A-P midshaft dia	27.80e	27.0R	24.0	33.0R	33.0	32.0e	33.0	26.0	32.0
Femur M-L midshaft dia	21.75e	24.0R	26.0	27.0	25.0	23.0e	27.0	21.0	28.0
Femur midshaft circumference	80	79R	78	85R	92	89e	93	74	92
Tibia max dia at nutrient foramen	32.82R	33.0	33.0	42.0R	42.0	35.0	45.0	32.0	38.0
Tibia min dia at nutrient foramen	20.88R	21.0	18.0	21.0Re	23.0	22.0	29.0	19.0	22.0
Tibia circumference at nutrient foramen	86R	-	-	-	-	-	-	-	-

Notes
Henderson measurements are from Rocek and Speth 1986: Tables A4 and A5.
Tibia measurements are medial-lateral (M-L) and anterior-posterior (A-P) at nutrient foramen.
Left measurements are used when present; R = right measurement.
e = estimate based on damaged or missing bone.

hood, and at least one chronic infection, resulting in a periosteal reaction on the lower legs. Nothing in the skeletal remains indicates a cause of death.

The LA 68182 burial could well have been part of the same general population that inhabited the Henderson site. Cranial and postcranial measurements almost all fall within the range reported for these individuals. These, as well as the few observable morphological traits (smooth nuchal crests and slightly prominent mental eminences), are similar in the LA 68182 burial and two young females from Henderson. Caries rates are within the range observed for Henderson young adults, and indices reflecting mobility are not vastly different.

Table 42. Comparative indices for the femur and tibia (anteroposterior ÷ mediolateral diameter).

	Female index			Male index		
Element/Population	n	range	mean	n	range	mean
Femur						
Los Molinos (LA 68182)	1	-	1.28	-	-	-
Henderson	4	0.92-1.24	1.13	4	1.14-1.39	1.27
Galisteo	11	1.02-1.35	1.14	7	0.95-1.43	1.16
La Plata	8	0.86-1.18	1.03	12	0.80-1.14	1.01
Tibia						
Los Molinos (LA 68182)	1	-	1.57	-	-	-
Henderson	4	1.57-1.83	1.77	4	1.55-1.83	1.68
Galisteo	15	1.35-2.58	1.99	9	1.46-1.95	1.70
La Plata	9	1.50-1.90	1.64	12	1.34-1.99	1.67

Galisteo and La Plata indices from Akins 1996.

CHAPTER 15

Addressing the Data Recovery Questions

Dating the Sites

Three of the four sites investigated on this project lacked charcoal, burned clay, or any other material datable by absolute methods. The fourth site, LA 68182, produced organically rich fill, but organic samples were not assayed radiometrically because we believe that relative dates from this particular pottery assemblage will be equal to or better than the radiocarbon dates. Projectile point styles are also used for dating.

Los Molinos (LA 68182)

LA 68182 produced several pottery types and projectile points that are useful for inferring occupation dates. Dating information for bedrock mortars and basin metates in southeastern New Mexico is scant. However, LA 68182 does provide some indication of the dates of the two types of grinding features relative to one another.

Projectile point dating. Dating by projectile point styles is not well developed in New Mexico. This is particularly true for pottery period or late prehistoric sites. (Note: "late prehistoric" in Texas archaeological parlance is taxonomically equivalent to "formative" of Southwestern archaeological parlance.) Accordingly, we use a combination of the "Quick Guide" outlined for Texas by Turner and Hester (1993:Fig. 3-7), the Brantley sequence developed by Katz and Katz (1985a), the Middle Pecos sequence developed by Jelinek (1967), and the Sierra Blanca sequence developed by Kelley (1984). The geographic applicability of these sequences for all of southeastern New Mexico remains to be fully explored.

The range of projectile point styles at LA 68182 and the cultural periods they represent—Paleoindian, Archaic, late prehistoric (pottery period, ca. A.D. 700-1400+)—is truly remarkable, as follows:

Clovis	Paleoindian, early
Meserve/Dalton	Paleoindian, late
Jay	Archaic, Early
Ellis	Archaic, Middle to Late
large corner-notched dart	Archaic, Late
Hueco, **Ellis**, and **Carlsbad**	Archaic, Late to terminal
early corner-notched arrow (transitional dart to arrow)	late prehistoric, early
corner-notched arrow points	late prehistoric, early
Harrell and **Washita**	late prehistoric, middle

See appendices for specific identifications of individual projectile points.

A number of points have not been assigned to one of the named types, but they have been assigned to specific periods based on their neck widths (or minimum stem diameters), as discussed in the LA 68182 projectile point section (Chapter 6).

Of all these types and periods, only the terminal Archaic and pottery period (late prehistoric) points occur in large numbers, suggesting that the LA 68182 deposits date primarily to those periods. The other points, we presume, were brought into the site from elsewhere by the prehistoric people.

The estimated dates of occupation, based on these projectile points, are:

Beginning date:
ranges from 300 B.C. ("Transitional Archaic" of Texas [Turner and Hester 1993:Fig. 3-7]) to A.D. 1 (Brantley phase or "terminal Archaic" of the Carlsbad region; Katz and Katz 1985a:Fig. 5.1).

Ending date:
about A.D. 1450, the end date of the Oriental phase (Katz and Katz 1985a).

Range:
300 B.C./A.D. 1 to A.D. 1400+.

Pottery dating. LA 68182 produced six dated pottery types: Mimbres Black-on-white, Chupadero Black-on-white, El Paso Polychrome, Three Rivers Red-on-terracotta, Agua Fria Glaze-on-red, and Jornada Brown. Sherds in a seventh pottery category—plain/indented corrugated—are stylistically similar to Corona Corrugated. We believe, therefore, that the dates for Corona can be used as a general guide for dating these sherds as well.

The discussion that follows is based primarily on the painted pottery types. We rely more on the painted types because the dating of Jornada Brown is less well established and has some special problems, as discussed in the dating section for The Camp (LA 68183; see below). Jornada Brown was the primary utility pottery of the Glencoe phase in the Sierra Blanca. It could date as early as A.D. 200, and it lasted well into the A.D. 1300s. Thus, it predates, as well as overlaps, the painted types and could well indicate a middle to late first millennium date for LA 68182. If true, then an occupational hiatus between the Late/transitional Archaic and the late prehistoric is not indicated by the artifacts.

The latest starting date for the pottery period at LA 68182 can be estimated from Mimbres Style 2 (or transitional) Black-on-white, though beginning dates for the type are not well established. Anyon et al. (1981) suggest ca. A.D. 800, but Shafer and Taylor (1986) prefer ca. A.D. 950. Most authorities believe that the end date for Style 2 is about A.D. 1000 or shortly after.

The presence of Mimbres Black-on-white Style 2 in the Sierra Blanca region west of Roswell (but outside the area of manufacture of the type) is documented by a bowl recovered from the floor of a Jornada-Mogollon structure near Mescalero. The structure is well dated by both tree-rings and radiocarbon to the period A.D. 875-925 (Wiseman 2001b; Del Bene et al. 1986). Thus, we believe that the earliest painted pottery date for LA 68182 is probably A.D. 900 or 1000.

The most numerous pottery sherds at LA 68182 date somewhat later than Mimbres Style 2. Chupadero Black-on-white and Three Rivers Red-on-terracotta may have started about A.D. 1100 and lasted well into the 1300s or possibly the 1400s (Wiseman 1982; Hayes et al. 1981; Breternitz 1966). Manufacture dates for Corona Corrugated, and presumably the locally made copies of it, are A.D. 1225 to 1460 (Hayes et al. 1981). Corona was especially common in Lincoln phase sites, which date to the late 1200s and 1300s. The late rim variant of El Paso Polychrome is generally dated to the period A.D. 1250-1400 (Whalen 1981). Where associated with absolute dates, all of these types seem to be most common in the regional sites that date to the late 1200s and early to mid 1300s.

The pottery with the latest inception date at LA 68182 is Agua Fria Glaze-on-red, the most common Rio Grande Glaze A. Lack of agreement on the starting date for this type abounds in the literature. Snow (1997) suggests A.D. 1275, Warren (1979) suggests 1315, and C. Schaafsma (pers. comm. 1985) assured the author that A.D. 1340 was probably the most accurate. An end date for the type is also unsettled, with dates of 1450 (Breternitz 1966) and 1525 (Snow 1997) having been defended.

We are left to conclude that the probable pottery period occupation of LA 68182 is bracketed by the dates of A.D. 900 or 1000 (or later) to about 1325 or 1350. The majority of the pottery recovered from the site dates to the A.D. 1200s and 1300s. A post-1350 date does not seem likely, depending upon how one views the following discussion regarding the significance of the absence of Lincoln Black-on-red at LA 68182.

The absence of Lincoln Black-on-red at LA 68182 is very curious. It is curious precisely because Agua Fria Glaze-on-red *is* present at LA 68182. The only tree-ring dates for Lincoln are in the middle 1300s (Breternitz 1966), which led Smiley et al. (1953) to suggest that beginning and ending dates for the type are probably about A.D. 1300 to 1400. So far, so good.

Though Lincoln Black-on-red was made in the Sierra Blanca region west of Roswell, it is a common type at the Henderson site and Bloom Mound, and is present at the Fox Place and Rocky Arroyo, all in the Roswell area. Evidently the type was readily available.

Until LA 68182, the author found that where Lincoln is, Agua Fria Glaze-on-red usually is. When dealing with a large, late pottery assemblage like that from LA 68182, the correlation is almost axiomatic. In southeastern New Mexico, when one type occurs without the other, it is almost invariably the Lincoln that is present.

The closest known manufacture area for Agua Fria is central New Mexico. Thus, Agua Fria had to be carried at least twice as far as Lincoln to get it to LA 68182. This supports the notion that the supply of a given type at a specific site is generally related to the distance to the source.

Given all of this, why does LA 68182 have Agua Fria but no Lincoln? One clue may be the fact that the Agua Fria vessel represented at LA 68182 is a small bowl with unusually thin walls. This smaller, more easily transported vessel is reminiscent of so many of the Southwestern glaze vessels that were carried to the High Plains of eastern New Mexico/west Texas and beyond.

The LA 68182 vessel was a surface find. Is it possible that this bowl was not part of the LA 68182 occupation? Was the bowl lost by a passing Plainsman who had obtained his curio farther west, only to drop it while crossing, or perhaps camping overnight, on LA 68182? (Remember the one and only hearth that does not seem to fit with the rest of LA 68182?)

We will never know, but this scenario certainly seems more likely as an explanation for the absence of Lincoln at the site. It also has implications for the ceramic dating of the occupation of LA 68182. The possibility that the Agua Fria bowl was a later pot drop, plus the absence of Lincoln Black-on-red, indicates that the main occupation of LA 68182 was over by A.D. 1300.

Bedrock grinding features. The dating of bedrock mortars in southeastern New Mexico has really not been established. In fact, discussions of these features are not particularly common in the literature anywhere in the Southwest or Texas. To this author's knowledge, the existence of bedrock basin metates has been one of the better kept secrets in the region.

It has been suggested, or implied, that mortars in southeastern New Mexico are late prehistoric (Katz and Katz 1985a). This association appears to be based mainly on the proximity of mortars to late prehistoric sites like SM-108 in the Brantley area near Carlsbad. In some cases, these mortars are some distance from the late prehistoric sites, which makes the implied associations suspect.

We are in no better position at LA 68182. We assume that at least some, perhaps much, or even all uses of bedrock mortars and basin metates coincided with the accumulation of the late prehistoric pottery and artifacts in the crevice. Certainly, the predominance of the late prehistoric projectile points (arrows) and pottery suggests that this was the longest, most intense use of the site. And it seems likely that the large number of bedrock grinding features is concordant with that length and intensity of late prehistoric occupation. However, at some point in time, we need to find independent ways for dating bedrock features before we can be entirely satisfied about the matter.

In the meantime, the LA 68182 bedrock grinding features do provide hints that the bedrock mortars may date later than the bedrock basin metates. That hint lies in the 12 combination metates/mortars. In effect, the small mortar depressions within the basin metate grinding bowls establish the fact that at least those "starter" mortars date later than the metates.

Do the well-developed mortars date later than the basin metates? Because superpositioning for these examples is not clear, we cannot say with certainty at this time. It is entirely possible that both kinds of grinding facilities were used concurrently, depending upon what materials were being processed.

Dating summary for LA 68182. The dates suggested by the projectile points and pottery are in general agreement, although the projectile points suggest occupation during the end of the Archaic and prior to the production of pottery. Suggested outside bracket dates are 300 B.C. or A.D. 1 to approximately A.D. 1400.

Some of the Jornada Brown pottery could indicate occupation during the middle of the first millennium A.D. However, because the majority of projectiles are corner-notched and side-notched arrow points, the primary occupation evidently took place after A.D. 700. Given the primary dating of the majority of the painted pottery sherds, the period of primary occupation probably occurred between A.D. 1100 or even 1200 and 1300. Use of the site after 1300 is more problematical because of the absence of Lincoln Black-on-red and the presence of sherds from a single, small Agua Fria Glaze-on-red bowl. That bowl could be a pot drop not associated with the main occupation of LA 68182.

Suffice it to say, we believe the primary occupation of LA 68182 probably took place between A.D. 1200 and 1300. However, occupations of unknown duration but probably of less intensity (less cultural debris left behind) clearly occurred perhaps as early as 300 B.C. or A.D. 1 and as late as A.D. 1525.

It should be noted at this juncture that small numbers of other late-dating pottery types—Rio Grande Glaze B, Rio Grande Glaze F, and Tewa Polychrome—and projectile points (*garzas* and metal points) have been found in the greater Roswell region (notes in possession of the author). Between these and the journals of various Spanish expeditions through southeastern New Mexico, it is clear that the region was never entirely abandoned between the end of the prehistoric farming period about A.D. 1400 and the Spanish *entradas* of the mid 1500s. Instead, the Native American occupation involved one or more hunter-gatherer groups, some of which were documented to varying degrees by the Spanish.

Finally, although the bedrock grinding features cannot be directly dated, we assume that they in part, and perhaps mostly, belong to the late prehistoric pottery period. Earlier use of one or both of these feature types is certainly possible. We do have some evidence for the development and use of at least some of the mortars after the abandonment of some of the bedrock basin metates. This is demonstrated by the combination features in which mortars were started in basin metate bowls.

The Camp (LA 68183)

One Jornada Brown sherd noted during the survey phase of this project and a fragmentary projectile point are the only temporally diagnostic artifacts known for this site. However, the sherd could not be relocated at the time of the data recovery phase. All of the identified hearths apparently were burned rock features.

Projectile point dating. A fragment of a corner-notched arrow point was recovered from the surface of the site. As mentioned earlier for LA 68182, this style of arrow point may have been introduced into the region as early as A.D. 700 and perhaps no later than A.D. 1200.

Pottery dating. Jornada Brown was the premier utility pottery made and used throughout the late prehistoric period in the Sierra Blanca country west of Roswell. The type is well represented at nearby LA 68182, as well as at several other sites in the area. However, its dates of manufacture are imperfectly established.

The beginning date for Jornada Brown is clearly in the first millennium A.D. Until recently, this author considered a date of the first two to four centuries A.D. as very likely (Miller 1996). This guess was based on the increasingly early dating of El Paso Brown of the El Paso district 300 km southwest of Roswell. El Paso Brown is related to Jornada Brown in as yet unspecified ways, but pottery analysts often have difficulties in distinguishing the two. El Paso and Jornada share contiguous territories and similar culture histories.

It was not surprising, therefore, to find that several sherds of Jornada Brown were recovered from stratified deposits dated in the A.D. 200s and later at Deadman's Shelter in the Texas Panhandle (Hughes and Willey 1978). This author had the opportunity to examine the pottery from Deadman's Shelter, and concurs that some of it is definitely Jornada Brown.

The association between the pottery and the A.D. 200s date appears to be valid. A lower context (stratum E/D) produced three radiocarbon dates: one in the A.D. 100s, one in the A.D. 200s, and a third in the A.D. 1300s. This last date is obviously in error. A higher stratum (B) produced radiocarbon dates in the A.D. 400s and 700s. Thus, with the exception of the 1300s date, the stratigraphy and dates are consistent with one another. Together, they support an A.D. 200s date for Stratum D and an early date for Jornada Brown.

Rodent burrowing and contamination of Stratum D is documented by the A.D. 1300s date obtained from that stratum. However, we find it difficult to believe that so many sherds could have been introduced by rodents and yet remain undetected by the archaeologists.

All in all, there was no problem until the excavation of the Sunset Archaic site (LA 58971) in the eastern Sierra Blanca foothills 50 km west of Roswell. This base camp had very large storage pits, hearths, and reliable evidence of the use of corn, all well dated to the first four centuries A.D.

The problem is that no pottery whatsoever was recovered from the site. Although only every other shovel of fill was screened, thousands of pieces of lithic debitage were recovered. Surely, if pottery had been present, at least one sherd would have been found in the 150 square meters of excavated site area or along the vast highway cuts on both sides of the road. In addition, the Sunset Archaic site is situated on one of the presumed major prehistoric "highways" (Rio Hondo) between the Sierra Blanca, the Pecos Valley (Roswell), and beyond.

Thus, we have a quandary. Did the inception of Jornada Brown occur as early as the A.D. 200s, as suggested at Deadman's Shelter? Or are those dates too early, as suggested by the absence of pottery at the Sunset Archaic site? If the latter is correct, then Jornada Brown was probably made after A.D. 400 or perhaps 500. Clearly, this point must be addressed in future research.

The end date for Jornada Brown is a little easier to pinpoint, at least insofar as "pinpointing" is possible. The type was the primary utility pottery throughout the Glencoe phase (Kelley 1984) farming occupation of the east slope of the Sierra Blanca. Kelley suggests that the Glencoe ended by about the middle of the fourteenth century. Thus, we believe that Jornada Brown dates from possibly as early as A.D. 200 to at least 1350.

