# Archaeological Research During 2018 at the La Botica Site, Conejos County, Colorado

Mark D. Mitchell

Research Contribution 114
Archaeological Investigations in the San Luis Valley 6

PCRG
PaleoCultural Research Group

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## Abstract

The La Botica site (5CN1061) is a large and complex archaeological locality on a high strath terrace in the middle reach of the La Jara Canyon in central Conejos County, Colorado. The site preserves a unique record of Native American lifeways spanning at least 8,000 years. The site is also important for the San Luis Valley's Hispano residents, who gathered medicinal plants there in the nineteenth and twentieth centuries.

To learn more about the La Botica's history of occupation and about the processes affecting the archaeological deposits preserved there, Paleocultural Research Group (PCRG), a nonprofit research and education organization, carried out a nine-day archaeological field investigation at the site in 2018. A total of 20 people—including ten citizen-science volunteers—participated in the project. Tasks completed during the fieldwork included an intensive surface inventory, an artifact density survey, culturally modified tree documentation, and limited subsurface testing.

Archaeological materials at the site are entrained in late Pleistocene and Holocene sediment. Multiple episodes of deposition and erosion were identified during the fieldwork. Much of the site's surface has been scoured by sheetwash during the last millennium and erosion is ongoing in portions of the site.

Indigenous occupation of La Botica began during the Early Archaic and continued intermittently into the nineteenth century. The primary focus of the site's Native American inhabitants was plant processing, along with a secondary focus on tool kit refurbishment and late-stage tool production. Different portions of the site were occupied during different periods: Archaic-stage occupancy took place across the site, but the Late Prehistoric occupants focused their activities on the site's southern perimeter. Although the cultural identities of La Botica's Archaic-stage occupants are not known, the site's Late Prehistoric visitors included Plains and Pueblo peoples, as well as groups living primarily in the Southern Rockies.

Brief occupation by local San Luis Valley residents occurred during the early twentieth century. However, the recent historic artifact assemblage is too small to draw specific functional interpretations.

La Botica is listed on the State Register of Historic Properties and is eligible for the National Register of Historic Places. Although much of the site's surface has been altered by erosion, it is likely that intact cultural deposits occur within the site boundary. La Botica therefore retains the capacity of provide additional important information about the cultural and economic history of the Rio Grande basin.

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## Acknowledgments

Like most field sciences, the success of archaeological research depends on getting the right people to the right places at the right time with the right equipment. The logistics of the large La Botica field camp proved to be especially complex and numerous individuals and organizations contributed to its smooth functioning. Bureau of Land Management archaeologist Marvin Goad assisted with initial scouting for the camp location and provided critical information about site access. PCRG is grateful to the State Land Board and Colorado Parks and Wildlife for permission to establish the camp on state land that ordinarily is closed. PCRG member and Forest Service archaeologist Angie Krall and her husband (and recovering archaeologist) John Evaskovich assisted with pre-field coordination and delivered a 500-gallon water tank to the camp—under conditions that proved to be challenging. The tank was loaned to the project by the Rio Grande National Forest and the trailer on which it was mounted was loaned by project participant and Adams State University anthropology student Jordyn Neely. PCRG is grateful to Brandt's Septic for going above and beyond in the service of science.

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PCRG's citizen-science projects would not be possible without the dedication of our many member volunteers. A list of the people who participated—many of them professional archaeologists—is provided in chapter 2. PCRG is indebted to everyone who participated.

Major funding for the project was provided by a History Colorado – State Historical Fund grant (No. 2018-02-039). Supplemental funding was provided by the Sangre de Cristo National Heritage Area, the Colorado State Land Board, and Colorado Parks and Wildlife. PCRG is especially grateful to the State Historical Fund and the Sangre de Cristo National Heritage Area for their ongoing support for public archaeology in southern Colorado.

## About the Author

**Dr. Mark D. Mitchell** is the Research Director for Paleocultural Research Group. His research explores the archaeology of two different regions: the Northern Plains in western North Dakota, and the Southern Rocky Mountains in Colorado and New Mexico. Mitchell's Southern Rockies research focuses on American Indian mobility and land use in the San Luis Valley and adjacent mountains. He is particularly interested in how technological and environmental change affected native peoples' economic decisions. Mitchell's Northern Plains research focuses on the political and economic development of post-A.D. 1200 farming villages of the Missouri River valley. He also studies historic American Indian rock art and the history of archaeology. Mitchell's research has appeared in *Plains Anthropologist*, *Antiquity*, *American Antiquity*, *Southwestern Lore*, *Colorado Archaeology*, *Quaternary International*, *Reviews in Colorado Archaeology*, and in more than a dozen book chapters. He is the author of *Crafting History in the Northern Plains: A Political Economy of the Heart River Region, 1400-1750* (University of Arizona Press, 2013) and co-editor of *Across A Great Divide: Continuity and Change in Native North American Societies, 1400-1900* (University of Arizona Press, 2010).

# 1 Introduction

This report describes an archaeological field investigation conducted during 2018 at the La Botica site (5CN1061), a large and complex archaeological locality that preserves a unique record of Native American lifeways spanning at least 8,000 years. The site is also important for the San Luis Valley's Hispano residents, who gathered medicinal plants there in the nineteenth and twentieth centuries. The demonstrated time depth of the site's occupation, combined with its unique botanical inventory and biogeographical setting, make it one of the most important archaeological sites in the region. For these reasons, La Botica—a Spanish term for "the Pharmacy"—is listed on the State Register of Historic Properties (SRHP) as a contributing resource to the La Jara Archaeological District (5CN1418) and is officially eligible for the National Register of Historic Places (NRHP) under criteria A and D.

The field investigation was undertaken by Paleocultural Research Group (PCRG), a nonprofit organization that conducts research, trains students, and educates the public in Plains and Rocky Mountains archaeology. Major funding for the project was provided by a grant awarded to PCRG by History Colorado's State Historical Fund (No. 2018-02-039). Supplemental funding was provided by the Sangre de Cristo National Heritage Area, the Colorado State Land Board (SLB), and Colorado Parks and Wildlife (CPW). The SLB and CPW, both divisions of the Colorado Department of Natural Resources, jointly own and manage the site. The archaeological fieldwork was conducted under a State of Colorado Archaeological Permit issued to PCRG (No. 74151).

The overall goals of the project were to obtain archaeological data on the site's history of occupation, on the processes affecting its archaeological deposits, and on its current condition. To address these topics, PCRG carried

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out systematic surface inventories to collect data on the density and types of artifacts present and excavated a small number of test units to collect data on soil stratigraphy and cultural features.

This chapter presents contextual environmental and archaeological data for the San Luis Valley and adjacent areas. Chapter 2 describes the results of the field investigation. Chapter 3 summarizes the project's results and offers recommendations for future work at the site and in the region.

## Project Area and Description of the La Botica Site

La Botica is located on a high strath terrace in the middle reach of the La Jara Canyon in central Conejos County, Colorado (figures 1.1 and 1.2). Covering roughly 15 ha (37 acres), the site completely encompasses the surface of the terrace remnant, which is perched some 110 m below the canyon rim and 85 m above the floodplain of the creek (figure 1.3). The east and south sides of the site are bounded by active blockfields. The north and west sides are defined by the valley-side margin of the terrace.

Apart from a small portion of the site's western end, the upper surface of the terrace has no modern hydrologic connection to La Jara Creek; precipitation that falls on the terrace drains toward the central depression where it infiltrates or evaporates. Fine-grained sediment accumulated on the terrace during the late Pleistocene and early Holocene and a buried soil dated to the early Holocene is preserved in sediment accumulated in the central depression. During at least the last millennium, sheetwash erosion has transported sediment from much of the site's surface into the central basin.

Artifacts observed at La Botica include ground stone tool fragments, projectile point fragments, other stone tools, flaking debris, and pottery sherds. Artifacts are unevenly distributed within the site: concentrations occur primarily north of the central depression and along the toe of the blockfield. Apart from projectile points, patterned chipped stone tools such as scrapers, drills, and bifacial cutting tools are uncommon. Chipped stone cores also are uncommon, suggesting that much of the flaking debris represents tool maintenance rather than primary tool production.

Diagnostic artifacts and features observed on site include a wide variety of projectile point forms, pottery sherds representing multiple types, and native-peeled ponderosa pines. Based on these materials, the indigenous occupation of the site spans much of the Holocene, from roughly 8000 B.P. (indicated by the base of a Jay-style projectile point) to 150 B.P. (indicated by the peeled ponderosa pines). The most intensive period of use likely occurred during the Archaic stage, although Late Prehistoric artifacts also are well represented. The number of Native American components or occupations is not known but almost certainly is large.

Recent metal artifacts also occur at the site, indicating at least limited occupancy during the late nineteenth or twentieth centuries.

## History of Research and Existing Data

La Botica was first recognized as a medicinal plant gathering locality more than 30 years ago, when a preliminary botanical survey was conducted (Bye and Linares 1986). However, the site's archaeological significance has only recently been recognized. A portion of the site was documented during an inventory undertaken for the Baca Land Exchange between the Bureau of Land Management and the Colorado State Land Board (Engineering-Environmental Management, Inc. 2009; Wells 2008). Additional reconnaissance work was subsequently accomplished by Fort Lewis College (Crosser *et al.* 2009). Additional site data are presented in a treatment plan for sites eligible to the National Register of Historic Places (NRHP) that were transferred to the State Land Board (Bevilacqua 2009a), and in the State Register of Historic Properties (SRHP) nomination for the La Jara Archaeological District (Bevilacqua 2009b). A cultural resources management plan for the transferred sites, including La Botica, stipulates a set of management goals and monitoring protocols (Mitchell 2020).

## Environmental Context

The San Luis Valley is the largest of the basins making up the Rio Grande Rift, a tectonic depression extending from southern Wyoming, through central Colorado, into the state of Chihuahua, Mexico (Chapin 1979; Kellogg *et al.* 2017). At broad structural scale, the San Luis Valley is a tilted half-graben, bracketed on the east by major faults along the foot of the Sangre de Cristo Mountains and on the west by a broad hinge east of the San Juan Mountains (McCalpin 1996).

Geologists commonly partition the San Luis Valley into four or five physiographic subregions (McCalpin

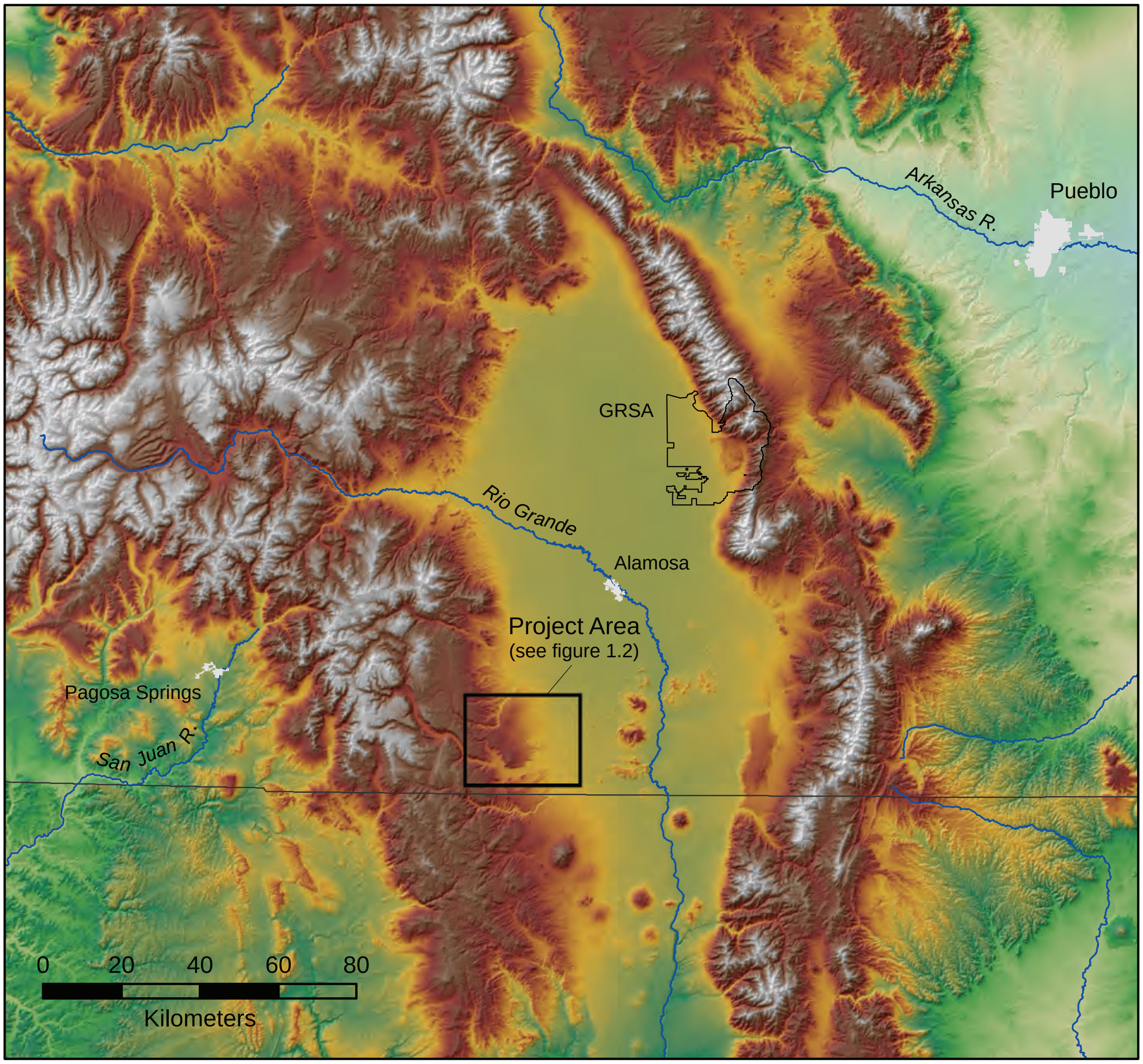



*Figure 1.1. Map of the San Luis Valley showing major rivers and cities and the boundary of Great Sand Dunes National Park (GRSA). The project area is enlarged in figure 1.2.*