Hearth style dating. The one intact hearth lacked charcoal and staining by which it could be radiocarbon dated. However, the form of the hearth, a 1-m-diameter collection of burned rocks resting in (mostly) a plane of single rocks, is like other hearths dated in the region to the Late/terminal Archaic (see discussion for LA 54347, the White Paint site). On this basis, Feature 1 at LA 68183 probably dates to the period 1000 B.C. to A.D. 750. However, the seemingly errant dates for an LA 8053-style hearth present the possibility that this type of hearth was used as late as A.D. 1200.

Dating summary for LA 68183. The one corner-notched arrow point from LA 68183 indicates a date somewhere within the period A.D. 700 to 1200. The one Jornada Brown sherd was probably made some time between about A.D. 200 to about A.D. 1350. The overlap between the two is therefore A.D. 700 to 1200.

These dates are potentially at variance with the one intact hearth, the form of which has been dated farther south in New Mexico to the Late/terminal Archaic (1000 B.C. to A.D. 750). However, slim evidence at LA 8053 suggests that this hearth form may date as late as A.D. 1200 in southeastern New Mexico.

If the late dating for large burned-rock hearths is correct, then the projectile point, pottery sherd, and hearth at LA 68183 are in agreement for an occupation date within the late prehistoric period of A.D. 700 to 1200. If not, then at least two occupations are indicated, one in the Late to terminal Archaic (1000 B.C. to 750 A.D.) and the other in the late prehistoric (A.D. 700 to 1200). We suspect that the true date of the occupation(s) lies within the period A.D. 700 to 1200.

White Paint (LA 54347)

Few items having temporal value were recovered from this very large site. The discussion that follows indicates that part of the occupation span is currently knowable. The one excavated hearth, Feature 1, also has dating potential and is discussed below.

Projectile point dating. The four projectile points recovered from LA 54347 embody a variety of interesting, mostly noncharacteristic shapes or styles. Therefore, we rely on the neck-width categories established by Katz and Katz (1985a) for the Brantley area south of Roswell to assign them to time periods. The categories are described in more detail in the projectile point description section for LA 68182.

The earliest point, FS 648, appears to be a Carlsbad point fragment. Its neck width of 14.5 mm falls within the Late Archaic period which, in the Carlsbad region, means the McMillan phase (1000 B.C. to A.D. 1). Carlsbad points are a feature of the McMillan phase assemblage in that region, strengthening our suggested dating for the LA 54347 specimen.

FS 648 was recovered from fill within two meters of the Feature 1 hearth, suggesting a temporal association between the two (see hearth-dating discussion below). As a cautionary note, subsequent work in the region suggests that artifacts found within two meters of hearths may not belong to the same occupation as those hearths.

The next oldest point, again based on neck width, is FS 0-6, a short, wide (squat), side-notched specimen. The neck-width of 11 mm suggests a date in the terminal Archaic period, the Brantley phase at Carlsbad, which dates A.D. 1 to 750.

Point FS 61 is small, squat, basally notched, and has a neck width of 10.5 mm. Like the preceding point, a terminal Archaic date is indicated.

The last point is FS 0-3, a long, corner-notched point with a neck width of 9 mm. Katz and Katz (1985a) assign specimens with this neck width to the early arrow points, presumably meaning the early late prehistoric period Globe phase, A.D. 750 to 1150.

Pottery dating. No pottery was recovered from the LA 54347 site.

Hearth dating. The Feature 1 hearth at LA 54347 lacked charcoal by which to obtain a radiocarbon date. However, its size, composition, and relationship to the aboriginal ground surface are potentially useful for dating.

Feature 1 is large (approximately 1 m diameter) and is composed of numerous burned rocks lying in a more-or-less single layer on the aboriginal ground surface. This style of hearth has been dated by radiocarbon to the Late and terminal Archaic periods (Wiseman 2001c). More specifically, with one possible exception, these hearths date to before A.D. 800, and many date to before the time of Christ. The exception, to be discussed for LA 8053 in the forthcoming Seven Rivers Project report, may represent either contamination or mislabeling. A radiocarbon date from this feature yielded intercept dates in the A.D. 1000s and 1100s.

Dating summary for LA 54347. Scant as the evidence is for this large site, the projectile points and hearth style are in general agreement. Occupation of the LA 54347 site, at a minimum, appears to span all or parts of the Late Archaic, terminal Archaic, and perhaps the early late prehistoric periods. The absence of pottery weakens the argument for an early late prehistoric occupation. The overall span of these three periods is 1000 B.C. to A.D. 1150. We assume that this evidence indicates multiple, short-term occupations over perhaps 2,100 years, rather than one long, continuous occupation.

Sitio Largo (LA 68185)

The work at this very large site was limited to surface collections made by the Office of Archaeological Studies, and at a somewhat later date, by Lone Mountain Archaeological Services, Inc. of Albuquerque (Flynn and Travis-Suhay 1996). The datable artifacts include chipped stone projectile points and a metal projectile point. No pottery was recovered from LA 68185.

Projectile point dating. Six projectile points are sufficiently complete to permit type identifications and estimation of occupation dates. We also rely on the neck-width categories established by Katz and Katz (1985a) for the Brantley area south of Roswell to assign them to time periods. The Katzes' categories are described in more detail in the projectile point description section for LA 68182.

The earliest point is a Marshall dart point (FS 0-14) with a neck width of 18.5 mm. In Texas, Marshalls date to the Middle Archaic (1000 B.C. or earlier; Turner and Hester 1993). This agrees well with the Katzes' sequence and dating, in that the neck width of our specimen exceeds the greatest width (16 mm) for Late Archaic points. Although the Katzes did not recover Middle Archaic materials at Brantley, they do provide a phase name and dates for the period—Avalon, 3000-1000 B.C.

FS 0-13 is another possible Middle Archaic point. This specimen has a shape suggestive of the Pedernales type of central Texas. Two aspects of the item mitigate against it being a Pedernales point. The neck width is only 11 mm, which is very narrow for a Middle Archaic point according to the neck-width criteria, and neither face of the stem is fluted or thinned by means of removing one or more large flakes from the basal edge and in the direction of the blade. Turner and Hester (1993) state that the type has variable dimensions. This type assignment, and the dates the type imply, must remain very problematic.

The next presumably oldest point (FS 0-3) from LA 68185 is a long, side-notched dart point that can be arguably typed as a San Pedro (large) in the Archaic Chihuahua Tradition (south-central New Mexico) and a Godley in the Texas sequence. San Pedros (900 B.C. to A.D. 200; MacNeish and Beckett 1987) and Godleys (1000 to 300 B.C.; Turner and Hester 1993, "Quick Guide") both date as early as the Late Archaic period, but some are found in late prehistoric contexts as well. The neck width of our specimen is 14.5 mm, which places it in the terminal Archaic Brantley phase (A.D. 1 to 750) of the Brantley sequence.

The fourth projectile point (FS 0-9) is a short, squat, corner-notched, concave-based dart. It is provisionally typed as a Chiricahua point of the Middle Archaic Fresnal phase (2500 to 900 B.C.; MacNeish and Beckett 1987) of the Archaic Chihuahua sequence and an Edgewood point of the Transitional Archaic (300 B.C. to A.D. 700; Turner and Hester 1993 "Quick Guide") in the Texas sequence. The neck width of 12.5 mm places it in the terminal Archaic Brantley phase (A.D. 1 to 750; Katz and Katz 1985a) of the Brantley sequence. In view of the lack of agreement between the Archaic Chihuahua and Texas estimates, we follow the Brantley estimation here.

The fifth point (FS 0-1) is also a short, squat, corner/side-notched dart tip. It defies typing, but its 10-mm neck width places it in the terminal Archaic Brantley phase (A.D. 1 to 750; Katz and Katz 1985a) of the Brantley sequence.

The last and most recent projectile point is the metal arrow tip found by the Lone Mountain survey crew (Flynn and Travis-Suhay 1996). Made from a metal barrel band or similar sheet metal, these items are typical nineteenth century weapon points used by virtually all Plains warriors who did not possess firearms. The people responsible for the LA 68185 specimen could have been Comanches, Kiowas, Cheyennes, Apaches, or any of several other groups known to have visited New Mexico.

End-scraper dating. The two end-scrapers recovered at LA 68185 are of a distinctive form that appeared with the advent of the late prehistoric II period bison-hunting complex on the Southern Plains. This complex evidently derived from the Central and Northern Plains. It first appeared on the Southern Plains about A.D. 1100 or 1200 and continued into the early historic period (Boyd 1997).

Whether the LA 68185 specimens represent occupations equivalent to Boyd's late prehistoric II period (A.D. 1100/1200 to 1541) or the protohistoric period (A.D. 1541 to 1750) is uncertain at this time. We suspect that the end-scrapers are prehistoric, but it is also possible that they belong to the same occupation as the metal projectile point.

Pottery dating. No pottery was found at LA 68185.

Dating summary for LA 68185. The projectile points indicate a long use span for LA 68185. This is to be expected of sites situated near good water sources. Although we must always bear in mind the fact that southeastern New Mexico witnessed a lot of reuse of earlier items by later peoples, we still have to consider the broadest (i.e., most conservative) dating estimates for small samples.

Thus, LA 68185 may have been used intermittently over a period of a few thousand years, starting possibly as early as 3000 B.C. and lasting possibly as late as the nineteenth century. The absence of pottery is curious and suggests that little or no occupation took place during the late prehistoric period when pottery was widely available in the Roswell area. However, distinctive Plains end-scrapers are present at LA 68185, and they argue for occupation at some point during either the late prehistoric period or the protohistoric/early historic period (between A.D. 1100/1200 and 1750 on the Southern Plains of Texas).

Function of the Sites

Los Molinos (LA 68182)

The immediately obvious function of LA 68182 was as a place to grind foodstuffs. The 47 individual bedrock basin metates, 17 mortars, and 12 combination metate/mortars clearly implicate this site as a major landscape feature for the prehistoric peoples.

One of the more curious aspects of the artifact assemblage is the presence of fragmentary basin metates and a single portable mortar. Why were these items brought to the site when bedrock counterparts were present and heavily used? The fact that the portable metates and mortar are fragmentary indicates that they were used and broken at LA 68182. These lightweight, portable metates are sometimes referred to as "travel" metates and are generally believed by the author to have belonged to hunter-gatherers, not farmers.

The four grinding media—bedrock metates, portable metates, bedrock mortars, portable mortars—are not necessarily contradictory. As implied under the third data recovery question (Subsistence Remains; see below), the inhabitants of LA 68182 were not necessarily farmers, even though corn cultivation and the focus on wild annual plant species suggest they were.

The quantities of corn being processed at LA 68182, as reflected in grinding-surface size of the metates, may ultimately be the key. The small grinding surfaces indicate that relatively small amounts of corn (or any other foodstuff) were being processed at any one time. This is generally believed to be more characteristic of hunter-gatherers than of farmers. The grinding surfaces of the metates at villages like Henderson are much larger, probably having at least twice the grinding capacity of the LA 68182 metates (both bedrock and travel forms). This subject is discussed under the third data recovery question (Subsistence Remains; see below)

The trash-filled crevice is truly enigmatic, and serendipitous for the archaeologists. Are we correct in assuming that this crevice was mostly filled with natural debris at the time that the Native Americans first started using the site? Surely it was not empty and gaping for all to find. So, if it was partly or totally filled at the time of first discovery, what would induce the inhabitants to clean it out?

One possibility is that the crevice was so narrow that it could have been roofed and used for shelter from the wind and sun. Depending upon whether the roof was flat or domed, the space underneath would have been as low as 1 meter or as high as 1.5 to 2 meters. A similar crevice was found at the Phantom Lake Spring site in West Texas (Charles 1994). There, a prehistoric, trash-filled depression next to a rock outcrop was found to contain two stacked-rock walls that appeared to form enclosed spaces (i.e., "rooms"). But no such constructions were found in the crevice at LA 68182.

The creation of a series of storage pits is another possible explanation for how and why the crevice at LA 68182 was initially emptied of its natural fill. Either way, intensive rodent disturbance could have easily distorted or destroyed the sides and bottoms of such pits, thereby precluding archaeological recognition of their existence.

The crevice was subsequently used as a place to dispose of trash. This activity evidently lasted for a period of about 300 years. During that time, the inhabitants disposed of a minimum of 47,000+ pieces of lithic debitage, pottery sherds, animal remains, and formal artifacts. They also buried one of their deceased members in the resulting accumulation.

It is evident from the number (another 6,500+ items) and distribution of surface artifacts that refuse dumping on the location continued after the crevice was filled. During the last dumping episodes, refuse was piled over the crevice and along its margins for several meters to either side.

One of the ways that archaeologists look at the question of site use is to examine the types and diversity of activities that took place. In the absence of features other than the bedrock grinding loci, a single rock hearth, and the trash-filled crevice, we are left with the types and diversity of formal artifacts and manufacture debris.

The formal artifacts from LA 68182 include the following: the metates, manos, mortars, and pestle already mentioned, as well as dart and arrow projectile points, drills, hammerstones, an awl, flake tools, several types of scrapers, numerous pottery vessels, a spokeshave, a worked sherd, and unifaces. Clearly, this diverse array of artifact types documents a variety of activities normally associated with base camp/habitation occupations.

Manufacture debris is represented by items of shell, ground stone, and chipped stone. The chipped stone debris includes several stages of reduction bifaces and preforms, in addition to cores, flakes, and shatter. The nearly 33,000 items in this category bespeak a major chipped stone industry at this location.

The UV light study groups LA 68182 with other sites in the immediate area. That is, there was almost no response to ultraviolet light. This, plus the unusually poor knapping characteristics of the chert, indicate that these materials were probably local in origin.

Plains-like items include two (and possibly four) wing-tipped drills, two end-scrapers, and the tip of a possible beveled knife. However, none of these items are made of unambiguous Plains materials such as Alibates, Tecovas, or Edwards cherts, though one end-scraper is made of an Alibates lookalike chert.

The end-scrapers are not especially good examples of the Plains type, though Plains end-scrapers do include a fair amount of variability (O'Brien 1984; Turner and Hester 1993). Much better examples of these scrapers were recovered from LA 68185 (this report) and Bob Crosby Draw (Wiseman 2000a).

Although we lack clear examples of Plains tools, LA 68182 produced a respectable quantity of Plains materials and possible Plains materials. Obsidian, presumably from the Southwest, is also present. The materials are summarized in Table 43.

The projectile points made of imported and probably imported materials represent 13% and 18% of the projectile points. These points include two transitional Archaic dart points, four corner-notched arrow points, and three side-notched arrow points. The other artifacts (bifaces, etc.) represent 4% to 8% of their respective categories. The four pieces of debitage represent less than 1% of that category.

Thus, imported and probably imported lithic materials are best represented in finished artifacts, especially projectile points, indicating that these items were brought into the site from elsewhere. Given the presence

Table 43. LA 68182: summary of imported lithic materials.

	Tecovas Chert	Tecovas Chert Lookalike	Alibates Material	Possible Alibates Material	Alibates Material Lookalike	Possible Edwards Chert	Hazy Gray Obsidian	Clear Black Obsidian	Total
Transitional Archaic dart point	-	2	-	-	-	-	-	-	2
Corner-notched arrow point	1	-	1	-	1	-	1	-	4
Side-notched arrow point	1	-	-	-	1	1	-	-	3
Projectile point preform	-	1	1	-	-	-	-	-	2
Miscellaneous biface	-	-	2	-	1	-	1	-	4
End-scraper	-	-	-	-	1	-	-	-	1
Debitage	-	-	-	1	-	-	-	3	4
Total	2	3	4	1	4	1	2	3	20

of smaller amounts of these materials among the flakes and biface fragments, some of these items may have been made at the site. Given the distances to the known and suspected sources of these materials, the rather small numbers are more impressive than would otherwise be the case.

The Camp (LA 68183)

The primary features of LA 68183 are the four hearths and the associated artifact scatter. A short-term camping function is implied by the small amount of, and very limited diversity in, the artifactual debris (1 projectile point fragment, 2 flake tools, 7 cores, 39 unmodified flakes, 6 pieces of shatter, and 1 potsherd).

Although a greater amount of excavation may not have significantly changed this basic assessment, subsequent work has raised at least one question that cannot be, but perhaps could have been, answered by this site. That question revolves around the relationship of the projectile point and potsherd to the hearths.

The much more substantive excavations undertaken for the Roswell South and Seven Rivers projects (Wiseman 2001c) have yielded important implications about the dating of certain kinds of thermal features. Specifically, hearths with moderate to large numbers of burned rocks generally date to the Archaic period, or before A.D. 700 or 800.

Hearths belonging to the succeeding late prehistoric (pottery and arrow point) period usually lack burned rocks. Occasionally, a pottery period hearth will have a few rocks in the fill. These hearths usually do not show on the surface but have to be found by surface stripping. Small, rockless hearths, which are generally 25 to 30 cm in diameter and vary from 5 to 15 cm in depth, have been dated from the A.D. 800s to the 1800s.

At this point, we are fairly confident about the dating of these hearth types. However, we still do not know much about their distribution and welcome all new datable examples. We suspect that one or more rockless hearths existed at LA 68183. However, failure to excavate widely precludes our knowing whether they occur this far north. Thus, we cannot confidently state whether the arrow point and the sherd belong to the excavated rock hearths or to undiscovered rockless hearths.

The UV light study groups LA 68183 with other sites in the immediate area. There was almost no response to ultraviolet light. This indicates that these materials were probably local in origin.

No Plains or Plains-like artifacts were recovered from LA 68183.

Imported lithic materials are represented by a solitary flake. This piece of probable Edwards chert constitutes 1% of the debitage assemblage recovered from the site.

White Paint (LA 54347)

Aside from the intensive surface artifact collection and burned rock inventory conducted at this large site, very little other work was undertaken. A key aspect of this decision was the mistaken notion that the site lay essentially at the surface and therefore probably had little to offer through excavation. Consequently, the one obvious hearth was excavated, and several possible hearths were trowel tested.

The low number of surface artifacts suggested that broad-scale surface stripping would not be productive. Since that time, the author has used surface stripping as a routine procedure. *In every case, extremely favorable results have been obtained*. The failure to do this at LA 54347 was a major mistake. This is amply reflected in the fact that we can say very little about this site and its occupants.

The formal and informal tools from LA 54347 include 1 mano, 2 metate fragments, 5 Late Archaic to terminal Archaic dart points, a possible drill, 17 flake tools, a graver, 6 scrapers, 1 fragment of a small biface, 10 fragments of large bifaces, and a uniface. Tool manufacture debris includes 13 roughout bifaces, 112 cores, 912 flakes, and 94 pieces of shatter and cherty material. While this is not a particularly large number of items for a site the size of LA 54347, it is sufficiently diverse to permit us to suggest that LA 54347 was probably a base camp location.

Before proceeding, it is worth emphasizing two facts that hinder our ability to interpret this site. First, the site has experienced serious, long-term artifact collecting by local people. Being on the outskirts of Roswell, it was readily accessible to the numerous collectors who operated out of Roswell during the 1950s and 1960s. Second, and worse yet, our failure to carry out broad-scale stripping guaranteed that the numerous artifacts remaining just subsurface (note the number of items recovered around the excavated hearth) would not be recovered or made available for study (for instance, see Wiseman 1998). Again, hindsight and subsequent experience provide ample evidence that the old approach to dealing with these sites is no longer acceptable.

One additional note also concerns some of our more recent findings regarding possible relationships between artifacts and their proximity to thermal features. We have evidence that diagnostic artifacts (projectile points, pottery, etc.) found within a 2- to 3-meter radius of a given hearth may not belong to the occupation represented by that hearth. Note that we are not speaking of diagnostic artifacts recovered directly from the hearth itself.

On later projects (Seven Rivers and Roswell South) we have excavated around several thermal features that were evidently isolated, single-occupation camps. In these situations, the 2- to 3-meter-wide zone around the hearths was virtually free of artifacts. Beyond that zone, a continuous scatter of artifacts was noted. These results at least generally meet the expectations of the Concentric Ring Model proposed by Henderson (1976), even though the actual test of the model did not give satisfactory results in all respects (Gallagher and Bearden 1980).

We suspect on the basis of other studies (O'Laughlin 1979, for instance) that the large size of the LA 54347 site is probably the result of accretionary growth and not the result of one large group settled for a single occupation. Sites that witnessed accretionary growth are generally at favored locations that were settled multiple times by small groups of people over a period of years, decades, or even centuries.

Each time a small group wished to camp at the location, they would set up camp next to, but not directly on, the previous camps. Presumably this was done to avoid having to deal with the litter of the previous occupants. Thus, sites like LA 54347 grow in cell-like fashion until they become quite large. This type of growth, of course, can take place only where space is unlimited.

The UV light study of presumed local gray cherts places LA 54347 with the other sites in the immediate area. There was almost no response to ultraviolet light. This indicates that these materials were probably local in origin.

The only Plains or Plains-like artifact from LA 54347 is a fragment of a wing-tipped drill made of a local/regional material.

Imported lithic materials are represented by one roughout and 7 flakes. The roughout is made of possible Tecovas chert and represents 8% of the roughout bifaces. The materials of the 7 flakes include 1 Alibates, 1 possible Alibates, 3 Alibates/Tecovas lookalikes, 1 Edwards, and 1 possible Edwards. Together, they constitute less than 1% of the debitage assemblage from this site.

Sitio Largo (LA 68185)

The information available for this site was acquired during the testing phase. A hearth was supposed to be excavated during the data recovery phase, but it was hidden under a layer of flood silts prior to the data recovery project. Thus, our only information consists of the notes and collections made before the flood, plus notes and artifacts collected by Lone Mountain Archaeological Services from a nonflooded part of the site.

The OAS testing phase documented several eroded hearths and made a sample collection of artifacts (Wiseman 1989). Most of the site, including a number of probably intact features, lies outside the highway project. The main reason for including LA 68185 here is to make it a part of the public record.

Like the LA 54347 site, which is situated directly across the South Berrendo Creek from LA 68185, the predominant impression of LA 68185 is that it was a camp site. Burned rock litters the site surface, and several hearths are evident in the remaining portion of the site. This site was also heavily impacted by artifact collectors in the 1950s and 1960s.

The artifact inventory from LA 68185 includes 2 manos, 6 projectile points, 2 scrapers, a flake tool, a graver, a spokeshave, and a uniface. The projectile points are attributable to the Middle Archaic, Late Archaic, possibly the transitional Archaic, and the historic periods. Tool manufacture debris includes 1 roughout biface, 1 small biface, 4 large bifaces, 7 cores, 58 flakes, and 6 pieces of shatter and cherty material. The total assemblage primarily represents that portion of the site lying within the highway project. It is not a particularly large number of items, but it is sufficiently diverse to permit us to suggest that LA 68185 was probably a base camp location.

True to its name, Sitio Largo appears to be a long, narrow site that stretches along the south terrace edge of the South Berrendo. Like LA 54347, we assume that it represents a series of relatively short occupations by small groups placed side by side, rather than one long large occupation by a single group. This interpretation is clearly supported by the range of projectile point styles and the dates they imply.

The few gray chert flakes from LA 68185 were not subjected to the UV analysis.

Two Plains-style end-scrapers were recovered from the surface of LA 68185. The complete specimen is made of Alibates material. The fragmentary one is made of high-quality fingerprint chert that probably came from a regional source. These particular specimens are of the classic form common to late prehistoric/early historic Plains bison-hunting cultures.

Aside from the Alibates end-scraper just mentioned, no other items made of known or suspected imported materials were recovered from LA 68185.

Subsistence Remains

Animal Resources

Faunal and floral remains were recovered from only one site, LA 68182. The recovery of these remains is extremely fortunate in terms of the richness and variety of taxa represented. All of this is due to the crevice, which preserved the remains despite the site being fully exposed to the elements.

One of the less fortunate aspects of the assemblage is the fact that, in spite of the depth of the deposits and the overall length of site use, pre-excavation disturbances precluded meaningful segregation of temporally sensitive components within the assemblage. No stratigraphy could be discerned in profile. One group of occupants buried a deceased band member in the middle of the main deposits, mixing a large part of the trash in the process. Probably more damaging, rodents burrowed throughout the deposits and scattered everything in their way, including the human remains. Thus, the faunal sample has to be treated as a single body of material, rather than permitting us to examine it for dietary stability or change through time.

Nevertheless, the faunal assemblage is remarkable and provides a large amount of information, especially considering that nonstructural sites in the region tend to produce minimal bone material. Akins and Moga (Chapter 11) and Wiseman (Chapter 12) analyzed the faunal remains. Taken together, 51 taxa were defined, including 28 species.

Akins and Moga (see Table 35) find evidence that nine species were clearly used by the prehistoric inhabitants—prairie dog, cottontail, jackrabbit, deer, pronghorn, bison, muskrat, yellow mud turtle, and softshell turtle. Both Akins and Moga, and Wiseman believe that the two species of mussels, *Cyrtonaias tampicoensis* and *Popenaias popeii*, can be added to this list.

Akins and Moga (see Table 35) also state that 10 other species/taxa could have been used because they are known to have been used by prehistoric and historic peoples elsewhere. However, the LA 68182 specimens fail to meet the existing criteria of human use. These are porcupine, *Canis* sp. (dog, coyote, or wolf), ducks (the anatids), turkey, American coot, mourning dove, painted turtle, pond slider (a turtle), western river cooter (another turtle), and ornate box turtle.

Akins and Moga (see Table 35) note the abundant remains of gopher. However, they suggest that these animals, being burrowers, small in body size, and somewhat difficult to obtain, probably were *not* used for food by the LA 68182 people. Yet a large number of gopher elements (30) are present in the LA 68182 assemblage, and some of them are burned. If we do not consider burning in this case to indicate human use, then we cannot consider burning as evidence for the use of other species either. Accordingly, this author (Wiseman) believes that at least some of the gophers were captured and eaten by the LA 68182 people.

Finally, Akins and Moga (see Table 35) believe that the remaining species/taxa—including cottonrat, woodrat, kangaroo rat, grasshopper mouse, small perching birds, snapping turtle, snake, horned lizard, frog, and toad—may have been introduced into the deposits through various postoccupational agencies. This may well be true, but it is worth noting that various protohistoric and historic peoples in New Mexico, Texas, and northern Mexico are known to have used similar species for food.

For instance, a group of Zuni hunters, at an evening camp during a hunt, caught and consumed a woodrat (Cushing 1974). Tewa informants admit to eating some of the smaller bird species (though not all of them; Trierweiler 1990). The Tarahumara and Tepehuan Indians of northern Mexico ate a variety of birds and rodents such as moles, mice, rats, gophers, woodrats, ground squirrels, and larger species (Pennington 1963, 1969). They also will eat carnivores such as skunks and ocelots, but these are usually considered to be "starvation foods." On his journey through west Texas in the A.D. 1530s, Cabeza de Vaca observed people eating "spiders" (tarantulas?) and "millipedes" (Covey 1997).

The impression is given, then, that many people living under aboriginal conditions ate virtually anything that was alive. Why would they not? This was *before* the massive problems of resource depletion experienced by Native Americans as a result of Euroamerican movement into western North America. Not having modern supermarkets at hand, they probably used most species as a matter of practicality.

This gives a different, but important, perspective on animal (and plant) use at LA 68182. It is true that the larger-bodied animals provided the major part of the meat in the diet. However, it must be remembered that large kills are generally consumed quickly in hunter-gatherer societies. This is because the meat of large animals is generally considered to be a prestige item and is usually widely shared according to a variety of social rules (Kelly 1995).

This sharing not only satisfies social obligations, but it also spreads nutrition to a larger number of individuals. Perhaps just as importantly, sharing prevents potential loss of valuable food through spoilage. Thus, the period of time during which the benefits from large kills are available is generally shorter than one might suppose. Smaller-bodied animals might be seen as fillers between large kills, resulting in more balanced nutrition through the year. Their importance should not be underestimated.

Before continuing, we must mention the potential role of food preservation techniques that could have extended the availability of meat from large kills. These include drying, production of pemmican, and the like. Though we have no evidence that any of these techniques were used by the inhabitants of LA 68182, it is probably safe to assume that they were. However, we have no physical evidence at the site that long-term storage was practiced, making it likely that our previous proposition (small animals as fillers) accurately characterizes at least part of the LA 68182 subsistence system.

The relatively large number of species/taxa represented in the LA 68182 faunal assemblage is in part to be expected given the well-known statistical phenomenon that the larger the assemblage, the greater the diversity. However, the LA 68182 diversity probably also reflects the nature of the local environment and the willingness of the site occupants to use most of the available species.

One aspect of the LA 68182 fauna is perplexing—the absence of fish. As Akins and Moga point out, the absence of fish is *not* the result of archaeological recovery techniques. The same techniques (1/4-inch wire mesh screening) were used at the Fox Place, where thousands of fish bones were recovered, including minnow-sized elements.

Akins, in a discussion with this author, suggested some possibilities as to why fish are missing from LA 68182. One is that fish may have been absent in the Middle Berrendo Creek. Another is that they were present but that the LA 68182 people ignored them. And a third possibility is that fish had been present but suffered a catastrophic die-off prior to and during the prehistoric occupations at LA 68182.

As the discussion developed, we decided that the catastrophic die-off hypothesis does not suffice simply because the site was occupied over several hundred years. Even if a catastrophic die-off had occurred, there should have been ample time for natural reintroduction from other streams in the Hondo-Spring-Berrendo system during the occupation of the site. After all, contemporary sites like the Fox Place (Wiseman 2002), Rocky Arroyo (Wiseman 1985), and Henderson (Speth 2003) are within the Hondo-Spring-Berrendo system, and they produced ample fish remains.

Historic documents and twentieth century informants indicate that fish were available in the Berrendo (and all other perennial creeks in the area) until flow ceased some time in the early twentieth century. In fact, local literature regarding the period of first Euro-American habitation in the area (mid-1800s) states the situation nicely:

> "Six rivers within four miles of our door … literally alive, all of them with fish. Catfish, sunfish, bull pouts, suckers, eels, and in the Spring Rivers and the two Berrendo … splendid bass. The four rivers are so pellucid that you can discern the smallest object at their greatest depth. … Bass in the clear streams from two to four pounds is an average …" (Shinkle 1966:16)

That leaves refusal to use fish as the most likely reason for its absence at LA 68182. If true, this fact clearly sets the inhabitants of LA 68182 apart from those of the Fox Place, Rocky Arroyo, and Henderson. It should be noted that the Middle Berrendo is a tributary of the Hondo; the two streams join about 9 km southeast of LA 68182 and about the same distance northeast of the Fox Place, the closest of the three "fishing" villages.

In terms of comparison, a few other excavations in the Roswell area have produced faunal assemblages. The sites chosen for comparison all represent the late prehistoric (pottery) period and therefore are generally contemporaneous with LA 68182 (Table 44). The sites include:

- Six of Jelinek's sites (1967) along the Pecos River northeast of LA 68182; these sites evidently are structural and together represent farming communities that encompass several centuries of occupation of the valley.

Table 44. Comparison (% NISP) of faunal assemblages from selected sites in the Roswell/Sierra Blanca region.

	LM	EMP	LMP	GSC	BM	BLK	BON
Total NISP	1303	396	233	41	32	137	2085
bison	6	3	87	15	28	16	2
pronghorn	6	3	-	-	6	44	4
pronghorn/deer	-	5	<1	5	-	-	-
deer	2	-	-	-	19	13	7
jackrabbit	12	47	9	39	9	7	12
cottontail	29	27	4	22	22	18	50
prairie dog	21	1	-	-	-	-	4
gopher	1	<1	-	-	-	-	4
woodrat/hispid cotton rat	1	-	-	-	-	1	<1
rodent	-	-	-	5	16	1	16
muskrat	3	-	-	-	-	-	1
turtle	11	13	-	-	-	-	-
mussel	5	-	-	15	-	-	-
turkey	<1	-	-	-	-	-	-
waterfowl	<1	-	-	-	-	-	-
other	2	<1	-	-	-	-	-
total % NISP	100	100	100	101	100	100	100

LM Los Molinos (LA 68182), Plains, A.D. 1100/1200 to 1350/1400 (this report).
EMP early Middle Pecos, Plains, A.D. 900 to 1250 (Jelinek 1967).
LMP late Middle Pecos, Plains, A.D. 1250 to 1300 (Jelinek 1967).
GSS Garnsey Spring Campsite, Plains, A.D. 800 to 1600 (Parry and Speth 1984).
BM Bloom Mound, Plains, thirteenth-fourteenth century (Driver 1985).
BLK Block Lookout/Smokey Bear, Mountains-Plains, thirteenth-fourteenth century (Driver 1985).
BON Bonnell site, Mountains, thirteenth-fourteenth century (Driver 1985).

- The Garnsey Spring Campsite (Parry and Speth 1984), located near the Pecos River a few kilometers southeast of LA 68182, evidently is a hunter-gatherer camp used over a few centuries.

- Bloom Mound is a small pueblo and ceremonial room (Kelley 1984) situated on the Rio Hondo several kilometers southwest of LA 68182.

- The Block Lookout (Kelley 1984) or Smokey Bear (Wiseman et al. 1976) site is a major pueblo village situated north of the Capitan Mountains and on the edge of the Hasparos Embayment, a westward extension of the plains; Block Lookout is 80 km west-northwest of LA 68182.

- The Bonnell site (Kelley 1984) is a major, multicomponent pithouse village located along the Rio Ruidoso, well within the high foothills of Sierra Blanca and nearly 90 km west of LA 68182.

The assemblages from the above sites, having been excavated over the past 35 years, represent a variety of excavation and recovery strategies that are not fully comparable in detail. For instance, it is not clear in all instances whether screens were used, and if used, what the mesh size was. Thus, we suspect that a size bias has been injected into the data sets, with the smaller elements and smaller taxa being underrepresented. Another problem is sample size: Garnsey Spring Campsite and Bloom Mound have fewer than 100 identifiable elements. Nevertheless, these assemblages are what is available, and some broad generalizations are possible.

The discussion below refers only to some of the identified species and ignores others. For instance, carnivores and mice have been omitted because of uncertainty as to whether they were used as food by humans. Also, size categories such as large mammal, medium mammal, small mammal, etc. are not included in the calculations.

Table 44 reveals several interesting aspects. In the discussions that follow, the reader should bear in mind the fact that differences in recovery techniques used at the various sites have undoubtedly favored the recovery of bones from the larger mammals. Accordingly, bison, antelope and/or deer, jackrabbits, and cottontails are the best represented species.

The local environment at each site is another factor that is probably in part responsible for faunal assemblage compositions (Driver 1985). Thus, sites in Plains settings should tend to have more antelope and jackrabbit, while those in mountains should have more deer and cottontails. This is certainly true for the Bonnell site, where deer are more common than pronghorn (Driver 1985).

All other sites in the comparative sample are located in Plains settings. As expected, pronghorn dominate deer in these assemblages, with one exception—Bloom Mound, which is located well within a Plains setting. Here, deer are more numerous than pronghorn, which appears to be attributable to the very small sample size and the fact that the deer, in this instance, are represented solely by antler fragments (Driver 1985).