1996; Upson 1971). The largest of the subregions is the Alamosa Basin, which encompasses the internally drained (Closed Basin) northern portion of the valley, as well as the broad alluvial fan of the Rio Grande. The southern portion of the valley is partitioned into the Culebra Reentrant, the Costilla Plains, and the Taos Plateau. Some authors also isolate the San Luis Hills, a series of rugged mesas and buttes located between the Alamosa Basin and the three southern subregions (Upson 1971).

Archaeologists partition the valley floor into just two subareas: the closed basin north of the Rio Grande and the open basin south of the Rio Grande (Hoefer 1999b). In the closed basin, which has no natural hydrologic connection to the Rio Grande, the extent of surface water in the form of lakes, wetlands, and streams varies seasonally, annually, and at longer time intervals. In the open basin, a series of permanent tributary streams flow cross the valley floor, including the Alamosa, Conejos, and San Antonio rivers on the west and Culebra and Trinchera creeks on the east. Archaeologists further partition the uplands surrounding the valley into the Sangre de Cristo subarea on the east side of the valley and the San Juan subarea on the west (Hoefer 1999b).

Miocene- and Pliocene-age deposits composed of

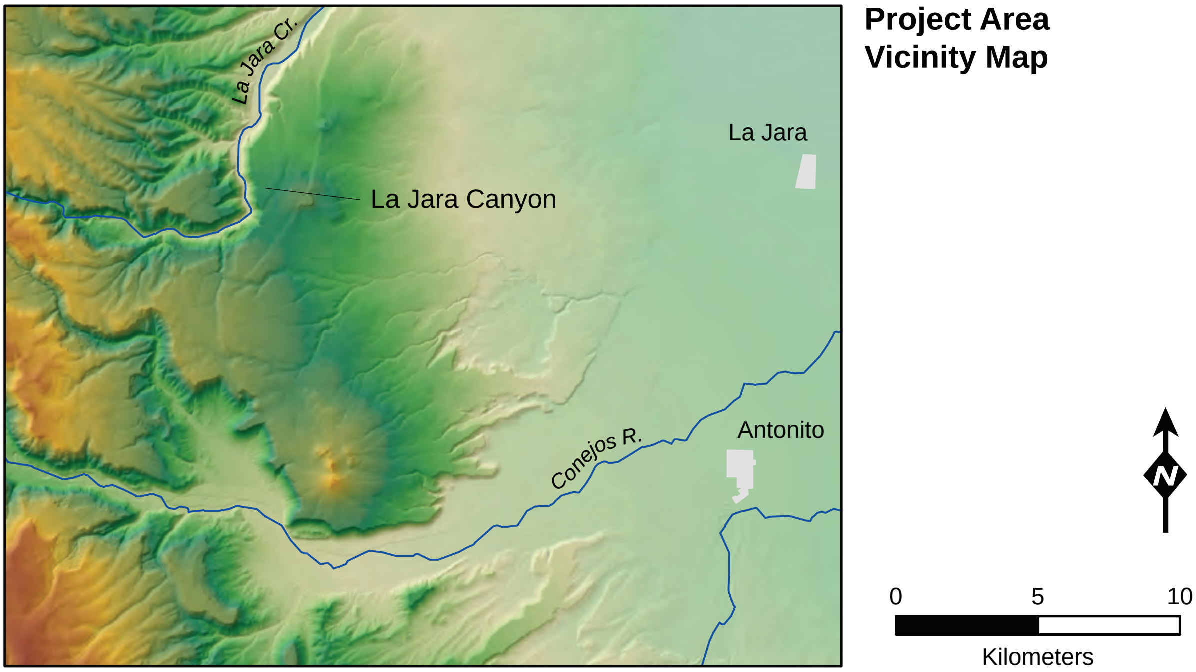



*Figure 1.2. Shaded relief map showing the project vicinity.*

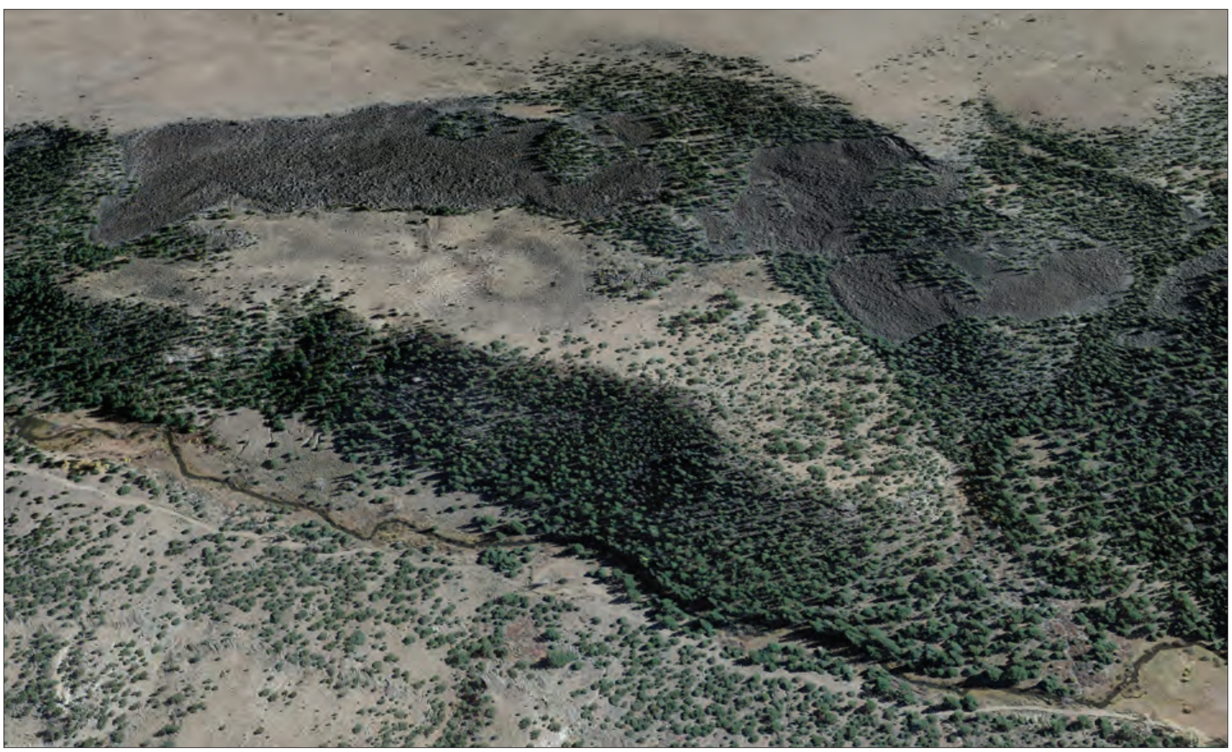


*Figure 1.3. Google Earth oblique view of the ancient strath terrace containing the La Botica site.*

interbedded gravels and fine-grained sediments (the Santa Fe and Alamosa formations) fill the San Luis Valley. The dramatic topographic relief from the valley floor and the crest of the Sangre de Cristo Mountains is a product of faulting that likely began after 15 million years ago (Madole *et al*. 2008). Quaternary fault scarps visible in the bajada on the western toe of the Sangre de Cristos point to ongoing uplift; the most recent displacements date to between 10,000 and 13,000 B.P. and to 7600 B.P. (McCalpin 1983).

## Climate

The climate of the San Luis Valley is semi-arid (table 1.1). Mean annual precipitation on the valley floor varies from about 18.5 to 24 cm. Much of this precipitation occurs during the summer monsoon, principally in July and August. Precipitation is much higher in the adjacent mountains: at Platoro in the eastern San Juans (at an elevation of about 3430 m), mean annual precipitation is 106.7 cm (27.1 in) (Western Regional Climate Center 2020).

Temperature in the San Luis Valley varies seasonally, but the mean annual high temperature is only about 60 degrees F (16 degrees C). Mean annual lows are about 25 degrees F (-3 degrees C). As a result, the growing season is just 120 days long (Hoefer 1999b). The temperature gradient between the valley floor and the foothills and higher peaks is weak; the valley commonly is cooler in winter and warmer in summer than are the surrounding uplands, but not dramatically so (Hoefer 1999b).

### *Paleoclimate*

Both high- and low-resolution data are available for reconstructing the ancient climate of the San Luis Valley (Jodry 1999b; Grissino-Mayer *et al*. 1998; Machette and Puseman 2007; Madole *et al*. 2008; Martorano 1999b). Low-resolution data consist of sediment cores from both high- and low-elevation lakes, as well as stratified terrestrial deposits. High-resolution data consist primarily of tree-ring sequences. High-elevation lake cores primarily preserve sediment dating to the Pleistocene-Holocene transition and the early Holocene. Low-elevation lake cores and terrestrial strata primarily preserve a late Holocene record. The tree-ring record spans the last millennia. Thus, a significant mid-Holocene gap exists in the paleoenvironmental record.

Pinedale (Wisconsinin) glaciers began retreating in the San Juan Mountains about 16,000 B.P. and had disappeared entirely by about 10,500 B.P. (Carrara 2011). Following a glacial advance during the Younger Dryas stadial, timberline in the Sangre de Cristo Mountains advanced upslope between 10,000 and 9000 years ago, signaling the onset of warmer temperatures and summer-dominant precipitation (Jodry 1999b). Piñon pine pollen first appears in sediment dating to about 9,500 B.P. from Como Lake, located south of Great Sand Dunes National Park and Preserve (GRSA) at about 3,700 m, possibly indicating the first appearance of that species in the San Luis Valley. However, Emslie and others (2015) cast doubt on this interpretation and conclude that the timing of piñon migration into the Rio Grande basin is currently unknown.

The climate of the San Juan Mountains was warmer and wetter that at present from about 8000 B.P. to 4000 B.P. (Adams and Peterson 1999; Carrara 2011). From about 9200 B.P. until 5800 B.P., upper treeline and timberline in the San Juans was at least 80 m, and possibly as much as 140 m, higher than at present (Carrara 2011). Treeline likely was near its present position between 5400 B.P. and 3500 B.P. The elevation of treeline may have decreased below its modern location after 3500 B.P. Data from Como Lake in the Sangre de Cristo Range point to relatively dry

Table 1.1. Climate data for three weather stations on the floor of the San Luis Valley (Western Regional Climate Center 2020).

| | Weather Station | | |
|---|---|---|---|
| Variable | Manassa (055322) | San Luis 1E (057430) | Blanca 4NW (050776) |
| Period of Record | 1893-2016 | 1980-2006 | 1909-2010 |
| Elevation (m) | 2344 | 2432 | 2364 |
| Mean Annual Maximum Temperature (°F/°C) | 59.6/15.3 | 58.7/14.8 | 59.0/15.0 |
| Mean Annual Minimum Temperature (°F/°C) | 25.6/-3.6 | 26.0/-3.3 | 25.4/-3.6 |
| Mean Annual Total Precipitation (in/cm) | 7.27/18.47 | 9.58/24.33 | 8.56/21.74 |
| Mean Annual Total Snowfall (in/cm) | 24.8/63.0 | 20.0/50.8 | 24.3/61.72 |

conditions between 7000 and 5500 B.P. (Martorano 1999b). The pool elevation of Head Lake, located on the valley floor at 2,300 m, declined significantly about 5200 B.P. (Jodry 1999b).