The jackrabbit-to-cottontail ratios are also very interesting. In Plains settings, on the basis of environmental availability, we would expect jackrabbits to be more numerous. This expectation is met at both the early and the late Middle Pecos sites and at the Garnsey Spring Campsite. Jackrabbits in the assemblages from these sites are roughly twice as numerous as cottontails. However, at LA 68182, Bloom Mound, and Block Lookout, as well as at Bonnell, cottontails are in the order of 2.5 to 3 times more common than jackrabbits. The first three sites are within or on the edge of the Plains. Does this reflect a focus on the "garden hunting" near farm plots discussed by Linares (1976)? This strategy takes advantage of the fact that cottontails are attracted to fields and can be trapped with less trouble and time than would be the case if hunters were to go afield to hunt for meat. The Henderson site, located near Bloom Mound, also appears to fit this pattern (Rocek and Speth 1986), though actual figures are not yet available.

If true, then this has interesting implications regarding the degree of horticulture practiced at all of the sites, including those of the Middle Pecos. Just how much horticulture did the Middle Pecos people undertake? The implication from this perspective is that they did comparatively little. We suggest that the level of horticultural effort expended by the Middle Pecos people was basically minimal and helps to explain why they readily gave up farming in favor of full-time bison hunting, as suggested by Jelinek for the post-A.D. 1300 period.

The dominance of cottontails over jackrabbits at LA 68182 is more like that at the farming villages of Bloom Mound, Henderson, Block Lookout, and Bonnell. One possible explanation is the converse of that just mentioned for the Middle Pecos sites. That is, perhaps the LA 68182 inhabitants relied more on procuring cottontails as a byproduct of greater reliance on farm products (the garden hunting hypothesis). This has interesting implications for the origin of the occupants of LA 68182, as discussed below.

Bison is the most variable species represented in the comparative sample. The use of this animal by prehistoric and early historic Native Americans is the subject of great interest in recent archaeological literature. Much of this discussion revolves around the availability of these animals through time and for specific periods, whether the kills were made close to or far from the camps/villages (and therefore whether the meat was transported on the bone or as deboned meat packets), and whether the inhabitants of a given site did the actual hunting or traded for the meat.

Bison use at LA 68182 is one of the lowest in the comparative sample, but this probably reflects the fact that a larger number of utilized species and taxa were recovered. That is, the bison figures at LA 68182 are lower because there are more species and taxa in the assemblage than is the case for the other sites. More than anything else, this situation undoubtedly reflects the archaeological recovery techniques employed at LA 68182 and the better preservation afforded by the crevice.

Finally, the absence of fish at LA 68182 contrasts strongly with the faunal assemblages from nearby sites like the Henderson site (Rocek and Speth 1986), the Fox Place (Akins 2002), and Rocky Arroyo (Wiseman 1985). All four sites are situated along the Rio Hondo or its tributaries, which provided a ready water connection among all of the sites. Even if some natural catastrophe caused a die-out of fish along the Middle Berrendo, natural restocking from the Hondo should have happened quickly. Accordingly, fish should have been available to the inhabitants of LA 68182 for at least part of, if not all of, the lengthy time over which the site was intermittently occupied.

All of this raises one intriguing possibility, that the absence of fish may provide a clue to the former subsistence practices, and therefore the region of origin, of the LA 68182 inhabitants. Malainey et al. (2001), working from information for the Northern Plains, provide a detailed analysis as to why some peoples would have been at risk if they consumed fat-laden fish. It has been found that people who consume large quantities of lean meat, such as bison, over lengthy periods of time are at risk of lipid malabsorption. This condition can be debilitating, even life-threatening. Even though the problem can be circumvented in a number of ways, some bison-dependent peoples evidently developed a fish-avoidance pattern in their diets as one way of coping.

Were the LA 68182 inhabitants among these people? Even though they clearly were engaging in a broad-spectrum hunting and gathering economy while at LA 68182, did they still avoid fish as a matter of cultural tradition derived from a former subsistence pattern? Is fish avoidance our clue that the Los Molineros actually moved into the Roswell area from a region more centrally located within the Plains and that formerly they had been more dependent on bison? As discussed elsewhere in this report, excavations at LA 68182 yielded far more items made of Plains and possible Plains lithic materials than did Henderson, the Fox Place, and Rocky Arroyo.

Plant Resources

Two aspects of the prehistoric plant remains from LA 68182 are intriguing. One is that annual species were used almost to the exclusion of perennial species. As McBride points out (Chapter 13), this is at variance with assemblages from both Archaic and late prehistoric (pottery period) sites in the area, including habitation sites like the Sunset Archaic site, Henderson, the Fox Place, and others farther afield. Perennial species such as mesquite, yucca, and various cacti are more prominent at these sites.

One thought with regard to the infrequent showing of perennials at LA 68182 is that the Roswell area lies more within desert grassland, rather than desert scrubland where cacti and other economic perennials are generally more common. True as this may be, it should be remembered that two of the sites that have produced ample evidence of perennial use—the Fox Place and Henderson—are also located within desert grassland.

The other surprise is the degree to which corn remains were identified at LA 68182. Corn cupule fragments were recognized in 7 of the 20 samples that produced charred remains attributable to the prehistoric occupation. McBride (Chapter 13) suggests that this relatively high ubiquity of corn indicates that the occupants of LA 68182 were practicing horticulture, presumably along the Middle Berrendo immediately south of the site.

This idea is supported by the presence of several wild annual species—especially goosefoot, sunflower, purslane, and tansy mustard—all of which colonize disturbed ground. These plants are probably significant in this particular context because they often grow around Pueblo gardens and fields, whether the gardens are in use or not. Either way, they would be available as food for the next occupants of the site. In many ways, the LA 68182 assemblage looks like a typical Pueblo horticultural assemblage, virtually confirming that the LA 68182 people were farming at this location.

The grinding equipment at LA 68182 includes both stationary and portable basin metates and mortars. The numerous bedrock basin metates indicate a relatively long and/or intensive use of the location for grinding foodstuffs. Intensity of use of the location is also supported by the fact that every available space on the main bedrock outcrop was used for one of these features.

We assume that wild plant foods (goosefoot, purslane, sunflower, and dropseed) and the cultigen corn were ground in the bedrock basin metates (but probably not the mortars). The small size of these basin metates should be noted. We take this size—average 22.0 cm long, 14.8 cm wide, and 3.7 cm deep (n=53)—to indicate that all grinding episodes involved relatively small amounts of foodstuffs. Otherwise, we reason that if large quantities were being ground, larger grinding basins would have been used. Basin metates with twice the grinding area of the LA 68182 metates are present at farming villages like Bloom Mound and Henderson. Thus, while corn was present and perhaps grown at LA 68182, its contribution to the overall diet apparently was small.

This interpretation is supported by the manos recovered from LA 68182. Hard (1990), measuring the manos of 19 hunter-gatherer and agricultural groups in the Southwest, Great Basin, southern California, and northern Mexico, found a general correlation between degree of agricultural dependence and mano length. The 15 complete LA 68182 manos, which average 12.0 cm long (range 8 to 16 cm), fall between the Seri (average 11.6 cm) and the Ute (average 12.6 cm). Other groups with similar-sized manos are (average mano length in parentheses): Panamint (8.7 cm), Diegueno (13.8 cm), and Coahuila (10.5 cm).

The degree of agricultural dependence among these groups, as estimated by Murdock (1967; provided by Hard 1990:Table 10.1), was: Seri=0, Ute=0, Panamint=0, Diegueno=0, and Coahuila=2. The scale ranges from 0 to 8, with 8 being the highest level of dependence on cultigens. A value of 0 represents 0% to 5% dependence, 1 represents 6% to 15% dependence, and 2 represents 16% to 25% dependence. We have no ethnographic data by which to gauge agricultural dependence in the manner that Murdock has. However, given the average length of the manos and the small metate grinding surfaces, we suspect that the degree of dependence on cultigens exhibited by the LA 68182 people was in the order of 5%, or maybe 10% at the most.

Mortars are represented by both bedrock and portable examples at LA 68182. In spite of the fact that mortars, especially the bedrock type, have been noted at Southwestern and Plains sites for well over a century, surprisingly little about their use is documented. The primary question revolves around what substances were ground in them.

Ethnographic accounts have helped in this regard. Mortars have been used to grind a variety of foods throughout the American west. The most common appears to have been mesquite bean pods. Others include the seeds of saltbush, cotton, and palo verde. Archaeological documentation includes prickly pear in Texas and possibly black oak acorns in California (Wiseman 2000b).

Interestingly, remains of these plants were not recovered from LA 68182. Although palo verde and black oak do not grow naturally in the region, mesquite, prickly pear cactus, and saltbush do, and cotton has been documented in a prehistoric context at the nearby Henderson site.

However, the aboriginal distribution and density of mesquite growing under natural conditions in southern New Mexico has long been disputed. Today, it is a common plant in the Roswell area. Likewise, saltbush and prickly pear grow locally, but not in large numbers. Thus, several plants that are known to have been processed in mortars are present in the area and therefore could have been used at LA 68182.

Summary

Plant and animal remains were recovered from only one of the four project sites, LA 68182. This large and diverse assemblage, recovered from a refuse-filled natural crevice in the hilltop, provides a rare opportunity to assess plant and animal resource use dating to the late prehistoric (pottery) period in southeastern New Mexico.

The LA 68182 assemblage demonstrates that many species of animals, ranging from mussels to bison, were taken by the inhabitants. The most prominent species in terms of quantities of meat are the bison, deer, and pronghorn. At first glance, these species appear to have made far and away the most important contributions to the diet, especially in terms of quantity. However, because the meat of large animals is normally shared outside the immediate family of the successful hunter in preindustrial societies, less meat is available to any one individual, and the period of availability of that meat is shorter than might be assumed. The duration of availability, of course, is in part dependent on whether or not the meat is dried, made into pemmican, or otherwise rendered storable.

Conversely, the smaller animals (rabbits and smaller) are usually retained and consumed by the immediate family that acquires them. Thus, the smaller species probably had a greater role in year-round nutrition than might be expected.

We should also not forget the greater nutritional value offered by a diverse diet. Given the probability that the LA 68182 meat diet was probably greatly varied, the nutritional benefits must have been substantial.

Fish bones were not recovered from LA 68182 in spite of the fact that they were recovered in large numbers at other area sites like Henderson, the Fox Place, and Rocky Arroyo and would have been available in the Middle Berrendo river. The absence of fish may reflect dietary restrictions learned as a consequence of a former heavy reliance on lean meat, possibly bison. This could indicate that the people of LA 68182 once lived farther out on the Plains.

The plant remains recovered from LA 68182 flotation samples suggest that the plant diet was relatively restricted in variety. Corn evidently was being grown along the Middle Berrendo Creek at LA 68182. The several wild plant species represented in the LA 68182 assemblage (especially goosefoot, sunflower, purslane, and tansy mustard) are believed to have been part of the horticultural system. Being adapted to disturbed habitats, they probably grew naturally in and around the corn plots and could have been incorporated into the diet as a matter of routine. The nature of these particular plants, plus other species such as dropseed, scorpionweed, plantain, milkvetch, and bulrush, suggest that plant gathering activities were probably restricted to the site vicinity.

Many of the species just listed would have been processed on the bedrock and portable metates; the mortars, however, are problematic. No plants currently known or suspected of having been processed in mortars were present in the flotation assemblage from LA 68182. However, several of them—mesquite, saltbush, and prickly pear—are present in the area and could have been ground in the mortars.

CHAPTER 16

Summaries and Conclusions

LA 68182—Los Molinos

LA 68182 produced a number of surprises. This apparently shallow site with a few bedrock features and a thin artifact scatter situated on an essentially barren, rocky hill turned out to be so much more. In reality, several dozen bedrock grinding features were found. But more importantly, the site had a trash-filled crevice that was totally unexpected. Instead of a few dozen lithics, we recovered thousands of lithics, pottery sherds, fragments of animal bones, dozens of artifacts, and a human burial. Fortunately, the NMSHTD granted additional funds to explore these new finds in detail.

Site features include nearly 100 bedrock basin metates and mortars. These were arranged in four major groups, the groups apparently being dictated by the number of grinding places needed and the suitability of the available exposures of bedrock.

The crevice is natural. Evidently it was found by the Native Americans and cleaned out for use. The primary purpose we can think of is that it served as a shelter from the elements (especially cold winds). Although no direct evidence was found, we suspect that one or more brush shelters were erected over parts or the entirety of the crevice to form a kind of pit structure. If not used for human habitation, then perhaps a series of storage pits were constructed in the crevice.

Habitation or storage use of the crevice would have been fairly early in the occupation history simply because it later became a major refuse-disposal location. Unfortunately, prehistoric human disturbance and rodent burrowing mixed the deposits to the point that stratigraphic definition and fine-grained dating were not possible.

The only hearth found at the site was made of rock and was situated next to, and partly on, the main bedrock grinding feature locus in Group A. The totally exposed position of the hearth and its partial imposition on the grinding features makes it suspect as an aboriginal facility.

Dating of the site is based on pottery and projectile points. The few Paleoindian, Early Archaic, and Middle Archaic points are believed to have been brought to the site by the aboriginal inhabitants. The possibility of a Late to terminal Archaic occupation is suggested by the presence of a number of projectile points. The primary occupation, however, dates to the late prehistoric (pottery) period, with the earliest demonstrable occupation occurring about A.D. 900. Occupation before A.D. 900, potentially as early as A.D. 200 or 500 (beginning date of pottery making in the Sierra Blanca region), is possible.

Large quantities of animal bone and a number of flotation samples produced a wealth of subsistence information for the site as a whole. However, because of the mixed deposits, we cannot discern temporal differences in subsistence patterns (if such existed) and must characterize the data as a whole.

The faunal list from LA 68182 is extensive. It is clear that perhaps as many as 32 species, ranging from freshwater mussels to bison, were used to varying degrees. Whether the conservative approach or the adventurous route is taken to interpretation, the following numbers of species may have been used: 11 or 12 species show direct evidence of use; an additional 10 species were probably used, based on their larger body sizes and common use by prehistoric Native Americans elsewhere; and up to 11 other species could have been used, though the LA 68182 elements of these species lack evidence of use, their body sizes are small, and their habits make them difficult to capture.

However, virtually all of the species in this last group are documented to have been consumed by at least one (and usually more) historic period native groups in North America and northern Mexico. Although some of these species are reported as starvation foods, many more are not. This suggests that they were a “normal” part of the cuisine for at least some groups.

Even with this extensive list of used and potentially used animal species, it is clear that several provided the bulk of the dietary meat. These are, in order of most common to least common (NISP frequencies): cottontail, prairie dog, jackrabbit, yellow mud turtle, pronghorn, bison, muskrat, deer, gophers (Akins and Moga disagree with Wiseman on this), canid (dog, coyote, wolf), softshell turtle, and freshwater mussel. The remaining species, if used, were clearly used only on an opportunistic basis, but that basis could still have been important if the timing of their use fell between the kills of the preferred species. Timed in this manner, these species would help to even out the otherwise periodic availability of dietary meat for one or more people.

The amount of effort entailed in acquiring the various animal species by people based at LA 68182 is difficult to gauge. Because the site is situated on a hill next to permanent water, it is conceivable that all of the individual animals could have been captured (in some cases collected) literally within sight of LA 68182.

Contrary to other large faunal assemblages recovered from sites in the Roswell area, fish are noticeably absent at LA 68182. We speculate that this absence reflects intentional avoidance derived from a former economy focused heavily on lean meat, perhaps bison. This, plus a reasonable representation of Plains and possible Plains lithic materials at LA 68182 (again contrary to other Roswell area sites), may indicate that the Los Molineros moved into the Roswell area from a region farther out on the Plains.

The plants used by the occupants of LA 68182 included corn and several wild annual species, including goosefoot, sunflower, purslane, tansy mustard, and scorpionweed. The perennial bulrush is also present.

Four aspects of this plant assemblage are important. First, corn is sufficiently common to postulate that it was being grown near the site. This is in spite of the fact that no relatively permanent structures normally associated with farming sites are present at LA 68182. Nor do we know of any habitation sites within several kilometers of LA 68182.

Second, all species but bulrush are annuals that grow best in disturbed soils. They may well have grown alongside or among corn plants in the farm plots.

Third, the virtual absence of perennials is quite at variance with the floral assemblages recovered at contemporaneous sites in southeastern New Mexico. This includes habitation sites as well as more ephemeral sites (see Chapter 13).

Fourth, all of these plants, including the bulrush, could have been and probably were available in the valley bottom next to LA 68182. Their acquisition probably required a stroll downhill.

The presumed local gray chert at LA 68182 is of especially poor knapping quality—one of every six pieces of debitage is shatter or other unusable debris. The UV fluorescence study indicates that these materials are essentially identical to the materials at other sites in the area immediately north of Roswell. That signature differs significantly from the signature of at least two sites immediately south of Roswell (The Fox Place and Rocky Arroyo). Thus, the gray cherts are yet another indicator that the LA 68182 peoples obtained many of their resources in the vicinity of the site.

Durable goods like pottery, lithic materials, and artifacts from other regions are limited. However, the few trade items at LA 68182 represent a vast region extending from southwestern and west-central New Mexico on the west to the Texas Panhandle and west-central Texas on the east. Imported pottery (types made outside the Sierra Blanca/Roswell region) includes Mimbres Black-on-white from southwestern New Mexico, El Paso Polychrome from south-central New Mexico or far west Texas, Lino/Kana'a Gray from the Albuquerque/Grants region of central or west-central New Mexico, and Agua Fria Glaze-on-red (Rio Grande Glaze A Red) from central New Mexico (Socorro or Albuquerque region).