Low-elevation lake cores and stratified valley-floor terrestrial deposits record alternating mesic and xeric periods during the late Holocene. Madole and others (2008) infer fluctuations in the water-table along Big Spring Creek and in the hydrologic sump west of GRSA. The water-table was 1 to 1.5 m higher than at present between 3,000 and 2,000 years ago. Jones's (1977) data from 5AL80/81 suggests a much higher water-table in the Dry Lakes, south of GRSA, about 1700 B.P. Conversely, the water-table at San Luis Lake was 1 to 2 m lower than at present between 900 and 1000 B.P. (Madole *et al.* 2008). As Madole and others (2008) note, because topographic relief is low on the valley floor, small fluctuations in the water-table in the hydrologic sump can produce dramatic changes the extent of surface water and marshes.

Machette and Puseman (2007) identify a sequence of buried paleosols capping aeolian sand units on the northern edge of the open basin. The paleosols indicate periods of stability and higher precipitation at about 4800 B.P., 3600 B.P., and 2700 B.P.

The GRSA tree-ring record extends from A.D. 1035 to the present. Grissino-Mayer and others (1998) put the mean annual precipitation over that period at 32.8 cm (12.92 in.), slightly higher than the 28.2 cm value calculated from modern weather station data. The most intense drought recorded in the tree-ring data occurred between A.D. 1570 and 1600, the period corresponding to the sixteenth-century continental megadrought (Stahle *et al.* 2007). The major drought in the Southwest between A.D. 1273 and 1299 is not recorded in the GRSA data. Grissino-Mayer and others (1998) also note temporal trends in the amplitude of climatic variation over the period of record. Between A.D. 1400 and 1570, precipitation was relatively stable but after 1600 inter-decadal variability may have increased. Overall, precipitation variability declined over the last millennium, reaching a low in the late nineteenth century.

Several trends characterize climatic conditions during the last century. One is an increase in inter-decadal variation in precipitation (Grissino-Mayer *et al.* 1998). Another is increasing temperature and decreasing precipitation (De Lanois 1993). Increasing occurrence of dung fungus (Sporomiella) in recent sediment at San Luis Lake marks the introduction of livestock (De Lanois 1993). In the Saguache Creek valley, re-photography of scenes originally shot in 1913-1914 shows significant expansion of forest cover in the last 100 years.

Ecology

Owing to a combination of low but altitude-dependent precipitation and cold temperatures, the San Luis Valley is ringed by a series of distinct dryland plant communities (Dixon 1971; Bevilacqua and Dominguez 2011; Hoefer 1999b). The valley floor supports a shrubland dominated by greasewood (*Sarcobatus vermiculatus*) and other salt-tolerant species, along with grasses. Rabbitbrush (*Chrysothamnus* sp.) replaces greasewood in areas with better drainage. Patches of semi-desert grassland steppe occur within the shrubland community. A piñon-juniper (*Pinus edulis-Juniperus* sp.) woodland dominates the valley margin above about 2,450 m. A mixed conifer zone dominated by ponderosa pine (*Pinus ponderosa*) overlaps the upper end of the piñon-juniper woodland and continues upslope to about 3,200 m. The highest peaks support spruce-fir (*Picea* sp.-*Abies* sp.) and alpine grassland communities. Riparian corridors featuring aspen, cottonwood, and fruit-bearing shrubs traverse these altitude-dependent ecozones.

At La Botica, vegetation is dominated by two primary ecological communities: "Inter-Mountain Basins Big Sagebrush Shrubland" (approximately 70 percent), and "Southern Rocky Mountain Pinyon-Juniper Woodland" (approximately 10 percent) (English 2018). Also present on-site are limited areas of "Rocky Mountain Ponderosa Pine Woodland," "Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland," and "Southern Rocky Mountain Montane-Subalpine Grassland." Other communities adjacent to the site include "Gambel Oak Shrubland Alliance" and riparian vegetation along La Jara Creek. The baseline botanical inventory for the site includes approximately 65 species.

Comprehensive data on the occurrence of edible plant species in the San Luis Valley come from the GRSA, roughly 90 km northeast of La Botica (table 1.2). Most of these species are not represented by charred macrofloral remains recovered from archaeological contexts although the current roster of studied botanical samples is small and derives from a limited number of sites and a limited range of feature types. The mostly commonly recovered plant food is goosefoot (*Chenopodium* spp.) seeds.

Table 1.2. Edible plants available in the vicinity of Great Sand Dunes National Park and Preserve (GRSA) (adapted from Beuthel [2005], Bevilacqua and Dominguez [2011], Cummings *et al.* [2009], and Machette and Puseman [2007]).

| Taxon | Common Name | Presence[a] |
|---|---|---|
| Asteraceae | Sunflower Family | X |
| *Helianthus* sp | Sunflower | |
| Brassicaceae | Mustard Family | X |
| *Descurainia* sp. | Tansy Mustard | |
| Cactaceae | Cactus Family | X |
| *Echinocereus* sp. | Hedgehog Cactus | X |
| *Opuntia* sp. | Prickly Pear | |
| Cheno-Ams | - | X |
| *Amaranthus* sp. | Pigweed | X |
| *Atriplex* sp. | Saltbush | X |
| *Chenopodium* sp. | Goosefoot | X |
| *Monolepis* sp. | Poverty Weed | |
| *Sarcobatus* sp. | Greasewood | |
| Cyperaceae | Sedge Family | |
| *Scirpus* sp. | Bulrush | X |
| Poaceae | Grass Family | X |
| *Achnatherum hymenoides* | Indian Rice Grass | X |
| *Elymus* sp. | Wild Rye | |
| *Hordeum* sp. | Barley | |
| *Sporobolus* sp. | Dropseed | X |
| *Allium* sp. | Onion | |
| *Amelanchier* sp. | Serviceberry | |
| *Arctostaphylos* sp. | Kinnickinnick | |
| *Artemisia* sp. | Sagebrush | X |
| *Asclepias* sp. | Milkweed | |
| *Calochortus* sp. | Mariposa Lily | |
| *Campanula* sp. | Harebell | |
| *Chamerion* sp. | Fireweed | X |
| *Cirsium* sp. | Thistle | |
| *Claytonia* sp. | Springbeauty | |
| *Cleome* sp. | Beeplant | |
| *Crataegus* sp. | Hawthorn | |
| *Cymopterus* sp. | Stemless Cymopterus | |
| *Epilobium* sp. | Willowherb | |
| *Eriogonum* sp. | Buckwheat | |
| *Fragaria* sp. | Strawberry | |
| *Juniperus* sp. | Juniper | X |
| *Lactuca* sp. | Lettuce | |
| *Lappula* sp. | Stickseed | |
| *Linum* sp. | Flax | |
| *Mahonia* sp. | Oregon Grape | |
| *Oxyria* sp. | Sorrel | X |
| *Pinus edulis* | Piñon Pine | X |
| *Piptatherum* sp. | Littleseed Ricegrass | |

Table 1.2. Edible plants *continued.*

| Taxon | Common Name | Presence[a] |
|---|---|---|
| *Plantago* sp. | Plantain | |
| Polygonum amphibium | Knotweed | |
| *Polygonum bistortoides* | American Bistort | |
| *Portulaca* sp. | Purslane | X |
| *Prunus* sp. | Chokecherry | |
| *Psoralidium* sp. | Scurf Pea | |
| *Rhus* sp. | Skunkbush | X |
| *Ribes* sp. | Currant | |
| *Rosa* sp. | Rose | |
| *Rubus* sp. | Raspberry | |
| *Rumex* sp. | Golden Dock | |
| *Schoenoplectus* sp. | Tule | |
| *Maianthemum racemosum* | False Solomon's Seal | |
| *Sphaeralcea* sp. | Globemallow | |
| *Typha* sp. | Cattail | |
| *Vaccinium* sp. | Bilberry | |
| *Yucca glauca* | Soapweed Yucca | |

[a] Occurrence of charred macrofloral remains recovered from archaeological contexts (Beuthel [2005]; Cummings *et al.* [2009]; Machette and Puseman [2007]).

The potentially important mammal species that currently occur near the project area are listed in table 1.3. (Bison, now extirpated but historically present, is added to the list.) Only very limited faunal data from archaeological contexts are available for the region. Fariello and Dominguez (2005) and Dominguez (2008) report data on 2,066 specimens from the GRSA. The represented skeletal element and broad taxonomic or body-size group can be determined for 1,321 specimens, including 747 bones pieces representing mammals larger than 5 kg, 522 representing mammals smaller than 5 kg, 32 representing birds, and 20 representing fish. Jones (1977) reports a diverse archaeofauna from site 5AL80/81, located in the Blanca Wildlife Habitat Area south of GRSA, that includes birds, small mammals, Rio Grande chub (*Gila nigriscens*) and buffalofish (Ictiobinae). Mitchell and Falk (2012) describe a small faunal assemblage from the Upper Crossing site that includes 5 micromammal specimens, 13 small mammal specimens (Sciuridae, likely black-tailed prairie dog [*Cynomys ludovicianus*]), 19 small artidactyl specimens (mule deer [*Odocoileus hemionus*], pronghorn [*Antilocapra americana*] or bighorn sheep [*Ovis canadensis*]), and 1 large artitiodactyl specimen (bison [*Bison bison*] or elk [*Cervas elephas*]).

Table 1.3. Selected mammal species currently present in the vicinity of the project area (Natural Diversity Information Source 2011).

| Common Species Name | Taxon | Abundance |
|---|---|---|
| Abert's Squirrel | *Sciurus aberti* | Fairly Common |
| American Badger | *Taxidea taxus* | Common |
| American Beaver | *Castor canadensis* | Fairly Common |
| American Elk | *Cervus elaphus* | Abundant |
| American Marten | *Martes americana* | Fairly Common |
| American Pika | *Ochotona princeps* | Common |
| Bighorn Sheep | *Ovis canadensis* | Common |
| Bison | *Bison bison* | Extirpated |
| Black Bear | *Ursus americanus* | Common |
| Black-tailed Jackrabbit | *Lepus californicus* | Uncommon |
| Bobcat | *Lynx rufus* | Common |
| Bushy-tailed Woodrat | *Neotoma cinerea* | Fairly Common |
| Colorado Chipmunk | *Tamias quadrivittatus* | Fairly Common |
| Common Muskrat | *Ondatra zibethicus* | Common |
| Common Porcupine | *Erethizon dorsatum* | Uncommon |
| Coyote | *Canis latrans* | Common |
| Deer Mouse | *Peromyscus maniculatus* | Abundant |
| Desert Cottontail | *Sylvilagus audubonii* | Abundant |
| Golden-mantled Ground Squirrel | Spermophilus lateralis | Fairly Common |
| Gray Fox | *Urocyon cinereoargenteus* | Rare |
| Gunnison's Prairie Dog | *Cynomys gunnisoni* | Fairly Common |
| House Mouse | *Mus musculus* | Abundant |
| Least Chipmunk | *Tamias minimus* | Common |
| Long-tailed Vole | *Microtus longicaudus* | Fairly Common |
| Long-tailed Weasel | *Mustela frenata* | Fairly Common |
| Masked Shrew | *Sorex cinereus* | Fairly Common |
| Meadow Vole | *Microtus pennsylvanicus* | Common |
| Mink | *Mustela vison* | Uncommon |
| Montane Shrew | *Sorex monticolus* | Common |
| Montane Vole | *Microtus montanus* | Common |
| Moose | *Alces alces* | Uncommon |
| Mountain Cottontail | *Sylvilagus nuttallii* | Fairly Common |
| Mountain Goat | *Oreamnos americanus* | Casual/Accidental |
| Mountain Lion | *Felis concolor* | Common |
| Mule Deer | *Odocoileus hemionus* | Common |
| Northern Grasshopper Mouse | *Onychomys leucogaster* | Fairly Common |
| Northern Pocket Gopher | *Thomomys talpoides* | Common |
| Ord's Kangaroo Rat | *Dipodomys ordii* | Abundant |
| Pine Squirrel | Tamiasciurus hudsonicus | Fairly Common |
| Plains Pocket Mouse | *Perognathus flavescens* | Fairly Common |
| Pronghorn | *Antilocapra americana* | Abundant |
| Raccoon | *Procyon lotor* | Fairly Common |
| Red Fox | *Vulpes vulpes* | Common |
| Silky Pocket Mouse | *Perognathus flavus* | Fairly Common |
| Snowshoe Hare | *Lepus americanus* | Common |
| Southern Red-backed Vole | *Clethrionomys gapperi* | Fairly Common |
| Striped Skunk | *Mephitis mephitis* | Common |
| Thirteen-lined Ground Squirrel | *Spermophilus tridecemlineatus* | Common |
| Water Shrew | *Sorex palustris* | Uncommon |