Imported lithic materials include obsidian from either the Las Cruces region of south-central New Mexico or the Jemez Mountains of north-central New Mexico, and Alibates material and Tecovas chert from the Texas Panhandle. One flake of possible Edwards chert is the only representative of the central Texas material recovered from LA 68182. Fully 80% of the imported materials (16 of 20 items) are in the form of projectile points, projectile point preforms, and miscellaneous bifaces. The four remaining pieces are flakes and include all of the clear obsidian recovered from LA 68182 and one possible Alibates piece.

A number of artifacts may have been brought in or traded in from the Plains. The most likely are the several projectile points (transitional Archaic dart points and both corner- and side-notched arrow points), preforms, and bifaces made of the imported materials just mentioned. However, these items differ only in materials from similar items made of local materials. That is, their form or style does not mark them as Plains artifacts.

A few other artifacts—two (probably four) wing-tip drills, a possible beveled knife, and two end-scrapers—do resemble Plains style items, but they are made almost entirely of local materials. However, none of the items is classic in form for Plains examples, and therefore none can be considered hard evidence of Plains origins.

The single human burial is that of a young woman. She was buried in the deepest part of the crevice, evidently fairly late in the period of trash accumulation. This suggests that she probably died around A.D. 1300. Akins (Chapter 14) finds that her dental and skeletal characteristics are very similar to those of the Henderson people (Rocek and Speth 1986; Speth 1997) and indicate three salient facts. She suffered episodic stress during her first few years of life, she had a mobile lifestyle, and she subsisted on a diet low in sticky foods such as corn. That is, she was basically a hunter-gatherer who evidently consumed only small quantities of corn, if any at all.

In conclusion, LA 68182 is both enigmatic and fascinating in many ways. The site was obviously a major center for grinding foodstuffs. It was used over a period of at least a few hundred years (A.D. 900 to 1400?) and perhaps for a thousand years or more (300 B.C.? to A.D. 1400?). For an open site, the crevice at LA 68182 provided rare preservation of large quantities of prehistoric refuse; the light that such refuse sheds on ancient activities has been both revealing and somewhat confusing. For instance, the crevice may initially have been roofed in some manner to provide shelter from the elements. Refuse deposited after that time documents rather intensive use of the location, probably on a seasonal or intermittent basis. The people evidently did some farming of corn, and they used several wild plant foods that grew in conjunction with the soil disturbance that accompanies farming. Notably absent are perennial plant foods that are so common in other sites of the Roswell area in particular and southern New Mexico in general. The plant foods of LA 68182 indicate a focus on plants in the immediate vicinity of the site. The faunal remains attest to a meat diet of great breadth, involving many terrestrial and riparian species ranging in size from freshwater shellfish to bison. Fish are curiously absent, again in strong contrast to nearby contemporaneous sites. Although acquisition of these various plant and animal species may have involved treks away from LA 68182, it is also possible that all of them could have been taken within sight of the site, being located as it is on a high hill next to reliable water. The LA 68182 occupants relied on other local resources such as the decidedly inferior cherts. However, they were well acquainted with and used the better quality Plains and northern New Mexico lithic materials and artifact forms. The one human burial recovered from the site is similar in most respects to those who inhabited the nearby Henderson site, but the fact that the LA 68182 people did not eat fish suggests that they were not ethnically the same as the occupants of Henderson. This assumes, of course, that LA 68182 was not used by more than one ethnic group. Above all, the author agrees with Dr. John Speth, who investigated the Henderson site, that these people may have been local hunter-gatherers who tried the farming way of life for a while, then returned to a hunting and gathering lifestyle, this time focused on bison hunting.

LA 68183—The Camp

LA 68183 initially appeared as a small campsite composed of (probably) four hearths and scattered artifacts. Only one of the hearths remained intact, suggesting two or more occupations during which the rocks of the earlier hearths were displaced by later occupants. The surface artifacts numbered fewer than 30 items and included only two temporally diagnostic pieces, a corner-notched arrow point and a Jornada Brown sherd. The sherd, noted and described during the survey phase, could not be relocated or collected during the excavation phase. As discussed in greater detail in the section on LA 54347 (below), hindsight and subsequent experience suggest that this site would have benefitted from an additional 100 to 200 square meters of excavation.

The chronometric data are currently unsettled. The arrow point and pottery sherd indicate a late prehistoric occupation, and the large rock hearth suggests a Late to terminal Archaic occupation. We suspect, but cannot yet demonstrate, that this type of hearth dates later than currently documented and that all three indicators—pottery, projectile point, and hearth type—are actually in agreement. If true, LA 68183 was the scene of two or more occupations within the late prehistoric period, A.D. 700 to 1200. No carbon was found, which precluded the use of radiocarbon dating.

The UV light study indicates that the gray cherts are essentially identical to the gray cherts at other sites in the area immediately north of Roswell.

The only imported item recovered from LA 68183 is a single flake of probable Edwards chert. Nor were any Plains or Plains-like artifacts recovered.

By all indications, LA 68183 was occupied only briefly and for a limited purpose. It is possible that the occupants were using the bedrock grinding features at LA 68182 during the day and camping/eating/sleeping at LA 68183 at night. However, we have no way of testing the validity of this notion.

LA 54347—White Paint

LA 54347 initially appeared to be a large camp that was basically located on the modern surface. Furthermore, the paucity of surface artifacts and the proximity of the site to Roswell gave the appearance that the site had been denuded of artifacts by collectors. Accordingly, intensive surface artifact and burned rock inventories were conducted, but excavation was minimal.

The effort expended met the archaeological standards of five years ago. If we started this project today, we would excavate 1000 to 2000 square meters of site area, probably in one large block. More recent projects conducted in this manner by the OAS have shown that such efforts are well compensated in terms of artifact-recovery rates, discovery of site features (including structures), and elucidation of intrasite patterning, even at sites where the excavation depth averages as little as 5 cm, and even at sites that have been heavily surface-collected.

The core site area, as defined by the concentration of surface artifacts and burned rocks, measured 75 m east-west by 35 to 40 m north-south. Cultural debris (artifacts and burned rocks) continue beyond these limits for several dozen meters in all directions.

The limited subsurface investigation at this site revealed only one intact hearth, and that was visible on the surface. It is clear from the thousands of burned rocks scattered across the site that many more hearths and perhaps other kinds of thermal features were also present. Given the variety of artifact types recovered from the site, other features like small cache pits, larger storage pits, and wickiup floors may also have been present.

Information about subsistence and other activities is inferred from the artifact assemblage. The ground stone, projectile points, scrapers, drill, and knapping debris indicate that a number of daily living activities took place at the site; a base camp function, rather than a limited activity function, is indicated. The acquisition, processing, and consumption of both plant and animal foods is implicated.

A variety of occupation periods is indicated by the few projectile points recovered from the site. Because each period is represented by only one or two points, we lack frequency data to assess whether the site was actually occupied during each of the periods or whether some of the points were brought in by later peoples for recycling. The large size of the site is certainly congruous with the idea of multiple occupations over several centuries, that is, if we are correct in assuming that the site grew by lateral accretion. We believe this to be true, but cannot demonstrate it.

The periods suggested by the projectile points include the Late Archaic, the terminal Archaic, and perhaps the early late prehistoric periods. Approximate calendar dates are 1000 B.C. to A.D. 1150. No carbon was found, precluding the use of radiocarbon dating.

The UV light study indicates that the gray cherts are essentially identical to the gray cherts at other sites in the area immediately north of Roswell, and differ from the assemblages of sites on the southern outskirts of Roswell.

One interesting aspect of the supposedly tan cherts at LA 54347 is the fact that this site produced far more tan chert than any other site on this project. During the analysis, it became evident from occasional nicks and breaks on some of these flakes that many, if not all, of these flakes are actually heavily patinated *gray* chert. A local collector has reported that the source of this material is in the Cedar Hills area along the upper reaches of Salt Creek, 40 to 50 km northwest of Roswell. This report has not yet been confirmed.

The imported lithic materials at LA 54347 are all from the Texas Panhandle, west-central Texas, and possibly northeastern New Mexico. They include Alibates material, possible Alibates, Tecovas chert, possible Tecovas, Alibates/Tecovas lookalikes, Edwards chert, and possible Edwards.

The only Plains or Plains-like artifact from LA 54347 is a fragment of a wing-tipped drill made of a local/regional material.

LA 68185—Sitio Largo

All of the information from this site was collected during the survey and testing phases conducted by the OAS, and during a later materials pit survey by Lone Mountain Archaeological Services. Only the far western end of the site was "clipped" by the highway project. Although a hearth in that area was supposed to be excavated during the data recovery phase, it was buried by flood silt between the testing and data recovery phases.

The site is similar to LA 54347 and is located on the opposite bank of the river from that site. At the survey level, it appears to be a large campsite with occasional hearths, abundant burned rock, and sparse surface artifacts. We assume that most of the surface artifacts were picked up long ago by local collectors. The site, visible mostly on the terrace slope, has been moderately to severely eroded over the past century. Given the variety of artifact types recovered from the site, features such as small cache pits, larger storage pits, and perhaps wickiup floors may be present in preserved sections of the site.

Information about subsistence and other activities is inferred from the artifact assemblage. The ground stone, projectile points, scrapers, and knapping debris indicate that a number of daily living activities took place at the site; a base camp function, rather than a limited activity function, is indicated. The acquisition, processing, and consumption of both plant and animal foods is implicated.

Like LA 54347, a variety of occupation periods is indicated by the few projectile points recovered from the site. Because each period is represented by only one or two points, we lack frequency data to assess whether the site was actually occupied during each of the periods, or again, whether some of the points were brought in for recycling by later occupants. The large size of the site is certainly congruous with the idea of multiple occupations over several centuries, that is, if we are correct in assuming that the site grew by lateral accretion. We believe this to be true, but cannot demonstrate it.

The periods suggested by the projectile points include the Middle Archaic, Late Archaic, terminal Archaic, and historic periods. Plains end-scrapers suggest occupation during either the late prehistoric or the protohistoric/early historic period. Approximate calendar dates are 3000 B.C. to A.D. 750 for the Archaic periods, A.D. 1100/1200 to 1541 or 1541 to 1750 for the late prehistoric and protohistoric periods (specifically following Boyd 1997 with regard to the dating of the Plains style end-scrapers), and the eighteenth or nineteenth centuries for the historic period. No carbon was found, precluding the use of radiocarbon dating.

The few gray chert flakes from LA 68185 were not subjected to the UV analysis.

Given the relatively few artifacts recovered from LA 68185, it is not surprising that almost no imported materials are present in the collection. The only item of imported lithic material is a classic Plains style end-scraper made of Alibates material. This item was obviously made on the Plains and either traded into the area or else carried in by one of the LA 68185 occupants.

The metal arrow point, of course, was brought in (most likely) by an Apache (possibly a Mescalero or Lipan), Comanche, Kiowa, Kiowa-Apache, or Cheyenne. It is also possible that a New Mexico Hispanic *comanchero* (trader with the Comanche) or *cibolero* (buffalo hunter) was responsible for the point ending up at LA 68185. They, too, used bows and arrows when guns or powder and ball were absent or too scarce to waste.

Prehistoric Occupation of the Rio Berrendo System at Roswell

The four sites investigated under this project lie within the middle reaches of the Berrendo River system. The middle reaches of these streams are situated along the western margin of the Pecos Valley, the broad valley of the north-south-trending Pecos River to which the Berrendos are tributary. This position is intermediate in elevation to the central Pecos Valley to the east and the headwaters of the Berrendos in the limestone hills to the west.

The prehistoric occupations of this area appear to have consisted mainly of encampments, probably of hunter-gatherers. The primary periods of occupation include the late prehistoric period (ca. A.D. 500/900 to 1400), and probably the terminal Archaic (ca. A.D. 1 to 750?) and Late Archaic (1000 B.C. to A.D. 1) periods. We envision that the area was used throughout prehistory and right into historic times. The important questions at this point involve the periodicity of use (periods of relatively heavy versus light use), nature of use (hunting-gathering versus farming), and reasons behind those uses. As usual, the details of those occupations and the people(s) responsible for them will be very interesting, though difficult, to elucidate.

Three of the sites investigated by this project display sufficient variety in the artifact assemblages to suggest that many of these sites served as base camps. Plant and animal food processing (and presumably consumption), hide working, artifact manufacture and maintenance, and cooking/heating are all implicated. The extraordinary quantities of cultural refuse at LA 68182 indicate intensive occupations. We infer that the duration of the occupations at LA 68182 and (presumably) at some of the other sites in the area were in the order of several weeks or a few months. Both shorter and longer occupations undoubtedly took place at these locations as well.

At least one site, again LA 68182, indicates that limited corn farming was practiced. The large number of bedrock grinding features, especially basin metates, at LA 68182 attests to the importance of the location for processing plant foods. The plant food inventory from the site suggests collection of wild plant foods from within a rather restricted radius of the site. We suspect that at least one other site in the area, as yet unrecorded, witnessed similarly intense occupations involving farming.

Exploitation of animal resources, if LA 68182 is any indication, indicates wide-spectrum hunting and gathering. Many species were used, many of them possibly on an opportunistic basis, but several species formed a list of preferred meats. These include a number of smaller-bodied species like turtles, freshwater mussels, and gophers, as well as the usual large-bodied species like bison, antelope, deer, jackrabbit, cottontail, and prairie dog. It should have been possible to take all of these species within a kilometer or two of sites situated along the three Berrendos. The main reason for this is the fact that, until recent times, all three streams supplied reliable water year round and would have been major watering points for all animals in the area.

Not all sites in the area were base camps. The fourth site investigated by this project is LA 68183, a small camping location that was probably occupied for a few days at most, probably on two or more occasions. This site was presumably occupied for reasons of limited economic scope, perhaps in this case to use the grinding facilities at LA 68182 without camping on the hilltop. The frequency of this site type in the Roswell area is unknown.

Basically all of the evidence garnered by this project suggests that the people were long adapted to the Roswell area. The presence of artifact types and materials from other regions both east and west clearly indicates some degree of familiarity with and access to distant peoples and their products. The social and economic situation in southeastern New Mexico created few, if any, constraints on the movement of goods, but the skeletal data, tentative as they are, suggest that the interregional movement of large groups of peoples ("tribes" as opposed to individuals and small parties of traders) may have been a recent (historic) phenomenon.

While the evidence acquired from the project sites suggests that the Roswell area produced a veritable wealth of animal and plant resources, the human skeletal material indicates that the area was not a utopia. The one individual recovered by the project clearly displays evidence of a difficult childhood. Once attaining adulthood, however, life appears to have become easier. The same individual displayed a relative absence of pathologies attributable to the teen years. The efficacy of this interpretation would certainly benefit from knowledge of how that particular individual died, but we lack that information.

So, who were these people? Again the sample is too small to be definitive, but, skeletally, the one individual from LA 68182 is very similar to those described for the Henderson site. According to Rocek and Speth (1986), the Henderson population can be distinguished from Puebloan peoples to the west and Plains peoples to the east and south. The implication is that we have here a people who lived in the Roswell region long enough to constitute a subpopulation.

Furthermore, if we overlook the absence of substantial structures at LA 68182 and compare the material culture inventories and lists of plants and animals, both sites are very similar. The only immediately obvious differences are the differences in metate types, the presence of Plains lithic materials at LA 68182, and the absence of fish at LA 68182.

Of these differences, only the absence of fish is sufficiently important to potentially, though not necessarily, negate what we believe to be the more likely interpretive scenario for LA 68182. As discussed in earlier sections of this report, the absence of fish may be a clue to an earlier economic stance of the LA 68182 inhabitants, in which they were heavily dependent on lean meat (e.g., a bison-hunting economy), had adopted an aversion to eating fish in order to avoid a lipid malabsorption problem, and therefore had probably formerly lived in a more central Plains environment.

What does all of this mean? Speth has posited one intriguing possibility over the last decade or so (Rocek and Speth 1986; various personal communications with Wiseman; see Jelinek 1967 for an early formulation of this idea). That is the notion that the people at Henderson were originally local hunter-gatherers who abandoned the chase and took up farming and living in substantial architecture (large pithouses and pueblos). They lived in this manner for several generations. Then, for reasons not yet fully understood, they apparently abandoned their houses and farming and reverted back to the hunter-gatherer lifestyle, this time focusing on bison. This whole process may have occurred over a period as short as 150 years, beginning in the A.D. 1200s and ending in the 1300s or early 1400s.

It seems probable that LA 68182 was part of this phenomenon, that it represents the early period leading to the establishment of Henderson and similar sites. Although the LA 68182 burial is not securely dated, a ca. A.D. 1300s date appears viable. Indicators of an earlier date, rather than a later one, for the majority of the LA 68182 occupations are the relatively low percentage of bison in the faunal assemblage and the near absence of fourteenth century pottery types.

This interpretation of LA 68182 and the other project sites leaves myriad unanswered questions and only slightly fewer problems, but the data do provide ample reason for reflection. This interpretation also poses a series of very interesting—and exciting—possibilities for future research in the region.

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APPENDIX 1

LA 68182: Bedrock Grinding Feature Data

Individual Bedrock Features (BRF = Bedrock Feature)					
	Dimensions (cm)				
BRF No.	Length	Width	Depth	Rock Type	Condition
Metate					
BRF Group A					
1	24	14	3	conglomerate	good
2	12	9	1	conglomerate	good
4	20	16	3	conglomerate	poor
6	24	17	4.5	limestone	good
7a	19	12	3	limestone	good
10	19	14	5	limestone	poor
15	17	16	4	limestone	good
22	14	9	1	limestone	good
23	26	18	4.5	limestone	good
25	20	13	5	limestone	poor
26	15	14	5	limestone	poor
27b	18	12	2.5	limestone	good
28b	12	9	1.5	limestone	good
30	25	16	10	limestone	good
31	21	15	4.5	limestone	poor
34	24	15	6.5	limestone	poor
35	26	16	3	limestone	good
37a	22	14	4	conglomerate	good
37b	16	12	2	conglomerate	poor
38	16	11	3	conglomerate	poor
39	22	16	5	limestone	good
40	27	21	7.5	limestone	good
41	21	15	4	limestone	good
BRF Group B					
43	28	17	5.5	limestone	poor
45a	22	12	3	limestone	poor
BRF Group C					
48	21	17	3	limestone	poor
50	20	12	1.5	limestone	good
51a	16	12	2	limestone	good
52	24	16	3	limestone	good
56	20	13	2	limestone	good
59	17	15	2	conglomerate	poor
60	23	14	2.5	conglomerate	poor
61	22	12	2	conglomerate	poor
62	21	15	3	conglomerate	good
64	26	15	3	limestone	good
67	18	10	2	limestone	good
BRF Group D					
68	24	15	3	conglomerate	poor
70	22	14	2.5	conglomerate	good
71	21	12	3	conglomerate	good
72	23	13	4	conglomerate	good
73	17	12	3	conglomerate	good
74	26	14	5	conglomerate	good
75	15+	16+	3	conglomerate	poor
77a	15	11	3	conglomerate	good
77b	22	13	2	conglomerate	poor
79	17	12	7	conglomerate	good
80a	17	14	4	conglomerate	good

Individual Bedrock Features (BRF = Bedrock Feature)					
	Dimensions (cm)				
BRF No.	Length	Width	Depth	Rock Type	Condition
Mortar					
BRF Group A					
5	22	17	20	limestone	good
7b	9	7	2.5	limestone	good
8	22	18	23	limestone	good
9	24	18	19	limestone	good
11	17	14	10	limestone	good
12	10	10	3	limestone	good
16	9	9	2.5	limestone	good
17	18	18	22	limestone	good
19	20	18	9.5	limestone	good
20	22	19	21	limestone	good
21	20	19	20	limestone	good
27a	21	20	24	limestone	good
28a	10	9	3	limestone	poor
32	21	17	21	limestone	good
33	22	17	18	limestone	good
BRF Group D					
76	15	13	9.5	conglomerate	good
78	22	17	20	conglomerate	good
Natural?					
BRF Group A					
29	16	13	1.5	limestone	good
42	21	14	3	conglomerate	poor
BRF Group B					
45b	25	16	3	conglomerate	poor
BRF Group C					
46	22	15	3	conglomerate	poor
47	25	15	3.5	conglomerate	poor
51b	19	14	1	limestone	poor
53	20	13	2	limestone	poor
54	16	13	2	limestone	poor
55	17	14	2	limestone	poor
57	23	17	3.5	limestone	poor
58a	26	16	2	conglomerate	poor
58b	21	15	2.5	conglomerate	poor
BRF Group D					
69	25	17	4.5	conglomerate	poor
80b	21	12	1	conglomerate	poor

Combination Bedrock Features (BRF = Bedrock Feature)								
	Dimensions (cm)							
	Metate			Mortar				
BRF No.	Length	Width	Depth	Length	Width	Depth	Rock Type	Condition
BRF Group A								
3	17	15	4	13	9	3	conglomerate	good
13	30	21	5	15	12	4	limestone	good
14	18	13	2	11	9	2	limestone	good
18	32	21	5	15	13	5	limestone	good
24	25	17	3.5	12	10	3.5	limestone	poor
36	24	17	2.5	9	8	2.5	limestone	poor
BRF Group B								
44	26	18	5	13[1]	9	5	limestone	poor
BRF Group C								
49	24	16	2.5	11	9	2	limestone	poor
63	19	13	1	10	10	2	conglomerate	poor
65	19	19	3	10	10	2	limestone	good
66	29	19	3.5	20[2]	11	3	limestone	poor
BRF Group D								
81	32[1]	21	4	14	12	4	limestone	poor

[1]May be natural rather than cultural.
[2]Second surface is a metate.

APPENDIX 2

LA 68182: One-Hand Mano Data

One Grinding Surface, Complete

	Provenience				Dimensions				Grinding Surface	
	Meters				Length	Width	Thickness	Weight	Shape or	Development
FS No.	N	W	Level	Material	(mm)	(mm)	(mm)	(g)	Curvature	or Use-Wear
719	20	13	5	fine siltite	163	107	63	1351	moderate	heavy
757	22	21	5	limestone	104	92	53	777	strong	medium
784	20	11	7	purple quartz	80	66	55	436	flat	medium
825	21	10	9	white sandstone	107	106	54	971	flat	heavy
832	21	9	5	monzonite	109	80	55	606	flat	heavy
968	19	15	2	limestone	123	82	62	962	strong	medium
978	19	16	5	monzonite	139	127	68	1591	moderate	weak
1021	23	24	3	limestone	135	123	77	1612	moderate	heavy
1022	23	24	2	limestone	133	124	92	1917	strong	weak

One Grinding Surface, Broken

	Provenience				Dimensions				Grinding Surface	
	Meters				Length	Width	Thickness	Weight	Shape or	Development
FS No.	N	W	Level	Material	(mm)	(mm)	(mm)	(g)	Curvature	or Use-Wear
419		surface		monzonite	69+	45+	39	187+	flat	medium
425a	20	14	3	limestone	69+	42+	53+	153+	flat	heavy
425b	20	14	3	limestone	62+	42+	42+	144+	flat	heavy
428	20	14	5	limestone	36+	66+	59+	195+	moderate	weak
444	24	20	2	monzonite	60+	82+	39+	198+	flat	heavy
454a	20	21	2	limestone	52+	76	36	178+	moderate	medium
454b	20	21	2	sandstone	58+	45+	40+	101+	moderate?	weak
720	20	13	5	sandstone	61+	47+	22+	40+	moderate	medium
767	20	12	5	limestone	75+	65+	27+	173+	flat	weak
798	21	11	2	sandstone	37+	72+	17+	44+	flat	heavy
841	22	10	2	monzonite	82+	92+	50+	453+	flat	heavy
916	19	13	4	monzonite	57+	65+	40+	199+	flat	medium
1032		surface		sandstone	46+	83+	50+	227+	strong	medium
1033		surface		sandstone	51+	76+	24+	110+	flat	heavy

+ indicates incomplete (fragment) measurement.

Two Grinding Surfaces, Complete

	Provenience				Dimensions				Grinding Surface	
	Meters									
FS No.	N	W	Level	Material	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Shape or Curvature	Development or Use-Wear
469	24	3	3	limestone	119	95	63	1028	flat flat	medium medium
854	22	9	5	monzonite	131	126	58	1308	flat moderate	weak medium
894	23	23	4	light gray sandstone	105	91	60	1015	flat flat	medium medium
984	20	16	3	white sandstone	107	105	64	993	flat moderate	medium medium
1023	23	24	4	limestone	137	109	57	1094	flat flat	weak medium
1031	disturbed			fine sandstone with hematite	102	76	35	425	flat flat	weak heavy

Two Grinding Surfaces, Broken

	Provenience				Dimensions				Grinding Surface	
	Meters									
FS No.	N	W	Level	Material	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Shape or Curvature	Development or Use-Wear
286	surface			sandstone	112+	50+	35+	280+	flat flat	medium medium
753	22	21	2	sandstone	63+	43+	27+	121+	flat flat	medium heavy
922	21	6	3	limestone	55+	81+	65+	304+	moderate moderate	weak heavy
988	20	17	1	monzonite	65+	68+	45+	248+	flat flat	medium heavy

+ indicates incomplete (fragment) measurement.

Unknown Number of Grinding Surfaces, Broken

	Provenience				Dimensions				Grinding Surface	
	Meters									
FS No.	N	W	Level	Material	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Shape or Curvature	Development or Use-Wear
763	20	12	3	limestone	51+	60+	23+	87+	flat	medium
834	21	9	6	limestone	83+	95+	50+	491	moderate	weak
861	22	22	2	sandstone	70+	55+	32+	139+	flat	medium
964	20	15	4	limestone	71+	57+	44+	204+	moderate	heavy

+ indicates incomplete (fragment) measurement.

APPENDIX 3

LA 68182: Metate Data

Shaped Basin Metates

FS No.	Provenience Meters N	Provenience Meters W	Provenience Level	Material	Dimensions Length (mm)	Dimensions Width (mm)	Dimensions Thickness (mm)	Grinding Surface Depth (mm)	Remarks
729	21	18	4	micaceous tan sandstone	90+	90+	29	5+	flaked and ground edge; burned
731	21	18	5	micaceous tan sandstone	84+	88+	24	5+	flaked edge; burned
765	20	12	4	white sandstone	82+	71+	49	7+	ground edge
798	21	11	2	medium red sandstone	85+	84+	48	22+	ground edge
842	22	10	2	white sandstone	48+	76+	36	14+	flaked and slightly ground edge
902	24	22	3	medium red sandstone	69+	84+	27	13+	ground edge; possibly burned
1024	23	24	4	micaceous dirty sandstone	42+	91+	38+	8+	natural edge; grinding surface goes to edge; partly burned
1025	23	24	4	tan sandstone (limonitic)	88+	79+	13+	8+	edge minimally flaked to shape

+ indicates incomplete (fragment) measurement.

Unshaped Basin Metates

FS No.	Provenience Meters N	Provenience Meters W	Provenience Level	Material	Dimensions Length (mm)	Dimensions Width (mm)	Dimensions Thickness (mm)	Grinding Surface Depth (mm)	Remarks
748	21	21	5	coarse hematitic sandstone	60+	52+	53	6+	thick for this assemblage
763	20	12	3	white sandstone	58+	35+	11+	1+	tiny fragment
773	20	12	8	light red sandstone	49+	65+	29	5+	probably not burned
777	20	11	3	white sandstone with dark grains	60+	67+	26	7+	-
782	20	11	7	dirty sandstone	69+	93+	27	11+	edge not shaped; grinding surface goes to edge
791	21	12	3	limestone	132+	65+	58	1+	made from large cobble?; barely worn (i.e., new)
802	21	11	4	limestone	41+	47+	57	7+	-
804	21	11	5	dacite?	51+	68+	66	2+	natural shape (squarish) cobble; thick; minimal wear
993	20	17	5	micaceous red sandstone	69+	53+	31	6+	burned

+ indicates incomplete (fragment) measurement.

APPENDIX 4

LA 68182: Projectile Point Data

Notes If the part is a **base**, it is usually the stem plus a small part of the blade.

If the weight is given for **near complete** specimens, the missing part is estimated to have weighed 0.1 g or less and is included in the value given.

+ indicates incomplete measurement because of breakage.

Paleoindian Archaic

FS No.	Provenience: Meters N	W	Level	Type Material	Part	Dimensions (mm, g): Length	Width	Thick-ness	Neck Width	Weight	Remarks
325	surface			stemmed dart point tan chert	base	12+	15+	4+	na	-	edge ground; small for Paleoindian
367	surface			lanceolate dart point light gray-tan chert	base	25+	19+	6+	na	-	edge ground; Paleoindian looking; small, reworked
445	24	20	3	lanceolate dart point medium brown-gray chert	base	18+	26+	5+	-	-	Clovis type; base and edge well ground
788	21	12	2	stemmed dart point light to medium gray chert	base	26+	19+	5.5	17	-	edge ground; Meserve/Dalton?

Early Archaic

FS No.	Provenience: Meters N	W	Level	Type Material	Part	Dimensions (mm, g): Length	Width	Thick-ness	Neck Width	Weight	Remarks
969	19	5	5	stemmed dart point tan chert	near complete	35+	21+	6+	na	-	edge ground; Archaic; reworked
989a	20	17	2	stemmed dart point light tan-gray chert	near complete	45	20	10	17	9.1	Jay type; reworked on one edge

Middle Archaic?

FS No.	Provenience: Meters N	W	Level	Type Material	Part	Dimensions (mm, g): Length	Width	Thick-ness	Neck Width	Weight	Remarks
436	24	7	1	side-notched dart point fine, light gray quartzite	base	21+	24+	5+	18.5	-	Ellis-like, reworked
982	20	16	2	corner-notched dart point light brown-gray cherty silicified siltstone	base	14+	24+	5+	18	-	Ellis-like

Late Archaic

FS No.	Provenience: Meters N	W	Level	Type Material	Part	Dimensions (mm, g): Length	Width	Thick-ness	Neck Width	Weight	Remarks
924	23	5	1	corner-notched dart point white and light orange chalcedonic chert	base	29+	24+	5	16	-	

Late/Terminal Archaic												
	Provenience					Dimensions (mm, g)						
	Meters											
FS No.	N	W	Level	Type Material	Part	Length	Width	Thick-ness	Neck Width	Weight	Remarks
821	21	10	7	side-notched dart point white and light brown chert	near complete	33+	15+	5	13	3.1	
981	20	16	1	side-notched dart point light tan to brown chert	near complete	34+	18	3.5	14	2.6	reworked blade
98	surface			corner-notched dart point light gray banded chert (#4)	near complete	36	18	5	13	3.7	probably heat-treated
918	19	13	6	corner-notched dart point light gray and gray-brown chert	near complete	19+	19+	7+	13	-	Hueco type

Terminal Archaic (by Notching Direction)											
	Provenience					Dimensions (mm, g)					
	Meters										
FS No.	N	W	Level	Type Material	Part	Length	Width	Thick-ness	Neck Width	Weight	Remarks
744	21	21	2	basally notched dart point Tecovas lookalike	base	23+	15+	5+	9	-	heat-treated; impact fracture; same material as side-notched arrow point 765 and projectile point preform 744.
1003	24	21	1	basally notched dart point light to medium brown and orange chert	near complete	32.5	19	4.5	12.5	2.8	Carlsbad type; heat-treated
184	surface			corner-notched dart point tan to light gray chert	near complete	26	15	6	9.5	2.4	partly reworked
320	surface			corner-notched dart point light and dark gray, and dark red chert	near complete	24+	14	4	10.5	-	not Alibates material
459	20	4	2	corner-notched dart point light brown chert	complete	30	13	4	10	1.3	reworked blade
475	22	16	1	corner-notched dart point light-medium gray chert with orange	blade	23+	18+	3	10.5	-	Hueco type; heat-treated; finely flaked
759	22	21	7	corner-notched dart point fingerprint chert	near complete	26+	18+	5	12.5	-	reworked but probably corner-notched
792	21	12	4	corner-notched dart point red chert	near complete	24+	16+	4.5	10	-	Tecovas lookalike
850	22	9	2	corner-notched dart point medium orange to dark gray-red chert	blade	27+	23+	5.5	10.5	-	Ellis-like
969a	19	15	3	corner-notched dart point tan to light gray chert	near complete	24+	14+	5+	9.5	-	reworked
992	20	17	5	corner-notched dart point brown specked light gray cherty silicified siltstone (?)	blade	22+	20+	5+	9	-	Hueco-like
1016	23	25	3	corner-notched dart point medium gray-orange chert	near complete	25+	17+	4.5	10	-	Hueco type; one face 50% covered with cortex
1006	24	26	1	side-notched dart point light brown-gray cherty siltstone	near complete	33	16	7	9	2.8	untyped

Early Corner-Notched Arrow Points (Transitional Dart to Arrow)

FS No.	Provenience: Meters N	W	Level	Material	Part	Dimensions (mm, g): Length	Width	Thick-ness	Neck Width	Weight	Remarks
856	22	9	6	light gray-brown chert	complete	22	15	3.5	8.5	1	
961b	20	15	2	light gray chert	blade	15+	13+	1.5+	8	-	
985b	20	16	4	medium gray and orange chert	near complete	21	13+	2.5	8.5	-	heat-treated

Corner-Notched Arrow Points

FS No.	Provenience: Meters N	W	Level	Material	Part	Dimensions (mm, g): Length	Width	Thick-ness	Neck Width	Weight	Remarks
131	surface			hazy gray obsidian	base	8+	14+	3+	-	-	
222	surface			coarse medium gray chert	base	19+	16	4.5	6.5	-	tip missing
289	surface			orangish gray and brown chert	base	21+	15+	5+	7	-	heat treated?
300	surface			pink and gray chert	base	15+	12+	3+	5.5	-	badly fragmented
439	24	13	1	light gray-tan chert	near complete	24+	14	5	7	1.3	badly fragmented.
442	24	20	1	medium gray-brown chert	blade	13+	10+	2.5	5	-	
456	24	25	2	medium gray-brown chert	near complete	18+	11	2.5	4	0.6	
473	22	12	2	orange-rose chert	blade	18+	17+	3+	3.5	-	finely flaked
715	20	13	2	light gray chert	blade	7+	13+	3+	5	-	base only
756	22	21	5	Alibates	base	7+	8+	4.5+	6.5	-	stem only
792	21	12	4	tan chert	complete	19	10	2.5	6.5	0.5	edge-trimmed flake
816	21	10	2	light to dark chert with white speckles	blade	26+	15+	3	4.5	-	finely flaked
833	21	9	6	light gray chert	blade	24+	14	4.5	7	-	
840	22	10	2	mottled light gray chert	base	9+	13+	3+	7	-	stem only
849	22	9	1	white and light-medium gray chert	base	16+	12	4	6.5	-	
880	22	23	2	clear gray chalcedony	base	15+	12	3	5.5	-	
891	23	23	3	mottled light gray chert	base	17+	16+	4	8	-	
893	23	23	4	medium-dark brown-gray chert	blade	30+	14	3.5	4.5	-	
895	23	23	5	gray and orange chert	base	7+	14+	3+	8	-	heat-treated
896	23	23	6	medium and dark gray cherty siltite	near complete	21+	16	4	8	-	
918	19	13	6	white and yellow chalcedony	base	8+	8+	2.5+	5.5	-	
919	21	6	1	light orange and grey chalcedonic chert	base	9+	9+	2.5+	5	-	possibly heat-treated
999	18	14	5	light to dark gray and brown-gray chert	near complete	24+	15+	5	7	-	reworked tip
1016a	23	25	3	off-white chert	near complete	25+	16	4	6	-	
1016b	23	25	3	off-white chert	near complete	22+	13+	3.5	5.5	-	impact-fractured tip
1056	19	12	?	red and yellow chert	near complete	19+	16+	4+	7+	-	Alibates lookalike; heat-treated; reworked

Side-Notched Arrow Points											
	Provenience					Dimensions (mm, g)					
	Meters							Thick-	Neck		
FS No.	N	W	Level	Material	Part	Length	Width	ness	Width	Weight	Remarks
87a	surface			clear chalcedony with red	base	11+	11+	2	4.5	-	
87b	surface			medium gray chert	base	15+	12+	2.5+	5	-	reworked blade
739	22	18	3	light yellow and gray chert	near complete	19+	12+	2.5	5.5	-	
744	21	21	2	light to medium gray-brown chert with yellow streaks	base	14+	12+	2.5	6	-	
758	22	21	6	dark gray chert	base	7+	12+	2.5+	5	-	base only
765	20	12	4	Tecovas lookalike	near complete	22+	10+	3	4	-	finely serrated blade edges; same material as dart point 744 and projectile point preform 744
770	20	12	7	light to medium gray chert	near complete	21+	8+	2.5	4	0.4	
789	21	12	3	medium brown-gray chert	blade	12+	12+	3.5	7	-	
800	21	11	3	light gray chert	complete	26	15	2.5	6	0.9	finely flaked; not Edwards
818	21	10	4	light gray chert	blade	15+	11+	2.5+	5	-	extra notch; not Edwards
838	22	10	1	red and black chert	base	8+	13+	3+	6.5	-	variety of Tecovas?; basal notch
865	22	22	6	medium gray chert with brown streak	near complete	15+	10+	3	7.5	0.6	reworked blade
875	23	21	2	off-white chert	base	15+	11+	3	6	-	
892	23	23	4	medium to dark gray chert	base	8+	13+	2+	6.5	-	heat-treated
914	19	13	3	light gray chert	base	7+	12	3+	6	-	base only
962	20	15	3	light gray chalcedonic chert with orange	near complete	14+	14	3.5	6.5	0.8	heat-treated?; reworked blade?
995	18	14	1	possibly Edwards chert	complete	24	15	3.5	6.5	0.8	finely flaked

APPENDIX 5

LA 68182: Roughouts or Early-Stage Bifaces

Notes + indicates incomplete measurement because of breakage.