Table 1.3. Selected mammal species *continued*.

| Common Species Name | Taxon | Abundance |
|---|---|---|
| Western Harvest Mouse | *Reithrodontomys megalotis* | Fairly Common |
| Western Jumping Mouse | *Zapus princeps* | Fairly Common |
| Western Spotted Skunk | *Spilogale gracilis* | Rare |
| White-tailed Jackrabbit | *Lepus townsendii* | Common |
| Wyoming Ground Squirrel | *Spermophilus elegans* | Common |
| Yellow-bellied Marmot | *Marmota flaviventris* | Common |

### Geology

Numerous sources of high-quality toolstone, some of which are highly productive, occur within and near the San Luis Valley, although they are unevenly distributed. The Sangre de Cristo Mountains, which form the valley's eastern boundary, do not contain significant sources of stone tool raw material. The range's core rocks consist of Precambrian granites, gneisses, and quartz monzonite, as well as Paleozoic conglomerate, arkose, sandstone, and shale (Cappa and Wallace 2007), none of which are suitable for chipped stone tool production. Isolated outcrops of undivided Lower Mississippian to Upper Cambrian rocks (potentially including exposures of the Leadville Limestone, Fremont Dolomite, Manitou Formation, or Sawatch Quartzite) may contain usable toolstone; however, the presence of exploitable raw materials has so far not been reported (Hendrickson *et al*. 2011).

By contrast, numerous toolstone sources are present on the valley's western side, including in the Saguache Creek valley (chert, chalcedony, rhyolite, and orthoquartzite), in the La Garita Mountains (rhyolite and chert), and the eastern San Juan Mountains (rhyolite and chert). Significant toolstone quarries also occur north of the valley in the Southern Front Range Mountains (South Park Hills) and north and south of the Colorado-New Mexico state line in the Taos Plateau Volcanic Field (Black 2000, 2007:11-12, 2013; Boyer *et al*. 2001; Mitchell 2012a; Shackley 2011; Wunderlich 2011).

Raw materials obtained from quarries in the Taos Plateau Volcanic Field are especially abundant on sites in the southern end of the San Luis Valley. Dacite, a gray to black volcanic rock that is similar in color to basalt but exhibits superior fracture properties, outcrops on San Antonio Mountain and elsewhere in the Northern Rio Grande (Boyer *et al*. 2001; Shackley 2011, 2013). Obsidian also appears in archaeological contexts in the San Luis Valley. Most, if not all, of the obsidian found on San Luis Valley sites comes from sources in the Jemez Mountains in northern New Mexico (Baugh and Nelson 1987; Glascock *et al*. 1999; Shackley 2005).

## Archaeological Context

Data on the indigenous occupation of the San Luis Valley and vicinity have accumulated rapidly in the last twenty years. However, the archaeology of the Rio Grande basin in Colorado remains poorly understood. This is particularly true of the Archaic and Late Prehistoric stages. Accordingly, this brief overview integrates data from adjacent regions, including the Northern Colorado River basin to the northwest and the Arkansas River basin to the east. Table 1.4 summarizes the ages of the broad chronological divisions used to systematize archaeological data from these regions.

There is also a long history of anthropological and archaeological research in north-central New Mexico, the results of which are important for understanding both the indigenous and settler history of the San Luis Valley. Research in the Taos Valley has been especially important. Early work focused primarily on the most conspicuous Pueblo sites and settlements, while mid- and late-twentieth century projects investigated a wide variety of Pueblo and earlier sites. The Archaic archaeology of the Northern Rio Grande has been an important focus of research during the last 20 years.

Additional syntheses are provided by Athern (1992); Cordell (1979), Eiselt (2012), Martorano and others (1999), Mitchell and Krall (2020), Riley (1995), Stanford (1999), and Vierra (*ed*. 2013).

### Paleoindian Stage

As is true of the Southern Rockies and northern Southwest generally, relatively little is known about the Paleoindian archaeology of the Northern Rio Grande (Vierra *et al*. 2012). However, Folsom period use of the San Luis Valley and adjacent mountains is

Table 1.4. Chronology of major culture-historical divisions in three Colorado river basins. To simplify comparison, all ages are reported in uncalibrated radiocarbon years before 1950 ($^{14}$C yr B.P.).

| Era, Stage, or Period | Northern Colorado River Basin (Reed and Metcalf 1999) | Rio Grande Basin (Martorano *et al.* 1999) | Arkansas River Basin (Zier and Kalasz 1999) |
|---|---|---|---|
| Paleoindian | ~11,500 – 8350 | 11,200 – 7450 | 11,500 – 7800 |
| Archaic | 8350 – 1950 | 7450 – 1450 | 7800 – 1850 |
| Formative/Late Prehistoric/Ceramic | 2350 – 650 | 1450 – 350 | 1850 –500 |
| Protohistoric | 650 – 69 | 350 – 69 | 500 – 225 |

relatively well attested: 43 localities are known, and excavation data are available from four sites (Jodry 1999a). Folsom sites are also the most common Paleoindian sites in Judge's (1973) Central Rio Grande Valley sample.

In the San Luis Valley, Folsom camps occur in a wide variety of ecological settings, from the valley floor to timberline in the eastern San Juan Mountains. Camps on the valley floor are associated with bison kill and butchery localities; bison population density likely peaked in the San Luis Valley during Folsom times (Jodry 1999b).

The most important Folsom sites in the mountains surrounding the San Luis Valley are the Black Mountain site in the eastern San Juan Mountains and the Mountaineer site in the Gunnison River basin. At 3,097 m, the Black Mountain site is the highest excavated Folsom campsite (Jodry 1999a). Located in a forest-edge setting adjacent to an upper tributary of the Rio Grande, the site consists of two concentrations of flaking debris and stone tools indicative of a multi-function camp, where hunters refurbished equipment for the next kill. At the Mountaineer site, located at 2,630 m on an isolated mesa overlooking the Gunnison River, a Folsom band built a roughly circular structure made of daub-covered poles (Stiger 2006). Both Black Mountain and Mountaineer are indicative of a generalized, rather than focal, use of high-country settings by Folsom people.

Paleoindian technocomplexes other than Folsom are less well represented in the region. Isolated surface finds of Clovis points are reported from a variety of settings (Cordell 1979; Jodry 1999a; Judge 1973). A few Agate Basin and Hell Gap style projectile points have been reported, but no sites associated with these types are currently known in the Northern Rio Grande or San Luis Valley. More common are Middle to Late Paleoindian Cody and Plainview/Belen sites (Holliday *et al.* 2017; Jodry 1999a; Vierra *et al.* 2012).

In Southern Rockies, Late Paleoindian lanceolate points exhibiting parallel-oblique flaking, a slightly-to strongly-concave base, and ground lateral margins are more common than are earlier Paleoindian types (Jodry 1999a; Pitblado 1998; Reed and Metcalf 1999). Points exhibiting these attributes generally are assigned to the Angostura, James Allen, or Frederick types date to between 9000 and 8000 B.P. A variety of approximately contemporaneous types that are assigned to the Foothills-Mountain complex include weakly stemmed forms and some that exhibit parallel-transverse to collateral flaking patterns (Frison 1992; Kornfeld *et al.* 2010). Many Late Paleoindian flintknappers preferred quartzites or other brittle materials for making projectile points (Bradley 2010; Pitblado 2003; Reed and Metcalf 1999). Late Paleoindian groups living in the mountains pursued a broad-spectrum subsistence strategy, in contrast to their bison-focused contemporaries in the Plains (Frison 1992).

### Archaic Stage

During the Early Holocene, the climate of western North American was much warmer and dryer than at present and those conditions spurred significant and enduring changes in American Indian lifeways (Geib and Jolie 2018; Huckell 1996). Mobility decreased and use of local resources increased. Diets changed as harvesting and processing of seeds, roots, and other plant resources intensified. Hunting weaponry shifted from lanceolate styles to a variety of stemmed and notched styles. Taken together these changes mark the beginning of the Archaic stage.

In the Rio Grande basin, few Archaic stage sites have been investigated intensively. However, a context for the San Luis Valley Archaic can be built using data and interpretations from adjacent regions. The record for the Northern Colorado River basin, including the Gunnison River basin immediately northwest of the San Luis Valley, is the most comprehensive. In the Arkansas River basin, Early Archaic sites are uncommon but data from Middle and Late Archaic sites are relatively abundant. Data also are available for Archaic occupations in northern New Mexico.

Many researchers working in the Southern Rockies accept the view that Archaic hunter-gatherers living there practiced a local, year-round, mountain-focused settlement and subsistence system distinct from that of groups living in adjacent regions (Black 1991). Most researchers also recognize long-term adaptive continuity in the region, beginning as early as the Late Paleoindian period (Metcalf 2011). Whether this also reflects cultural continuity remains a subject of debate (Stiger 2001), as do the specific attributes that define a mountain adaptation (Reed and Metcalf 1999).

Reed and Metcalf (1999) partition the Archaic era in the Northern Colorado River basin into four periods. The earliest, dubbed the Pioneer period (8350-6450 B.P.), marked the initial settlement of the region by full-time residents practicing a seasonal settlement system. During the subsequent Settled period (6450-4450 B.P.), local bands practiced a central-place subsistence strategy that featured a combination of logistical moves around strategic habitation areas in the winter and residential mobility in the summer. This basic pattern continued into the Transitional period (4450-2950 B.P.), but was accompanied by increasing material culture variation, more restricted use of higher-elevation life zones, and possibly decreased sedentism. The final Archaic period, the Terminal (2950-1950 B.P.), was a period of subsistence stress that prompted various forms of economic intensification as well as technological change. (Metcalf [2011] revises the bracketing dates and durations of the Reed and Metcalf [1999] periods and argues for the use of neutral period names, including the Paleo-Archaic, Early Archaic, Middle Archaic, and Late Archaic.)

Stiger (2001) offers a model of settlement and subsistence change for the Gunnison basin. In Stiger's scenario, people took up full-time residence in the basin after 8000 B.P. Their central-place foraging system featured large and small mammal hunting combined with bulk processing and storage of plant resources. This basic pattern continued, apart from a brief interruption between 5000 and 4500 B.P., until about 3000 B.P., when central-place residences were replaced by seasonal, special-use sites occupied by groups wintering outside the basin. This shift coincided with local extirpation of piñon pines (Emslie *et al*. 2014).

Exploitation of the tundra ecosystem in the San Juan Mountains, above roughly 3,400 m, occurred primarily during the Archaic (Mitchell 2012b). Intensive use began at least by 5000 B.P. and declined after about 2000 B.P. The frequent occurrence on San Juan alpine sites of obsidian from source locations in northern New Mexico indicates that native groups using the high country maintained strong connections to the northern Southwest. However, the marked diversity of the stone tool raw materials present on many high-elevation sites, including a variety of cherts, orthoquartzites, rhyolites, and basalts, suggests either that a broad trade network linked groups living around the perimeter of the San Juans or that groups from different regions came together in the high country. Most San Juan high country sites are small, suggesting that they represent brief occupations. Assemblage diversity data indicate that high country land-use strategies were generalized, rather than focal.

In the Arkansas River basin, Middle Archaic sites, dating between 5000 and 3000 B.P., are located in a wide variety of ecological settings, from mid-elevation mountain valleys, to the Plains-foothills ecotone, to canyons and open steppe in the Plains (Zier 1999). Especially significant are Middle Archaic occupations in rockshelters, including Draper Cave (5CR1), Recon John Shelter (5PE648), Gooseberry Shelter (5PE910), and Wolf Spider Shelter (5LA6197) (Hagar 1976; Hand and Jepson 1996; Zier 1999; Zier and Kalasz 1991). The Dead of Winter site (5LK159) is the most thoroughly investigated Middle Archaic occupation in the mountains (Buckles 1978).

Middle Archaic sites in the Arkansas basin are primarily located near reliable water sources (Zier 1999). Both open and sheltered sites exhibit evidence of regular reoccupation. The diversity of tool types present, along with the frequent occurrence of hearth features, suggests that these sites represent multi-activity residential camps. Floral and faunal inventories point to a broad-spectrum subsistence strategy. Together, assemblage diversity and evidence for reoccupation may reflect a small-group foraging economy; however, the potential for preservation differences between sheltered and open sites complicates interpretations of mobility patterns.

Late Archaic (3000 B.P-1850 B.P.) sites also occur throughout the Arkansas River basin, including in the open steppe, in shallow and deep canyons, in the Plains-foothills ecotone, and in high-elevation valleys. Important Late Archaic rockshelter sites include several that also contain Middle Archaic deposits (Recon John, Gooseberry, and Wolf Spider), as well as Two Deer (5PE8), Carrizo (5LA1053), and Medina (5LA22) (Campbell 1969; Zier 1999). Open sites in steppe and shallow-canyon settings are widespread and common, but few have been intensively investigated. Excavated sites in the mountains include the Runberg site on Cottonwood Pass (Black 1986), the Venado Enojado site east of Buena Vista (Mitchell 2019), and site 5LK199 and the Campion Hotel site southwest of Leadville (Zier 1999).

The co-occurrence of both Middle and Late Archaic cultural deposits at many Arkansas basin sites indicates long-term continuity in subsistence practices and mobility patterns (Zier 1999). Late Archaic radiocarbon dates are more numerous than Middle Archaic dates, but this likely is due to preservation and research biases rather than to an increase in population. Late Archaic deposits in stratified rockshelters generally are thicker and richer than Middle Archaic deposits, suggesting an increase in site-use intensity over time. The broad-spectrum subsistence strategy that began in the Middle Archaic continued into the Late Archaic. Late Archaic faunal and macrofloral assemblages are somewhat more diverse than Middle Archaic assemblages, but it is unclear whether this reflects increased diet breadth or sampling biases. Maize remains definitely occur in three Late Archaic assemblages, the earliest of which, from Gooseberry Shelter, dates to 2600 B.P. However, maize was certainly a minor element of Late Archaic diets and its occurrence did not lead to a real shift in subsistence practices (Zier 1999).

In the Rio Grande basin, data on Archaic stage archaeology frequently are organized around the periods of the Oshara tradition, a cultural taxonomy that Irwin-Williams (1973) developed to trace the antecedents of Pueblo culture in the northern Southwest. Based primarily on data from the Arroyo Cuervo region, located about 50 km northwest of Albuquerque, New Mexico, the Oshara tradition divides pre-Puebloan archaeology in to five phases spanning the period from about 7500 B.P. to 1550 B.P. These phases include the Jay (7500-6750 B.P.), the Bajada (6750-5150 B.P.), the San Jose (5150-3750 B.P.), the Armijo (3750-2750 B.P.), and the En Medio (2750-1550 B.P.).

In Irwin-Williams's scenario, components of the Jay and Bajada phases represent small-group, short-term residential camps. Jay and Bajada microbands practiced a local, year-round, "mixed spectrum" subsistence strategy (Irwin-Williams 1973:5). Climate, and therefore resource patch productivity, improved during the subsequent San Jose phase, permitting an increase in site-use intensity. Diet breadth increased, especially through the incorporation of more small seeds and other floral resources.

Important subsistence and settlement changes took place during the Armijo phase. Paralleling a similar development in the Arkansas basin, limited quantities of maize appear in Armijo phase macrofloral assemblages. Fall or fall-winter seasonal aggregation sites first appeared during this time, as did special-function sites. The final Archaic phase of the Oshara tradition, the En Medio, witnessed an amplification of trends begun during the Armijo. Storage features first appeared during the En Medio phase and ground stone tools became more common and morphologically diverse. Irwin-Williams argues that increases in the number of sites and in the size and intensity of site use reflect population growth during the En Medio phase. Bands began exploiting seasonally productive, but previously untapped, resource patches. This shift may point to either an increasing reliance on logistical organization or to periodic small-group residential mobility punctuated by annual macroband aggregation.

Although Irwin-Williams identifies material similarities between the phases of the Oshara tradition and Renaud's (1942, 1944, 1946) Rio Grande complex, which he defines using San Luis Valley data, the dearth of excavated Archaic-stage sites in the Rio Grande basin has nevertheless limited the development of region-specific chronologies or settlement models (Hoefer 1999a). All of the published radiocarbon dates come from sites within or immediately adjacent to the GRSA in the east-central portion of the valley, and most of these derive from individual features rather than from stratigraphic sequences.

Bevilacqua (2011a) reports 57 radiocarbon dates from GRSA contexts. Five are too recent to calibrate and a single date from a site immediately outside the park can be added to the list (Jones 1977). Among the 53 interpretable dates, 32 come from Archaic contexts, between 7450 and 1450 B.P. The median date is 2380 B.P. and arithmetic mean date is about 2800 B.P. Thus, the latest Archaic contexts—which could be assigned to the Late Archaic period, the En Medio phase, or the Terminal period—are much more abundantly represented in the radiocarbon record than are all other Archaic contexts.

Among the most interesting dated Archaic contexts is site 5AL80/81, a multi-function camp located on the valley floor just west of GRSA that produced flaked stone tools, ground stone tools, and a diverse archaeofauna composed of fish, bird, and mammal remains (Farmer 1978; Jones 1977). However, most Archaic sites located on the west flank of the Sangre de Cristo Mountains consist of concentrations of burned rock and ground stone tools, indicative of intensive processing of plant resources, possibly including Indian ricegrass (*Achnatherum hymenoides*) and piñon nuts (*Pinus edulis*) (Bevilacqua *et al*. 2008; Bevilacqua and Dominguez 2011; Martorano *et al.* 2005; Wunderlich and Martorano 2015). The attributes of these sites and their associated assemblages point to seasonal, logistical use of this portion of the valley (Andrews *et al.* 2004). The fact that logistical use of the eastern valley margin dates primarily to the mid- to late En Medio lends some support to Irwin-Williams's proposed developmental sequence for the Oshara tradition.

Architectural features are important elements of the Archaic stage record in the Southern Rockies (Pool and Reed 2020). Winter-occupied habitation structures appeared in the Northern Colorado River basin as early as the Pioneer period and are well attested through the Transitional period (Pool and Moore 2011; Reed and Metcalf 1999; Rood 1998; Shields 1998; Stiger 2001). Most were semi-subterranean with shallow, saucer-shaped floors. Superstructures varied significantly, incorporating upright poles or cribbed logs along with lighter materials in a variety of configurations. Many incorporated adobe plaster. Other Archaic-period structure types include wickiups (timbered lodges) and masonry surface structures (Black 1990).

Just one Middle Archaic basin house is known from the Arkansas River context area (Zier 1999). However, a cluster of such features has been documented immediately north of the Arkansas-South Platte divide in Douglas County, Colorado (Gantt 2007). Habitation structures dating the Late Archaic also are uncommon in the Arkansas basin, but include basin houses at the McEndree Ranch site in Baca County (Shields 1980) and at the Veltri site in the upper Purgatoire River valley (Rood 1990).

Documented Archaic-stage architectural features in the San Luis Valley include four basin houses at two sites located in the GRSA and one probable basin house at the Upper Crossing site in the middle Saguache Creek valley (Bevilacqua 2011b; Mitchell 2012a). Two of the GRSA basin houses have been excavated, yielding a Middle Archaic date for one structure at the Big Spring site (5SH181) and a Late Archaic date for another at the Little Spring site (5AL10) (Jodry 2002). The probable basin house at Upper Crossing likely dates to the Late Archaic. Hoefer (1999a) assigns some of the Rio Grande basin's stone enclosures to the Archaic, but no radiocarbon dates are available to confirm this. However, rock art panels that may date to the Archaic occur on four sites that also include stone enclosures (Hoefer 1999a:123).

One hallmark of Archaic assemblages from the Southern Rockies is the diversity of associated projectile point styles (Mullen 2009; Reed and Metcalf 1999). Many Archaic point styles were produced over long periods of time and many well-dated components incorporate multiple styles. As Reed and Metcalf (1999:86) observe, "broad series show some patterning, but the rule is for diversity within sites and temporal periods." For the San Luis Valley and adjacent mountains, this problem is compounded by the routine use of style names linked to sequences originally developed for sites in other regions, including the northern Southwest, the Great Basin, and the Plains. In view of the chaotic diversity of Archaic point types in the Southern Rockies, it is likely that projectile point morphology there provides little or no information on interregional cultural connections (Stiger 2001). More importantly, this diversity means that the morphologies of projectile points recovered from surface contexts cannot be used to assign sites to particular periods within the Archaic.

### Late Prehistoric or Formative Stage

Diversity characterizes the post-Archaic record of the Southern Rockies and adjacent areas. Reed and Metcalf (1999) partition the Formative era in the Northern Colorado River basin into a series of separate cultural traditions, including the Fremont, Gateway, Anasazi, and Aspen traditions. All share use of the bow and arrow. With the exception of the Aspen tradition, all of the Northern Colorado River basin's Formative societies relied to some extent on maize cultivation, though it was less important to them than it was to the ancestral Puebloan farmers who lived south of the San Juan Mountains. Northern Colorado's Formative-era architectural features varied in design and construction technology, both within and between traditions. Manufacture and use of pottery also varied: some groups relied heavily on high-quality vessels while others used pottery only to a limited extent. Settlement systems also varied.

In some locations, Formative-era people maintained Archaic-era settlement and subsistence patterns but in others they were tethered to long-term habitation sites near maize fields. Formative-era projectile point styles are less diverse than are those of the Archaic.

In the Arkansas River basin, Late Prehistoric stage archaeology is partitioned into two periods (Kalasz *et al.* 1999). (Kalasz and others [1999:250-263] also include the Protohistoric period in the Late Prehistoric stage; however, the post-500 B.P. archaeology of the Rio Grande basin is considered separately in the next section.) The beginning of the Developmental period (1850-900 B.P.) was marked by the first appearance of the bow and arrow and, perhaps asynchronously, ceramic containers. Small corner-notched arrow points occur at Recon John Shelter as early as 1900 B.P. Pottery may be present on several roughly contemporaneous sites and definitely occurs on sites dating to between 1500 and 1700 B.P. However, apart from these undoubtedly important technological changes, Developmental period lithic technology is markedly similar to that of the preceding Late Archaic period, a pattern indicative of local cultural development.

Goosefoot (*Chenopodium* sp.) seeds dominate Developmental period macrofloral assemblages. Other wild plant foods include a variety of cacti and weedy annuals. Remains of maize are consistently, though not ubiquitously, present. However, maize likely was not significant a component of Developmental period diets (Kalasz *et al.* 1999). Developmental period archaeofauna are very diverse and include numerous small mammals in addition to small and large artiodactyls.

In the Plains, Developmental period architectural features are uncommon and varied. The best-known include two basin houses at the Belwood site, one with a low encircling rock foundation; an enigmatic basin house at the Running Pithouse site; and two stone enclosures at the Forgotten site (Kalasz *et al*. 1999). By contrast, circular to oval basin houses with rock foundations are relatively common in the southern Park Plateau, in the Plains-foothills ecotone.

The succeeding Diversification period (900-500 B.P.) in the Arkansas basin is characterized by increased investment in domestic architecture and by the widespread use of triangular, side-notched arrow points (Kalasz *et al.* 1999). The Diversification period is further partitioned into the Sopris phase and the Apishapa phase. Sopris phase sites are confined to the Park Plateau, both north and south of the New Mexico-Colorado border, while Apishapa phase sites occur throughout a broad arc south the Arkansas River. Sopris phase houses are heterogeneous and include both single- and multiple-room structures built from stone masonry, adobe, and jacal. Apishapa phase houses include single- and multiple-room structures built nearly exclusively from vertical slabs. Stone barrier walls or fences also are common, as are walled or partitioned rockshelters.

Although wild resources continued to be the backbone of Diversification period diets, the consumption of maize clearly increased. Small mammals appear to dominate rockshelter archaeofauna while bison dominate open-site archaeofauna (Kalasz *et al.* 199:218). Interregional interaction increased during the Diversification period, particularly for Sopris phase communities who maintained routine connections with ancestral Puebloans in the Rio Grande basin.

Comparatively little is known about the archaeology of the Late Prehistoric or Ceramic stage in the San Luis Valley (Martorano 1999a). The early Late Prehistoric encompasses Irwin-Williams's (1973) Trujillo phase. Trujillo phase groups adopted bow-and-arrow technology and used a modest number of ceramic containers. However, Irwin-Williams detects no change from earlier En Medio phase economic practices. Economic intensification that began in Armijo phase times continued through the En Medio and into the Trujillo. Both En Medio and Trujillo phase sites represent a "strongly seasonal annual economic cycle" (Irwin-Williams 1973:14).