Complete Examples										
	Provenience					Dimensions (mm, g)				
	Meters									
FS No.	N	W	Level	Material	Part	Length	Width	Thick-ness	Weight	Remarks
7	10	14	surface	medium gray chert with orange specks	complete	27	18	7.5	3.5	heat-treated
37	12	22	surface	tan and light gray chert	complete	32	24	11	8.2	
86	16	16	surface	mottled tan and light gray chert	complete	37	19	9.5	6.5	
196	24	28	surface	tan chert	complete	30	20	8	4.6	
211	26	6	surface	light to medium gray chert	complete	37	20	14	7.5	possibly heat-treated
230	26	44	surface	light to medium gray chert	complete	35	20	11	6.3	
232	26	48	surface	off-white to gray-brown chert	complete	33	21	9	6.8	
247	28	26	surface	amygdaloidal basalt	complete	31	19	6	4	
325	34	22	surface	fingerprint chert	complete	28	19	8	3.6	
451	20	21	1	fingerprint chert	complete	49	31	10.5	17.4	possibly heat-treated
455b	24	25	1	red chert	complete	20	17	7	2.5	mostly unifacial
456a	24	25	2	fingerprint chert	complete	28	22	9	5	
456d	24	25	2	light to medium gray-brown chert	complete	24	17	6	2.6	retains flake characteristics
472	22	12	1	dark gray chert with white accents	complete	30	17	10	5.7	not Edwards chert
715	20	13	1	medium gray and gray-brown chert	complete	36	25	8	7.9	finely chipped; made on flake?
774	20	11	1	mottled off-white, light and medium gray chert	complete	40	24	10	9.5	
784	20	11	7	medium gray-brown chert	complete	32	25	7.5	6.1	finely chipped
828a	21	9	2	tan to light gray limey chert	complete	44	24	11	10.2	
828b	21	9	1	purple quartzite	complete	27	19	9	4.4	
840a	22	10	2	fingerprint chert	complete	34	25	11	8.2	heat-treated

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Complete Examples										
	Provenience					Dimensions (mm, g)				
	Meters									
FS No.	N	W	Level	Material	Part	Length	Width	Thick-ness	Weight	Remarks
890	23	23	2	mottled tan and gray chert	complete	40	37	13	23	burned/heat-treated
900	24	22	1	medium gray-brown chert	complete	35	28	10	11	
905	24	22	5	light, medium, and dark gray chert	complete	35	23	10	6.5	heat-treated
908	19	14	3	gray-maroon chert	complete	32	13	8	3.5	finely chipped
913	19	13	1	dark mauve-brown-gray chalcedonic chert	complete	25	26	14	7.3	major thinning problems
914a	19	13	3	light gray chert	complete	35	31	10	10.7	probably heat-treated; irregular flake
914b	19	13	3	mottled light and medium gray chert	complete	35	20	12	8.6	one lateral edge, pebble exterior
919a	21	6	1	tan and light to medium gray chert	complete	34	22	7	6.6	
919b	21	6	1	striped light and dark gray chert with orange speckles	complete	30	31	8	5.1	heat-treated
924	23	5	1	light and medium gray chert	complete	38	24	10	8.6	
942	21	17	5	mottled light and medium gray chert	complete	33	27	12	9.9	heat-treated
960a	20	15	1	mottled light and medium gray chert	complete	37	23	12	10.4	
961a	20	15	2	mottled light and medium gray chert	complete	30	27	13	10.1	heat-treated
961b	20	15	2	mottled light-medium gray chert with orange specks	complete	33	20	8	4.4	probably heat-treated
963a	20	15	3	tan to light to medium orange chert	complete	29	17	8	2.8	probably heat-treated
963b	20	15	4	mottled dark gray chert	complete	37	27	13	12.3	heat-treated; thinning problems
965	20	15	5	mottled light and medium gray chert	complete	39	24	12	10.3	
973a	19	16	1	medium gray-brown and mauve chert	complete	32	22	7	5.6	possibly heat-treated
1006	24	26	1	fingerprint chert	complete	43	27	12	11	

Fragmentary Examples											
	Provenience					Dimensions (mm, g)				
	Meters				Part			Thick-		
FS No.	N	W	Level	Material	Fragment	Length	Width	ness	Weight	Remarks
427e	20	14	5	rose and white chalcedony	base	18+	22	11	-	not Alibates material
439a	24	13	1	mottled light, medium, dark gray chert	tip	39+	27+	10+	-	heat-treated or burned
439b	24	13	1	mottled light, medium, dark gray chert	base	22+	22	7+	-	heat-treated
455a	24	25	1	fingerprint chert	tip	26+	20+	11+	-	heat-treated
456b	24	25	2	mottled medium gray chert	tip	27+	15+	11+	-	
456c	24	25	2	dark gray chert	tip	24+	15	11+	-	heat-treated
456e	24	25	2	“ghosty” medium gray chert	lateral edge	22+	20+	9+	-	“ghosty” effect from patination?
477	22	19	1	mottled light and medium gray chert	tip	27+	17+	10+	-	heat-treated
478	22	19	2	off-white, light and medium-gray chert	lateral edge	45+	17+	9+	-	possibly heat-treated
776	20	11	3	tan to light gray chert	lateral edge	30+	18+	8+	-	
826	21	9	1	mottled light and medium gray chert	base	17+	35+	9+	-	
840b	22	10	2	mottled light, medium, dark gray chert	base	23+	22+	7+	-	heat-treated
880	22	23	1	white and dark gray chert	base	25+	21+	6	3.5+	made on flake
891a	23	23	3	coarse fingerprint chert	base	15+	23+	8+	-	possibly heat-treated
891b	23	23	3	“ghosty” medium gray-brown chert	lateral edge?	30+	15+	9+	-	one face mostly cortex
891c	23	23	3	fingerprint chert	base	17+	24+	8+	-	
914c	19	13	3	white chalcedony	base	23+	20+	12+	-	
960b	21	15	1	mottled gray and orange chert	base	30+	21+	11+	-	
963c	20	15	4	possible Edwards chert	base	26+	29+	9+	-	warm UV response
973b	19	16	1	mottled light and medium brown-gray chert	base	15+	27+	8+	-	
974a	19	16	2	mottled light and dark gray-brown chert	tip	44+	29+	10+	-	
974b	19	16	2	mottled medium gray-brown and gray limey chert	tip	24+	20+	6+	-	heat-treated
1007	24	26	2	light and medium gray chert	base	17+	33+	7+	-	

APPENDIX 6

LA 68182: Preforms or Late-Stage Bifaces

Notes A specimen described as **near complete** is ≥ 95% complete.
+ indicates incomplete measurement because of breakage.

Complete Examples										
	Provenience					Dimensions (mm, g)				
	Meters									
FS No.	N	W	Level	Material	Part	Length	Width	Thick-ness	Weight	Remarks
61	14	18	surface	coarse light gray chert	complete?	23	15	4	1.2	
455	24	25	1	fossiliferous medium gray chert	complete	34	14	6	2.8	
744	21	21	2	Tecovas lookalike	complete	25	15	4.5	1.3	heat-treated; same material as dart point 744 and side-notched arrow point 765
851	22	9	1	mottled medium and dark gray chert	complete?	22	12	4	1.1	reworked dart-tip fragment?; unsuccessful
899	24	22	1	light to medium brown-gray and gray chert	complete	26	19	4.5	2.1	
900	24	22	1	light gray chert	complete	33	17	6	2.9	edge-trimmed flake
1054	19	12	?	Alibates	complete	24	11	2.5	0.9	

Fragmentary Examples										
	Provenience					Dimensions (mm, g)				
	Meters									
FS No.	N	W	Level	Material	Part Fragment	Length	Width	Thick-ness	Weight	Remarks
245	20	14	5	light gray and orange chert	near complete	20+	19	3.5	1.3+	probably heat-treated
475	22	16	1	coarse off-white chert	near complete	23+	14	4	1.4+	one notch; broken during notching
477	22	19	1	light gray and yellow chert	near complete	24	12+	2	0.4	broken during notching
774	20	11	1	light gray chalcedonic chert	near complete	19+	13+	3.5	0.9+	not Edwards chert
784	20	11	7	off-white chert with gray streaks	near complete	18+	16+	4	0.9+	possibly heat-treated
830	21	9	4	off-white chert	near complete	26+	15	5	2.0+	
265	30	10	surface	speckled red-gray chert	base	14+	11	3	0.6+	
427	20	14	5	coarse yellow chert	base	9+	13	2.5	0.4+	edge-trimmed flake
458	20	4	1	orange and light gray chalcedonic chert	base	15+	12	3	0.6+	probably heat-treated
479	22	19	3	light gray chert	base	18+	19	4	1.5+	edge-trimmed flake
716	20	13	1	medium gray chert	base	22+	15	4.5	1.5+	
786	20	11	9	medium gray and orange-gray chert	base	21+	14	3	0.8+	heat-treated
838	22	10	1	mottled light and medium gray chert	base	18+	22+	5	2.1+	edge-trimmed flake
840	22	10	1	light mauve chert	base	15+	12	2.5	0.6+	edge-trimmed flake
987	20	17	1	liver-colored fine quartzite	base	21+	20	5.5+	2.8+	
989	20	17	2	light gray-tan chert	base	13+	14+	3+	0.5+	
994	18	14	1	light orange chert	base	10+	12+	2.5+	0.4+	heat-treated
997a	18	14	3	orange-red chert	base	9+	14+	3.5+	0.3+	
426	20	14	4	dark gray-red chert	blade	23+	16+	4	1.4+	heat/frost-spalled
736	21	21	1	fine light gray chert	tip	13+	13+	3+	0.4+	edge-trimmed flake; heat-treated

APPENDIX 7

LA 68182: Miscellaneous Biface Fragments

Notes + indicates incomplete measurement because of breakage.

Miscellaneous Biface Fragments

	Provenience					Dimensions (mm)			
	Meters								
FS No.	N	W	Level	Part Fragment	Material	Length	Width	Thick-ness	Remarks
6	10	12	surface	base	dark gray chert	17+	17+	3.5+	preform?
427c	20	14	5	base	dark red chert	12+	16+	5+	heat-treated?
473	22	12	2	base	light orange chert	13+	15+	3.5+	preform?
836	21	9	8	base	light and medium gray chert	17+	22+	5+	heat-treated
901b	24	22	2	base	dark gray siltite	8+	15+	4+	-
907b	19	14	2	base	white and orange chalcedonic chert	13+	16+	5+	preform?; heat-treated
975	19	16	3	base	light, medium, dark gray chert	16+	19+	5+	probably heat-treated
1055	general surface			base	Alibates	14+	19+	5+	preform?; heat-treated?
254	24	40	surface	blade	tan chert	16+	12+	2.5+	preform?
421	20	14	1	blade	light and dark orange chert	23+	10+	3+	arrow?
427b	20	14	5	blade	mottled medium gray chert	30+	23+	6+	dart preform?
745b	21	21	3	blade	medium and dark gray chert	20+	13	5	preform?
786	20	11	9	blade	light and medium gray chert	19+	17+	3+	preform?
840	22	10	2	blade	light and dark gray chert	20+	12+	4+	preform?
991	20	17	4	blade	light-medium gray chalcedonic chert	9+	7+	4+	dart?
319	34	8	surface	mid-blade	light orange and medium gray chert	16+	13+	3.5+	arrow?; heat-treated?
456f	24	25	2	mid-blade	medium gray and red chert	10+	8+	2.5+	arrow?; heat-treated
459	20	4	2	mid-blade	off-white chert	14+	10+	2.5+	arrow?
472	22	12	1	mid-blade	dark gray chert	15+	20+	7+	dart?
656	6	32	surface	mid-blade	light and medium gray chert	16+	20+	5+	dart?
764b	20	12	4	mid-blade	light and medium gray chert	13+	12+	2.5+	arrow?
828	21	9	2	mid-blade	medium and dark gray chert	16+	10+	3+	arrow?
864	22	22	5	mid-blade	light brown and dark gray-brown chert	15+	11+	2.5+	arrow?; heat-treated
896	23	23	6	mid-blade	light gray chert	7+	9+	4+	arrow
899	24	22	1	mid-blade	medium gray chert	15+	19+	4+	preform?
913	19	13	2	mid-blade	medium gray chert chert	17+	19+	5+	dart?
914	19	13	3	mid-blade	tan chert	15+	24+	7+	dart?
961	20	15	2	mid-blade	light and dark orange chert	19+	22+	5+	dart?; heat-treated
985	20	16	4	mid-blade	light gray-brown chert	18+	9+	4+	arrow?
990a	20	17	3	mid-blade	tan chert	21+	19+	4+	dart?
994b	18	14	1	mid-blade	medium gray chert	14+	11+	3+	arrow?
997b	18	14	3	mid-blade	coarse medium gray chert	18+	14+	4.5+	preform?

continued on next page »

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Miscellaneous Biface Fragments

FS No.	Provenience Meters N	W	Level	Part Fragment	Material	Dimensions (mm) Length	Width	Thick-ness	Remarks
1020a	23	24	3	mid-blade	medium gray chert	15+	11+	5+	arrow?
1020b	23	24	3	mid-blade	light gray-tan chert	10+	9+	3.5+	arrow?
423a	20	14	2	lateral edge	light to medium gray chert	11+	10+	5+	heat-treated?
468	24	3	3	lateral edge	mottled medium gray chert	16+	8+	4+	-
775	20	11	2	lateral edge	white and red chalcedony	9+	7+	2+	preform?; heat-treated?
835	21	9	7	lateral edge	mottled light and dark gray chert	8+	18+	6+	burned
960	20	15	1	lateral edge	light and dark gray chert	14+	8+	3+	arrow; heat-treated
990b	20	17	3	lateral edge	speckled medium and dark gray chert	17+	7+	3+	dart “ear”?
1039	22	11	2	lateral edge	cloudy, light gray obsidian	20+	11+	4+	dart?
209	26	2	surface	tip	dark gray chert	12+	8+	2+	arrow?
300	32	24	surface	tip	light tan-gray chert	11+	13+	3.5+	preform?
316	34	4	surface	tip	light gray-orange chert	16+	14+	5+	preform?
320	34	12	surface	tip	mottled medium gray and brown chert	10+	10+	2.5+	preform?
421	20	14	1	tip	light brown-gray chert	19+	15+	3+	roughout?
423b	20	14	2	tip	medium and dark gray chert	14+	15+	4+	dart?
424	20	14	3	tip	medium brown-gray chert	15+	13+	3.5+	preform?
438	24	7	1	tip	light gray chert	17+	13+	4+	dart?
443	24	20	2	tip	light to dark brown chert	12+	15+	5+	heat-treated?
455c	24	25	1	tip	mottled light-medium gray chert	8+	10+	3+	-
456e	24	25	2	tip	light gray chert	19+	9+	3+	dart?
475a	22	16	1	tip	light gray chert	20+	10+	2.5+	arrow?
475b	22	16	1	tip	dark gray chert	12+	8+	3.5+	arrow?
478	22	19	2	tip	siltite	21+	23+	5+	indeterminate color
546	50	10	surface	tip	hazy chalcedony	14+	13+	4+	dart?
699	52	84	surface	tip	medium gray chert	13+	10+	3.5+	preform?; heat-treated?
736	21	21	1	tip	dark gray chert	12+	14+	2.5+	preform?
745a	21	21	3	tip	tan chert	14+	6+	2.5+	arrow?; heat-treated?
746	21	21	4	tip	light and medium gray chert	16+	9+	3+	preform?
764a	20	12	4	tip	dark brown and red chert	12+	8+	2+	arrow; heat-treated?
776	20	11	3	tip	medium gray and orange siltite	22+	20+	5+	roughout?
838	22	10	1	tip	tan to medium gray chert	11+	10+	3+	arrow?
862	22	22	3	tip	light brown and dark gray chert	18+	10+	2.5+	arrow?
870	23	22	4	tip	light gray chert	12+	7+	2.5+	arrow?
884	22	23	3	tip	Alibates	20+	16+	4+	dart?
907a	19	14	2	tip	light brown-gray chert	15+	11+	2+	preform?
914	19	13	3	tip	tan chert	13+	11+	4+	dart?
965	20	15	5	tip	Alibates looklike	8+	7+	3+	preform?
982	20	16	2	tip	medium and dark gray chert	21+	20+	5+	preform?
994a	18	14	1	tip	medium gray and red chalcedony	15+	9+	3+	arrow?
996	18	14	2	tip	dark brown chert	13+	14+	6.5	preform.; heat-treated
455d	24	25	1	?	medium gray chert with profuse white specks	12+	9+	3+	-
901a	24	22	2	?	medium gray-brown chert wit white specks	22+	15+	5+	dart?