Maize horticulture likely was not possible north of the New Mexico-Colorado border. The data suggest that the San Luis Valley and adjacent foothills and mountains were used both by indigenous hunter-gatherers and by groups who resided for much of the year either farther south along the Rio Grande or to the east in the Arkansas River basin. Late Prehistoric sites occur primarily on the floor of the San Luis Valley, especially along San Luis and Saguache creeks and in the hydrologic sump west of GRSA (Martorano 1999a:133). Many are large and exhibit diverse tool assemblages suggestive of central-place foraging camps.

Use of the San Luis Valley by ancestral Pueblo groups, particularly during the Pueblo II and Pueblo III periods, is attested by data from several sites, including the Mill Creek site (5SH354) and Saguache Shelter (5SH1458) on the northern end of the valley. Cord-marked pottery found sporadically throughout the valley suggests visits by Plains groups (Bevilacqua 2011c; Martorano 1999a).

The number of people living in the San Luis Valley and adjacent regions peaked during the Late Prehistoric, but the timing of local peaks likely varied. In the Northern Colorado basin, population peaked at about 950 B.P then began declining slowly. South of the San Juan Mountains, ancestral Puebloan population waxed and waned locally, but likely reached a regional peak between 800 and 700 B.P., immediately prior to a sharp decline just prior to 650 B.P. (Lipe and Varien 1999). Radiocarbon data from the San Luis Valley suggest a population peak early in the first millennium, followed by a significant decline. However, most of the available radiocarbon data come from sites located within or adjacent to GRSA and so may not be representative of valley-wide trends. In northern New Mexico, population likely peaked during the early centuries of the first millennium (Irwin-Williams 1973:12). Population in the Arkansas basin likely rose during the Developmental period and peaked about 750 B.P.

Archaeologists working in the Northern Rio Grande in New Mexico have long recognized that maize horticulture and Ancestral Pueblo occupation came late to the region compared to other parts of the northern Southwest (Vierra and McBrinn 2016). Vierra and others (2018) argue that this late persistence of a hunting-and-gathering economy was due to the comparative abundance of higher-ranked plant and animal resources, including pinon nuts and deer. Regardless of the reason, Ancestral Pueblo people appear to have first come to the Taos Valley about A.D. 1100 or perhaps a litter earlier (Boyer *et al.* 1994). The late persistence of hunter-gatherers, combined with the immigration of Pueblo people from the south, encouraged intimate social interactions between foragers and farmers in the Northern Rio Grande, interactions that had long-term consequences (Boyer 2008; Fowles 2005; Vierra *et al.* 2018).

The earliest Puebloan occupation of the Taos Valley is known as the Valdez phase (A.D. 1100 – 1225 [Boyer *et al.* 1994]). Crown (1990) argues for a slightly earlier beginning for the Valdez phase at A.D. 1050. Valdez phase sites mostly consist of scattered homesteads or hamlets represented by one or a few pithouses. In some cases, the pithouses are associated with jacal surface structures. A few larger surface structures have also been attributed to the Valdez phase. Both round and square or rectangular pithouses occur, with round structures more common on the south end of the Taos Valley, including in the Rio Grande de Ranchos, and square more common on the north. Ceramic assemblages consist of Taos Gray utility wares and Taos Black-on-White decorated wares.

The succeeding Pot Creek phase (A.D. 1225 – 1260 or 1270 [Crown 1990]) was a period of population aggregation out of Valdez phase farmsteads and into small pueblos. Pot Creek phase sites occur throughout the Taos Valley. The first appearance of kivas in the area may date to the Pot Creek phase. Production of Taos Gray utility wares continued, although frequencies of the incised and neck-banded varieties declined while the frequency of the corrugated variety increased. Taos Black-on-White was partially replaced by the carbon-painted Santa Fe Black-on-White.

Aggregation continued during the Talpa phase (A.D. 1260 or 1270 – 1320s [Crown 1990]). Smaller Pot Creek phase pueblos were abandoned, and Pot Creek Pueblo grew to about 300 ground-floor rooms. Talpa Black-on-White and Taos Gray pottery was produced during the Talpa phase.

The abandonment of Pot Creek Pueblo marks the end of the Talpa phase. However, Ancestral Pueblo occupation of the Taos Valley continued at Cornfield Taos and in the Rio Pueblo Valley at Picuris (Dick *et al.* 1965; Ellis and Brody 1964). Vadito Black-on-White, a successor to Talpa Black-on-White, was produced between about A.D. 1325 and 1600 (Wilson 2007). Taos Gray may have continued as the local utility ware until the early eighteenth century (Levine 1994).

### Post-500 B.P. Indigenous Archaeology

Ceramic and rock art evidence indicates that numerous groups visited the San Luis Valley and surrounding mountains after 500 B.P., including ancestral Puebloans, multiple Apache bands, Utes, Comanches, Navajos, and possibly other groups (Bevilacqua 2011c; Cole 2008; Crosser *et al.* 2008; Eiselt and Darling 2012; Martorano 1999c; Mitchell 2012a; White 2005). However, by about 250 B.P. the Utes were the dominant cultural group occupying the region. Utes, or related Numic-speaking peoples, first appeared in the Southern Rockies around 850 B.P. (Reed 1994), though debate continues both on the timing of their arrival and on their relationships, if any, to Formative or Late Prehistoric groups (Reed and Metcalf 1999).

Post-500 B.P. projectile point styles include triangular side-notched and unnotched arrowpoints. Documented architectural features include conical timber lodges, brush wickiups, forked-stick hogans, and possibly circular spaced-rock features (Martorano 1999c; Reed and Metcalf 1999; Wilshusen and Towner 1999).

Perhaps the most common and visible type of archaeological resource dating the last several centuries is culturally modified or peeled trees (Martorano 2011). American Indians harvested tree bark for comestible and medicinal purposes, for building materials, and to obtain raw materials for manufacturing a wide variety of tools, containers, and other objects. Scars left by harvesting are readily observable on both living and dead trees in many parts of the western United States and Canada

Spanish Period (1540 – 1821)

Although Spain had sent both military and civilian expeditions to the Rio Grande Valley in the sixteenth century, it was not until 1598 that Don Juan de Oñate established the first colony in New Mexico (Spicer 1962). In July 1598, Oñate visited Picuris and Taos pueblos but did not enter the San Luis Valley in Colorado. That first Spanish colony at Ohkey Owingeh (San Juan) was moved in 1610 to what is now Santa Fe. Spain's influence on the Rio Grande Valley slowly expanded through the seventeenth century, as missions and land grants were established. In the 1620s, the Franciscan Alonso de Benevides visited and later wrote about missions that had been established at the Northern Tiwa pueblos.

The Pueblo Revolt of 1680—in which Taos Pueblo played a leading role—temporarily halted Spanish colonization of New Mexico. The Revolt also greatly affected the indigenous political economy of the Northern Rio Grande and San Luis Valley. Taos Pueblo had long maintained connections with mobile groups living in the Plains and Southern Rockies (Spielmann 1991), but when the Spanish returned in the 1690s they found that relationships among native groups had changed substantially. By the early eighteenth century, Apaches had become permanent residents of the region (Eiselt 2009) and Comanches and Utes were regular visitors (Fowles *et al.* 2017).

The Spanish return to the Northern Rio Grande in 1692 was led by Don Diego de Vargas. In 1694, Vargas again attempted to subjugate the northern Pueblos. However, his return trip to Santa Fe involved a long detour to the north, following trails into the San Luis Valley that more than a century later would become the Trapper Trail and the North Branch of the Old Spanish Trail (OST) (Colville 1996).

Although the OST would not be established until after Mexican Independence, Spain recognized as early as the 1760s the need for a commercial link between New Mexico and missions of California (Hafen and Hafen 1993). The search for a viable route began both from the east in Santa Fe and from the west in Los Angeles. The most important exploration conducted by Spain occurred in 1776, when Francisco Garcés explored eastward from Los Angeles and Francisco Atanasio Dominguez and Silvestre Vélez de Escalante explored westward from Santa Fe.

Mexican Period (1821 – 1848)

Mexican Independence dramatically shifted trade relationships in the Northern Rio Grande and San Luis Valley. Independence severed Mexico's connection to Europe. The peripheries of what had been New Spain were especially hard-hit. In response, the Mexican government welcomed commercial ventures with U.S. businesses. The most immediate response was the opening of the Santa Fe Trail between Franklin, Missouri, and Santa Fe. In addition, French Canadian, British, and American fur trappers and traders were afforded greater access to the Southern Rockies and the Southwest. Taos quickly became a base of operations for the trappers, who helped expand the routes into the Southern Rockies and Great Basin that had first been pioneered by Spain in the late eighteenth century (Hafen and Hafen 1993). Those routes eventually became what later was known as the OST. During the trail's heyday in the 1830s and 1840s traders used its braided routes to carry New Mexican blankets and other woolens to California, where they were exchanged for horses and mules.

Jedediah Smith is commonly credited as the first man to traverse the entire trail, although not in a single trip. The first dedicated commercial expedition was made in 1829 by Antonio Armijo and a party of 60 men, who took 86 days to cross the OST's South Route from Abiquiu through southern Utah and northern Arizona (Merlan *et al.* 2011). Most of the caravan traffic subsequently used the Main or North Route that ran northwest from Abiquiu through central Utah and finally across the Mojave to Los Angeles. The North Branch through Taos and into the San Luis Valley was used by some Los Angeles-bound travelers, but primarily remained a fur-trappers trail. The North Branch also connected to the Trapper's or Taos Trail that crossed the Sangre de Cristo Mountains into the Arkansas River basin and skirted the Front Range into the South Platte basin (LeCompte 1978). Caravan traffic on the OST ended in 1848 with the Mexican Cession following Mexico's defeat in the Mexican-American War.

The early nineteenth-century archaeology of Jicarilla Apaches, Utes, and other mobile groups has become an important focus of regional archaeological research (Eiselt 2012). American Indian sites of the period exhibit a complex material culture signature that includes items of indigenous manufacture as well as items of European or American manufacture. Key features of late-eighteenth and nineteenth-century indigenous sites in the Southern Rockies are peeled ponderosa pines and brush shelters known as wickiups. American Indians harvested the inner bark of ponderosa pines and other trees for comestible and medicinal purposes. They also used wood and bark for building materials and for manufacturing a wide variety of tools, containers, and other objects. Scars left by harvesting are readily observable, although unevenly distributed, on both living and dead trees in many parts of the Northern Rio Grande (Corral 1996; Martorano 2011). The largest documented clusters in the San Luis Valley occur in the GRSA and at the Upper Crossing site (Martorano 2011; Mitchell 2012a).

Early American Period (1848 – 1912)

The Treaty of Guadalupe Hidalgo that ended the Mexican-American War also ended the caravan traffic on the OST. Both Santa Fe and Los Angeles became parts of the United States after the war, lessening the economic importance of the OST trade. The nearly simultaneous discovery of gold at Sutter's Mill in California, as well as the arrival of Mormon colonists in the Salt Lake Valley, further altered the economic structure of the West.

However, several important expeditions traversed the North Branch through the San Luis Valley in the early 1850s. Those expeditions were primarily prompted by a search for a practicable trans-continental rail route. Descriptions penned by participants in those U.S.-government sponsored projects provide important information about the nineteenth-century environment and cultural landscape of the San Luis Valley.

The Treaty of Guadalupe Hidalgo also guaranteed the property rights of former Mexican citizens living the in ceded lands. In northern New Mexico and southern Colorado, those rights included ownership of lands granted to individuals and groups by the Spanish crown and later by the Mexican government to encourage settlement. Prior to the war, six Spanish or Mexican land grants extended into what later would become the state of Colorado (Hafen 1927). Several were adjudicated in whole or part. But claims to the Conejos Grant, a colony grant on which the La Botica site is located, were rejected by U.S. courts, even though settlement along the Conejos River and the Rio San Antonio occurred sporadically beginning in 1833 (McCourt 1975).