APPENDIX 8

Definitions of Chipped Stone Debitage Terms

Material Types

A bewildering variety of material types, colors, and color combinations occur in the lithic material of most prehistoric sites in southeastern New Mexico. In an attempt to do justice to the situation, the author and Byron T. Hamilton have devised a chipped lithic material code of nearly 100 varieties. Because this amount of detail is too great to present in reports, a standardized presentation of six groups is used: local gray cherts, other cherts, chalcedonies, limestones, siltites and quartzites, and other materials. Readers desiring more details of the lithic material varieties at specific sites should contact the author.

Gray cherts. A variety of gray cherts suitable for knapping are available in the Roswell region. The raw material units are commonly found as concretions or nodules up to 10 or 15 cm long, eroding out of San Andres limestone in the hill country west of Roswell (Hannaford 1981; Phillips et al. 1981).

Colors include off-white, various shades of gray and brownish gray, and black; the gray and brownish gray shades are the most common. Individual pieces frequently possess two or more shades or colors; the transitions from one shade to the other may be gradual or they may be abrupt, as in striping or mottling. Numerous pieces of off-white and gray (or light gray and dark gray) striped material, sometimes referred to as "fingerprint" or "zebra" chert, were noted in the collections. The author has seen these materials among those found eroding out of the San Andres limestone. Eighteen sorting varieties were tabulated during the analysis, though all were pooled for presentation here.

Variable percentages of knapping debris show the effects of heat treatment. Dr. Phillip Shelly recently informed the author that the gray cherts showing different degrees of orange coloration indicate intentional heating, probably to improve the knapping quality of the pieces. These pieces also have a good luster equal to or better than that normally seen in untreated (e.g., strictly gray) examples.

The knapping quality of the local gray cherts varies from grainy (transitional to a siltite) to fine cryptocrystalline. Perhaps the greatest problems to knappers are the small sizes and the internal fractures and textural irregularities common to a large percentage of the nodules.

Other cherts. This residual category includes 20 varieties of cherts that probably belong to the local gray category, as well as some that evidently derive from other sources. The former group includes grainy cherts or siliceous siltstones which embody many of the colors and color combinations of the local gray cherts described above. The grainy structure of these cherts requires greater strength and therefore imposes greater difficulty for knapping. These materials comprise the majority of the "other chert" category.

A few cherts of radically different colors, which do not derive from the same sources as the gray cherts, include dark red and black jasper, white and brown chalcedonic chert, tan chert, medium brown chert, dark brown chert, and medium brown chert with black speckles. All of these cherts have a fine cryptocrystalline structure which enhances their knapping utility. However, the author suspects that the raw material units for these materials are generally small (i.e., 10 cm or less in maximum dimensions), and some are obviously riddled with internal fractures and other flaws which make knapping difficult. These cherts occur in low frequencies in regional assemblages.

The Pecos River gravels are the suspected source of most of these cherts. However, a local collector once told the author that the Cedar Hills area 10 to 15 km north of the project area is a possible source of tan chert. It is also interesting to note that many tan chert flakes and artifacts, if they have fresh breaks on them, are light to medium gray inside. Because it is obvious that not all gray chert patinates in this manner, a separate source for these "tan" cherts is virtually certain.

The red and black jasper or chert may also be from a source other than the Pecos River gravels. The author, during field work at the Harrison-Greenbelt site in the Panhandle of Texas (Donley County), noted a high frequency of red and black chert, which he was told is a variety of Tecovas chert.

Chalcedonies. These slightly to greatly translucent cryptocrystalline materials include 17 sorting varieties with gray and brownish gray colors. The colors of most pieces are the same as the local gray cherts, including a "fingerprint" variant; a San Andres limestone origin for these materials seems likely.

Two varieties of chalcedony which probably do not derive from the local San Andres are clearish white with traces of brown, and red and light gray with profuse red. The Pecos River gravels are the suspected source of these uncommon material types.

Limestones. Limestones and associated sedimentary rocks (dolomites, sandstones, etc.) belonging to the San Andres formation (Permian) constitute the singly largest geologic surface outcrop in southeastern New Mexico. During prehistory, these rocks, some of them indurated with silica, were used for both chipped stone and ground stone artifacts.

Quartzites, fine quartzites, and siltites. Siltites, or silicified siltstones, are a common component of the San Andres formation in the project area. Not surprisingly, flakes of this material were frequently found in the cultural assemblages as well. Grain sizes include true siltstones and mudstones. Both light gray and light brown colors are represented. A slight brownish cast was occasionally observed in these materials in the rock outcrops in the Hondo Valley, indicating that some of the coloring is natural. However, the frequent occurrence of light brown examples among the debitage in the sites also suggests some of the specimens may have been heat-treated in an attempt to make them more knappable. Clearly, a specially designed study will be necessary before the matter is resolved.

Both fine- and coarse-grained quartzites in several colors were recorded. The fine light gray and light brown quartzites are probably related to the siltite described above and therefore are probably of local origin. Several flakes of a fine white quartzite are probably burned examples of these materials. Varieties of quartzites that are not immediately available in the vicinity of the sites include a true off-white variety, brown and gray, a fine medium brown and dark gray (not the same as the previous brown and gray variety), dark gray-green, orange-red to orange (burned?), and dark purple. The Pecos River gravels may be the source of some or all of these materials.

Other materials. Several lithic materials are easily recognized as deriving from distant sources. All examples are few in number; they include Alibates material (both orange-red and purple varieties), Tecovas or Quitaque chert, Edwards chert, clear obsidian, and a calcrete composed of opalized white chert (gravels and small pebbles) cemented by caliche. The possible Tecovas examples are mostly purple with spots of red and yellow.

The source or sources of the LA 68182 obsidians have not been demonstrated through chemical studies. However, clear obsidians are documented in Las Cruces area Rio Grande gravels in south-central New Mexico and on the eastern side of the Jemez Mountains of north-central New Mexico. The hazy gray obsidian from LA 68182 has finer ash particles (causing the gray color) and a lower concentration of particles, which are more characteristic of a source on the east side of the Jemez Mountains, rather than Polvadera Obsidian from the northwest side of the same range.

Alibates material, a silicified dolomite, comes from the famous quarries in the Canadian River Valley north of Amarillo, Texas. Several similar materials, called Alibates lookalikes, have been documented for the Canadian River Valley and nearby Llano Estacado (High Plains) Caprock near the towns and map-spots of Tucumcari, Ragland, and Yeso in east-central New Mexico, and Baldy Peak on the Colorado/New Mexico line east of Raton, New Mexico. Tecovas, or Quitaque comes from one or both sources in the Texas Panhandle, one being in the Canadian River Valley west of the Alibates quarries and the other being along the eastern Caprock east of Plainview, Texas.

Edwards chert comes from a vast area in central and west-central Texas. The closest known sources to New Mexico are in the vicinities of Big Spring and Abilene, Texas.

Core Types

The terms for the types of cores are mostly self-explanatory, but three of them—2-platforms-adjacent, 2-platforms-parallel, and flake—require a some elaboration. In the remarks below, the word "face" refers to the surface from which flakes actually detach. Thus, the hammer strikes the platform and the flake removes from the core face.

2-platforms-adjacent cores. The striking platforms of 2-platforms-adjacent cores share a common edge and form an angle between them. That angle is usually about 90 degrees, but it may also be as much as 140 or 150 degrees.

2-platforms-parallel cores. The striking platforms of 2-platforms-parallel cores do not share a common edge. The platforms are roughly parallel to one another because the opposing flat sides of a cobble or pebble are used as the platforms. However, the degree of parallelism can vary widely. Flakes struck from the two platforms may be removed from different faces or from the same face of the core.

Flake cores. Flake cores are large flakes used as sources of flakes. Usually the ventral surface of the original flake was used as the striking platform, and flakes were removed from the dorsal surface. The patterning and nature of the flake scars leave little doubt that these are *not* unifacial artifacts, but rather are cores.

Flake Types

Biface-notching flakes. These distinctive, small flakes have the U-shaped platforms characteristic of flakes removed during the notching of bifaces for hafting (Austin 1986).

Biface-thinning flakes. Flakes classified as biface-thinning flakes are probably mostly flakes produced by pressure and baton techniques. These flakes tend to be thin, are strongly curved (and frequently twisted) along the length axis, and have decidedly acute platform/ventral surface angles. These flakes also frequently have one or more flake scars on the dorsal surface at the distal end which were removed from the opposite direction.

Core-reduction flakes. Core-reduction flakes comprise the majority of any chipped stone debitage assemblage. Flakes removed in order to trim the core (after initial decortication), to shape the core, to obtain flakes suitable for making formal artifacts, and flakes which fail to meet the requirements for making formal artifacts are all included in this category.

Decortication flakes and platform-preparation flakes. Decortication flakes and platform-preparation flakes are very similar in some respects. Both have large amounts of cortex on the dorsal surface. The primary difference is thickness—decortication flakes are relatively thick, and platform-preparation flakes are very thin. The distinction between thick and thin is judgmental and therefore of questionable value, but it seems to convey a difference in attitude. The thicker or decortication flakes suggest an absence of concern for conserving material. The thinner or platform preparation flakes suggest just the opposite—remove cortex to prepare a good striking surface, but do not remove any more material than is absolutely necessary.

Hammerstone flakes. Hammerstone flakes were removed from hammerstones during pounding activities. They have one or more ridges or high points on the dorsal surfaces, which were heavily blunted from hard pounding. Although it is not necessarily the case, most hammerstone flakes are believed to be unintentional.

Platform-edge rejuvenation flakes. Platform-edge rejuvenation flakes were removed from cores in order to overcome a series of step fractures and other failures which were preventing successful flake detachment. Two general approaches were used. One was to strike the corrective flake from further back on the platform but in the same direction as regular flake removal. The other approach was to strike the rejuvenation flake from one side of the platform edge. Either way, the resulting flake has a distinctive triangular cross-section with a smooth surface below one side of the apex and multiple step fracture scars on the other. The apex on the rejuvenation flake removed from further back on the platform is perpendicular to the long axis of the flake. That of the flake removed from the side of the core is parallel to the long axis (i.e., forms a prominent spine down the dorsal surface).

Platform Types

Most of the terms for the platforms are generally self-explanatory, though a few remarks are appropriate for some of them.

Multiple-flake-scar (MFS) platforms. These differ from Old World faceted platforms in several important ways. MFS platforms simply have two or more scars of previously removed flakes on them. Although the flake scars may have been the result of core-platform preparation (i.e., removal of cortex to improve flake production), the procedure was to remove the cortex from the platform of the core in an expedient manner and without any intention other than to remove that cortex. To this end, the decortication flakes may have been removed from any convenient direction on the core. Thus, reduction flakes from these cores can have flake scars which obviously emanated from more than one direction.

A faceted platform, the term used by Old World lithic technologists, involves more than simple decortication. A series of small flakes was sequentially removed from the same edge of the core, resulting in parallel flake scars and flake scar ridges. Moreover, the flake removal is done in such a way that a convex platform, rather than a flat one, is created. This convex surface permitted easier isolation of an aiming point for flake detachment and therefore greater control over the final product. The author's experience with Southwestern lithic assemblages, particularly those from the pottery periods, is that true faceted platforms are rarely found. However, the fact that they do exist indicates that this sophisticated technique was known to prehistoric knappers even though it was not widely used.

Pseudodihedral platforms. The term pseudodihedral is modified from the Old World concept of dihedral platforms. The dihedral method involved the removal of two series of flakes, one down each side of the core. The distal end of one row of flakes intersected that of the other row, resulting in a single, tent-like ridge down the center of the core platform. This ridge was then used as the aiming point for sequential flake detachment. It permitted easier isolation of the aiming point and therefore greater control over the final product. Flake platforms produced by the dihedral technique display two flake scars ending in a central peak. The flake scars display ripples and other landmarks indicating removal from opposite directions.

In Southwestern assemblages, true dihedral platforms are rare, but prehistoric knappers employed a similar (or "pseudo") approach. They frequently aimed their hammers at ridges between adjacent flake scars, or at edges between flake scars and cortex, or at the edge of a core platform. Such aiming points had the same effect as the dihedral ridge—limiting the place where the blow could land, thereby creating greater control over the size and shape of the new flake. The resulting flake platforms have a peak between two flake scars or between a flake scar and cortex.

Distal Termination Types

Modified-feathered termination. Only one distal termination type, the modified-feathered, needs explanation. This type of termination occurred when the flake was so thick that a portion of the opposite side of the core was carried away with the flake, resulting in a blunt distal edge.

Shatter

Shatter is any piece of material derived from the knapping process which cannot be classified as a core or flake. In general, shatter results from uncontrolled breakage of the core, usually because of naturally occurring internal fractures or other inconsistencies in the material.

Pieces of Material

This category refers to chunks of knappable material brought into the site by the occupants. However, for reasons unknown, they were not knapped or otherwise intentionally fractured.

Use-Wear on Debitage

The unifacial and bifacial types of edge-wear are found on several kinds of edge configurations which might reflect function; these configurations, as seen from either the dorsal or the ventral surfaces of the flakes, are straight, convex, concave, sinuous, irregular, and projections. The distinction between use-wear on concave edges and notches can be somewhat arbitrary in some instances. For the most part, notches have small diameters and configurations that set them apart from the remainder of the edges on which they are located.

Two basic types of use-wear are represented: marginal unifacial wear and marginal bifacial wear. Very conservative criteria were used in deciding whether edge damage is attributable to use-wear. Generally speaking, a number of contiguous scars had to be present for a given manifestation to be designated use-wear. In a number of instances, the flake scars were sufficiently long and regular in shape that they may have been the product of minute intentional retouch. These examples are recorded as intentional retouch.

Flakes bearing evidence of use-wear or intentional retouch, or both, are described both as pieces of manufacture debris and as flake tools. As such, they are described and otherwise taken into account in both the manufacture debris and tool sections of this report.

APPENDIX 9

LA 68182: Preliminary Mussel Identifications (Umbo Sections Only)

Cyrtonaias tampicoensis					
	Provenience				
	Meters				
FS No.	N	W	Level	Side	Remarks
440	24	13	2	left	mature
718	20	13	5	right	
734	20	13	4	left	mature
734	20	13	4	left	
760	20	12	1	left	
760	20	12	1	right	mature; tool
764	20	12	4	left	
781	20	11	7	left	very small animal
781	20	11	7	left	larger than above, but still relatively small
786	20	11	9	right	
799	21	11	3	left	
819	21	10	5	right	
828	21	9	2	left	younger animal
828	21	9	2	right	older animal
830	21	9	4	right	31 mm from umbo to opposite edge
831	21	9	5	left	
869	23	22	3	left	mature
906				right	mature; tool
911	19	13	1	right	
911	19	13	1	left	
914	19	13	3	left	mature
969	19	15	3	left	identification tentative as to species
976				right	mature; tool
982	20	16	2	left	
985	20	16	4	left	
985	20	16	4	right	
989	20	17	2	right	
1002	24	21	3	right	mature

					Popenaias popeii
	Provenience				
	Meters				
FS No.	N	W	Level	Side	Remarks
427	20	14	5	left	small animal
427	20	14	5	left	
459	20	4	2	left	mature
717	20	13	4	right	very small animal
717	20	13	4	right	
718	20	13	5	right	
722	20	13	6	left	
734	20	13	*	left	26 mm from umbo to opposite edge; * from burial pit fill
762	20	12	3	right	mature
766	20	12	5	right	
772	20	12	8	left	very small animal
774	20	11	1	left	probably same animal as below
774	20	11	1	right	probably same animal as above
778	20	11	4	right	
788	21	12	2	left	
799	21	11	3	right	mature; 31 mm from umbo to opposite edge
810	20	10	5	left	mature
816	21	10	2	?	
817	21	10	3	right	multitoothed (4)
831	21	9	5	left	
850	22	9	2	right	small animal
850	22	9	2	left	larger animal
895	23	23	5	right	mature
906	19	14	2	left	
962	20	15	3	right	
962	20	15	3	right	
969	19	15	3	left	30 mm from umbo to opposite edge
969	19	15	3	left	28 mm from umbo to opposite edge
969	19	15	3	right	about 27 mm from umbo to opposite edge
969	19	15	3	right	
971	19	15	4	left	23 mm from umbo to opposite edge
972	19	15	5	left	half the size of type specimen; shell formation problems (metcalf 1982)
985	20	16	4	left	
986	20	16	5	right	
990	20	17	3	right	probably same animal as below
990	20	17	3	left	probably same animal as above
992	20	17	5	left	
1002	24	21	3	left	