# 2 Fieldwork and Material Culture

The archaeological field investigation at La Botica occurred between June 3 and June 11, 2018. A total of 20 people, including both professional scientists and avocational volunteers, participated in the project. PCRG Research Director Mark Mitchell supervised the fieldwork. He was assisted by PCRG Research Affiliate Marilyn Martorano, PCRG Operations Director Chris Johnston, and PCRG crew chiefs Britni Rockwell and Talle Hogrefe. PCRG interns included Adams State University students Jordyn McMaster-Neely and Katie Peterson. PCRG volunteers included Kevin Black, Stephanie Boktor, Matthew Fischer, Ann Holloway, Bruce Holloway, Carol Kellison, James Kovats, Larry Scarbrough, Katy Waechter, and Greg Wolff. The crew also included Bureau of Land Management (BLM) archaeologist Marvin Goad and Colorado State Land Board (SLB) Conservation Services Manager Mindy Gottsegen and SLB staff member Savanah Smith. Many of these people also contributed to the environmental and paleoenvironmental field work that occurred in conjunction with the archaeological investigation.

Particle size data on sediment samples taken from soil stratigraphic excavation units were provided by the Kansas Geological Survey, directed by Rolfe Mandel. Rockwell analyzed the flaking debris assemblage, managed the project database, and packaged the collection for long-term curation. Johnston analyzed the chipped stone tools. Martorano analyzed the culturally modified tree data and wrote the description of the collected lead ball. Mitchell created the project GIS, analyzed the pottery sherds, and wrote the balance of the chapter.

2020 *Archaeological Research During 2018 at the La Botica Site, Conejos County, Colorado,* by Mark D. Mitchell, pp. 19-58. Research Contribution 114. Paleocultural Research Group, Broomfield, Colorado.

## Overview of the Fieldwork

Four types of archaeological surface data were collected during 2018, including flaking debris density data, stone tool type data, historical artifact data, and culturally modified tree data. Flaking debris density and tool type data were systematically collected from three survey areas (figure 2.1). The intensive tool survey encompassed 41 20 x 20-m grid blocks or a total of 1.64 ha (4.05 acres). Crews closely inspected these blocks for chipped and ground stone tools, pottery sherds, and cultural features. Grid-level provenience data were collected on 87 non-diagnostic tools. Point provenience data were collected on 10 diagnostic tools.

A point-quarter (P-Q) survey technique, which is described later in the "Field Methods" section, was used to collect data on flaking debris density. Data were obtained from a total of 236 grid points spaced at 10-m intervals. The density survey covered 2.33 ha (5.76 acres).

The crew tallied the contents of a concentration of recent historical artifacts located on the site's southern edge. Data were also collected on isolated historical artifacts located elsewhere on the site.

Seven previously recorded culturally modified trees (CMT) were reexamined and one new CMT was identified and documented.

In addition to these surface data, subsurface data were collected from seven 1 x 1-m excavation squares. Three were placed over possible cultural features located on the south side of the site. The remaining four squares were opened to obtain soil stratigraphic data. Two of the stratigraphic units were

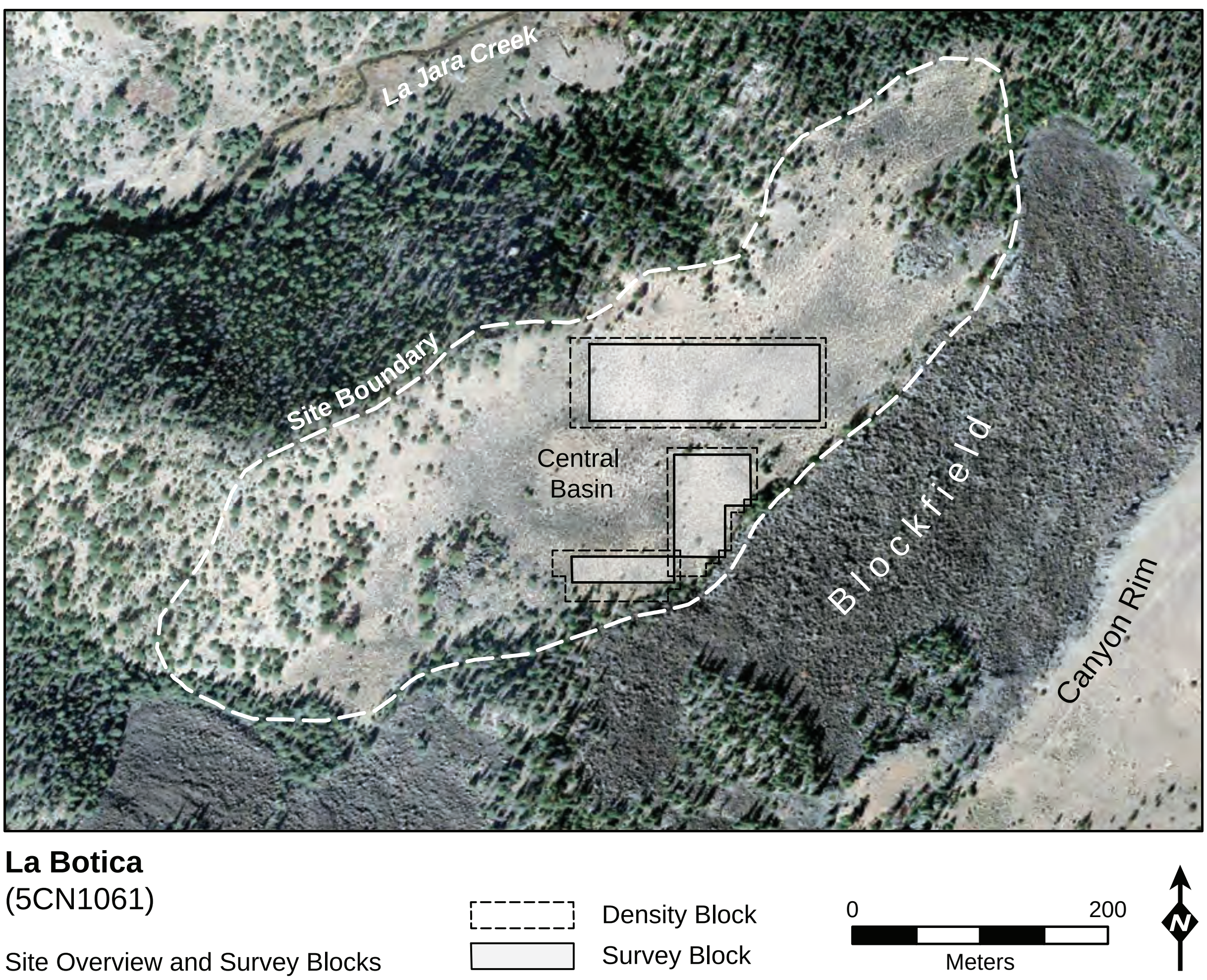



*Figure 2.1. Map of La Botica showing the site boundary and terrain features. The locations of intensive survey areas are also illustrated.*

located on the east end of the site, while two others were located in the hydrologic basin near the center of the site. A small artifact collection consisting of lithic flakes, pottery sherds, and a chipped stone tool was recovered from surface and subsurface contexts in these seven tests.

Outside the excavation units, a total of 29 pottery vessel fragments were collected from the surface under 13 different catalog numbers. No chipped or ground stone tools were collected from the surface outside excavation units. No recent historical artifacts were collected. Artifacts collected in 2018 are permanently housed at the Great Sand Dunes National Park and Preserve curation facility, along with other artifacts previously collected from the site (see appendix A).[1]

## Field Methods

Two provenience control systems were used for the archaeological surveys, test excavations, and geoarchaeological sampling. Spatial data on artifact and feature locations were collected in the UTM system (NAD83 datum) using mapping-grade GPS receivers. The UTM data were post-processed to achieve sub-meter to sub-foot precision. Data on survey block and excavation unit locations were collected with a Berger/CST 205 total station set up on a local northing and easting grid system oriented to true north, which at the time of the fieldwork was 8.6 degrees east of true. An existing brass cadastral survey marker was used as the local primary datum. Three additional local datums, each consisting of a 1½-in aluminum cap set on a 2-ft steel rod, were also established on site (table 2.1). Local grid and UTM data were later integrated in the project GIS, which uses the UTM projection and the NAD1983 datum.

An alphanumeric system was used to designate survey grid blocks and point-quarter (P-Q) data collection points (figure 2.2). For each of the three surface survey areas, the total station was used to locate points at the ends of adjacent baselines and reel tapes were used to locate points along each baseline. Baselines spaced at 10-m intervals were designated by letters and orthogonal grid lines were designated by numbers. Each 20 x 20-m intensive survey block was designated by its alphanumeric center coordinate (figure 2.3). P-Q data collection points occurred at the intersection of each baseline and each orthogonal grid line; they also were designated by an alphanumeric coordinate.

Ground visibility within the survey areas was good to excellent (figure 2.4). Sagebrush (*Artemisia tridentata*) is the dominant plant species within the survey areas. Grasses and forbs mostly are lacking and leaf litter has accumulated only around the bases of larger sagebrush plants. Minor visibility variations occurred among the three survey areas: the best visibility occurred in Block 1, while somewhat more limited ground visibility occurred on the east side of Block 2 and the south side of Block 3. The lowest visibility occurred close to the toe of the blockfield, along the boundary between the sagebrush community and the surrounding mixed conifer community.

### Focused Inventory

Transect spacing within the intensive survey blocks was approximately 1 to 2 m. The survey crews systematically searched each block in turn for chipped and ground stone tools, pottery sherds, and cultural features. Flaking debris was not tallied; instead flake density was measured separately using the P-Q method, which is described later in this section.

Non-diagnostic tools recorded within the blocks included those commonly regarded as lacking defined temporal spans, such as large patterned bifaces, drills, cores, scrapers, handstones, and millingstones. Data

Table 2.1. Spatial data on four site datums.

| | Local Grid | | | UTM (NAD1983, Zone 13N) | | | |
|---|---|---|---|---|---|---|---|
| Datum No. | Northing | Easting | Elevation | Northing | Easting | Azimuth | From Datum |
| 1 (Brass Cap) | 1000.000 | 2000.000 | 100.000 | [Redacted] | | - | - |
| 2 | 1026.052 | 1933.869 | 96.545 | | | 291°30’00” | 1[a] |
| 3 | 882.250 | 1860.516 | 99.850 | | | 207°00’50” | 2[b] |
| 4 | 926.975 | 1769.541 | 94.509 | | | 296°10’45” | 3[b] |

[a] True north azimuth measured with a tripod-mounted Brunton Pocket Transit.
[b] Calculated azimuth.

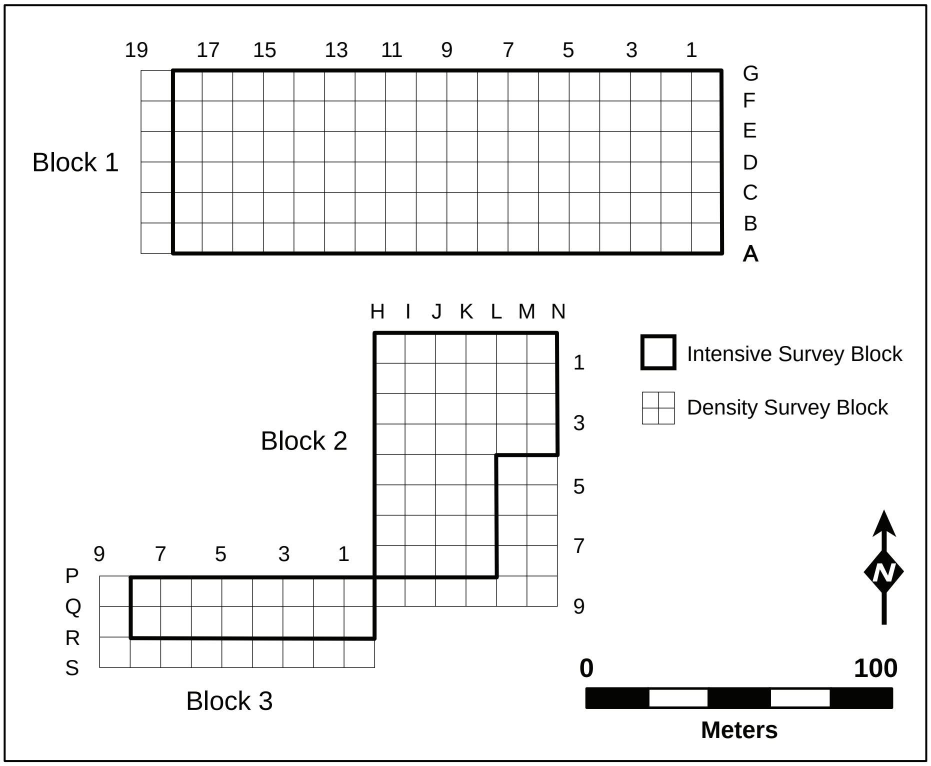



*Figure 2.2. Schematic map showing the alphanumeric grid system employed for each of the three survey blocks.*

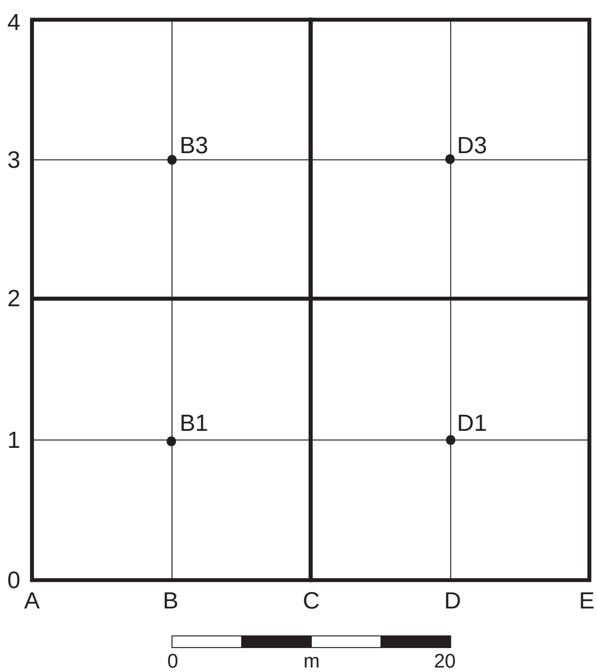



*Figure 2.3. Diagram illustrating the system for designating intensive survey blocks and artifact density collection points. Refer to figure 2.2 for the layout of the La Botica survey blocks.*

collected on non-diagnostic tools included artifact type, size, material, and evidence of burning along with a brief description. Non-diagnostic tools were tallied by survey block; precise UTM data were not collected on non-diagnostic specimens. Data collected on artifacts with temporally diagnostic attributes include type, raw material, a narrative description, and relevant measurements. Photographs were taken of each diagnostic stone tool or pottery vessel fragment and precise UTM data were collected. Several of the documented diagnostic tools were located outside the intensive survey areas.

Conservative criteria were used to identify ground stone tools. Unmodified alluvial cobbles occur across the site, many of which may have been entrained in the extrusive volcanic formations that make up the cliffs bordering the site. The primary criterion for the identification of ground stone tools was visible use-wear, which commonly consists of linear striations on grinding facets. Ground stone tools also exhibit differential surface characteristics: the surface attributes of grinding facets differ from the surface attributes of adjacent unmodified portions of the tools. Grinding surfaces may also exhibit intentional pecking. Alluvial cobbles lacking these defining attributes were regarded as unmodified cobbles.

*Figure 2.4. Photograph showing typical ground visibility within the survey blocks.*

Point-Quarter Density Survey

The P-Q method is designed to objectively quantify surface artifact density. The approach was first developed for ecological applications but also has been effectively applied to archaeological cases (e.g. Ahler *et al*. 1979). The method is based on the fact that density is a function of the mean distances between objects, where density is the inverse of the squared mean distance among them. P-Q data consist of measured distances between a designated data collection point and artifacts in each of four adjoining quadrants. At La Botica, quadrants were defined by two 10-m ropes, both centered on an alphanumeric data collection point and oriented to the site grid at right angles (figure 2.5). Distances were measured from each data collection point to the nearest chipped stone flake in each of the four 5 x 5-m quadrants defined by the two 10-m ropes (figure 2.6). The mean of those distances ($D_m$) was used to calculate the flake density (D) of the 10 x 10-m block centered on the data collection point (equations 1 and 2).

Equation 1 $$D_m = \frac{(d_1+d_2+d_3+d_4)}{4}$$

Equation 2 $$D = \frac{1}{{D_m}^2}$$

If no flakes were identified in a quadrant, the maximum distance between the collection point and the opposite corner of the quadrant (√50 or 7.07 m) was recorded.

Historical Artifact and Culturally Modified Tree Surveys

Basic descriptive data were collected on all observed historical artifacts. The majority of the documented recent historical specimens occurred in one of two clusters, including a larger cluster on the south side of the site close to the toe slope of the talus field and a smaller cluster on the north side adjacent to a prominent rock outcrop. UTM data were collected on

*Figure 2.5. Photograph of the P-Q data collection process. (Photo courtesy of Bruce Holloway.)*

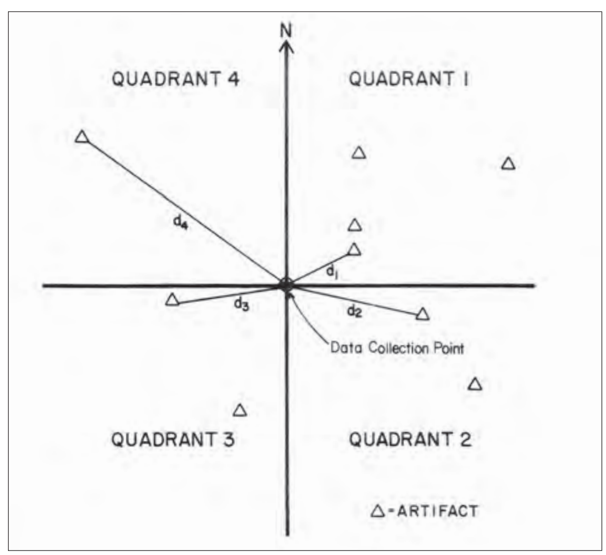




*Figure 2.6. Diagram illustrating the P-Q data collection method (from Ahler* et al. *1979:Figure 3).*

the perimeters of these clusters but not on individual specimens.

Each of the seven previously recorded CMTs was reexamined and existing records were evaluated for completeness and accuracy. Additional data were collected on selected CMTs. A lead ball was observed embedded in one previously recorded CMT and was extracted for additional analysis. All of the older ponderosa pines within the site boundary were systematically examined for cultural modification. One additional CMT was identified and documented.

### Subsurface Testing

All test units were 1 x 1-m in size. The total station was used to set two corners each of Units 2, 3, 5, 6, and 7. The remaining two sides of these units were set by triangulation. All four corners of Units 1 and 4 were set by compass and triangulation and the positions of their southwest corners were subsequently measured with the total station. Vertical control within each unit was provided by a datum string tied to one of the corner nails. All excavation depths were measured from strings attached to the nails. Excavation depths determined from corner nails in this manner were recorded as surface depths (SD).

PCRG excavation methods distinguish between general levels (GL), which include all materials recovered from each excavation level within a test unit, and feature levels (FL), which only include material from a defined and numbered cultural feature. Excavation levels varied in thickness. The target depth of the first general level in each unit is determined by the slope of modern ground surface. After the first level, each unit was commonly excavated in arbitrary 10-cm thick levels and dry screened over ¼-in mesh hardware cloth. Potential feature fill lots were screened over ⅛-in hardware cloth. A single bulk feature sediment sample was returned to the PCRG lab for floatation. Units 2 and 3, both of which were opened to expose soil horizons and depositional strata within the site's central basin, were excavated in 20-cm thick levels. Sediment from the deepest portions of these units were not screened, as described later in the chapter.

Excavation was primarily carried out with trowels and other small hand tools. Excavated sediment was transferred to 5-gallon plastic buckets and transported to screening areas positioned near each excavation unit. Excavation data were recorded on pre-printed level forms. In addition to basic provenience data, the forms include spaces for excavators to write short narratives describing the sediment and artifacts observed and to discuss problems or unusual situations encountered during excavation of each GL or FL. Excavators drew plan maps of the base of each level and photographs were taken of the bases of representative levels as well as of the work in progress. At least one profile was drawn and photographed for each excavation unit. An on-site provenience- and recovery-based field catalog was maintained (appendix A). Catalog numbers were assigned to each arbitrary level when excavation began, and all objects recovered during screening of that level were grouped under that number. Individual catalog numbers were also assigned to each piece-plotted artifact. All excavation units were backfilled at the end of the project.

## Survey Results

### Point-Quarter Density Survey

Figure 2.7 illustrates the results of the P-Q density survey. For clarity, the survey blocks are shown schematically; refer to figure 2.1 for the locations of the density survey blocks within the overall site boundary. Each cell in figure 2.7 represents a 10 x 10-m (100 $m^2$) area centered on an alphanumeric data collection point. Data were collected at 236 points; however, owing to irregularities in the perimeters of Blocks 2 and 3, the P-Q survey area included a total of 233 10 x 10-m cells (2.33 ha or 5.76 acres).

The five gray tones in figure 2.7 represent calculated density values expressed as flakes/$m^2$. Among the 233 cells, six contained no flakes, while 23 contained more than 2 flakes/$m^2$. Most cells contained between 0 and 0.5 flakes/$m^2$. The cell with the highest density contained 14.3 flakes/$m^2$. Based on these data, the 233 cells in the density survey areas contain an estimated 19,300 flakes or an aggregate mean of 0.83 flakes/$m^2$. If the highest-density cell is removed, the aggregate mean drops slightly to 0.77 flakes/$m^2$, or an estimated 17,900 flakes within the survey area. Figure 2.8 illustrates the distribution of flake densities.

The density data reveal several artifact concentrations within the surveyed area. The largest of these, both in terms of extent and density, occurs on the west side of Block 1. Three smaller and less dense concentrations occur on the east side of Block 1, on the north side of Block 2, and on the south side of Block 2 and the east side of Block 3.

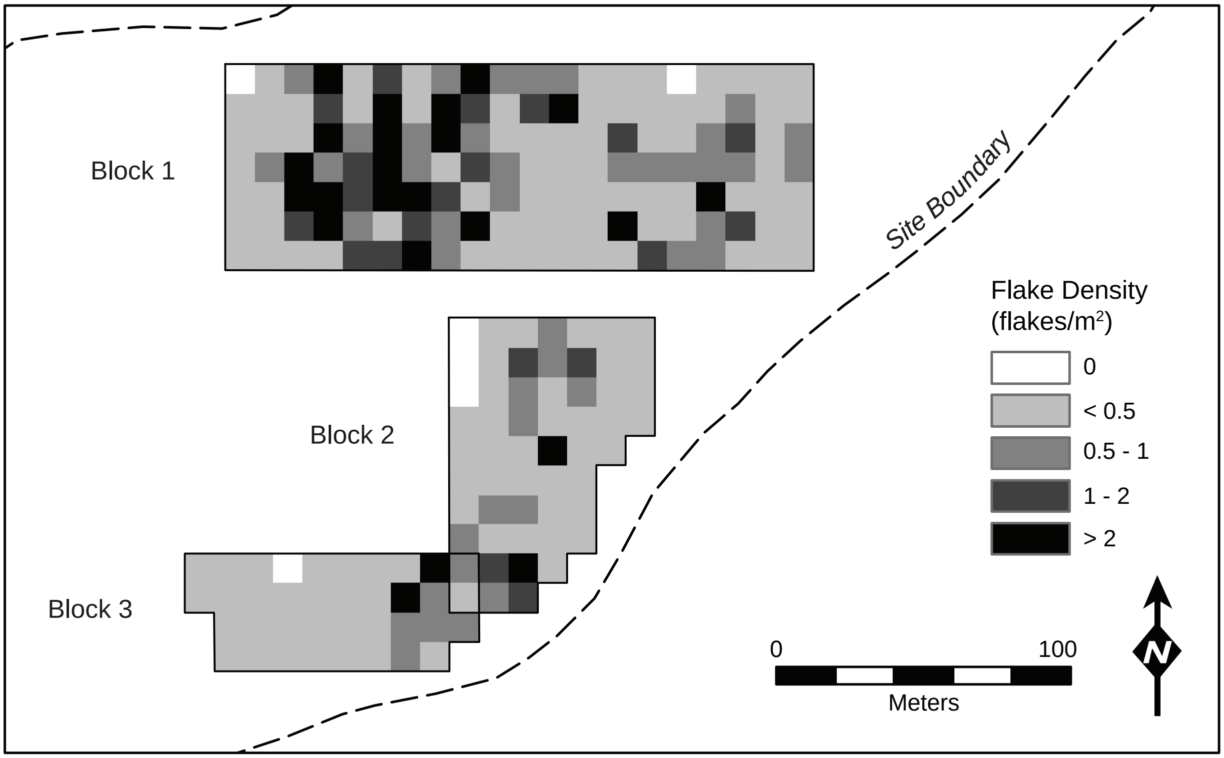



*Figure 2.7. Map showing the results of the P-Q density survey. Each cell represents a 10 x 10-m area; refer to figure 2.1 for the locations of the survey blocks within the site.*

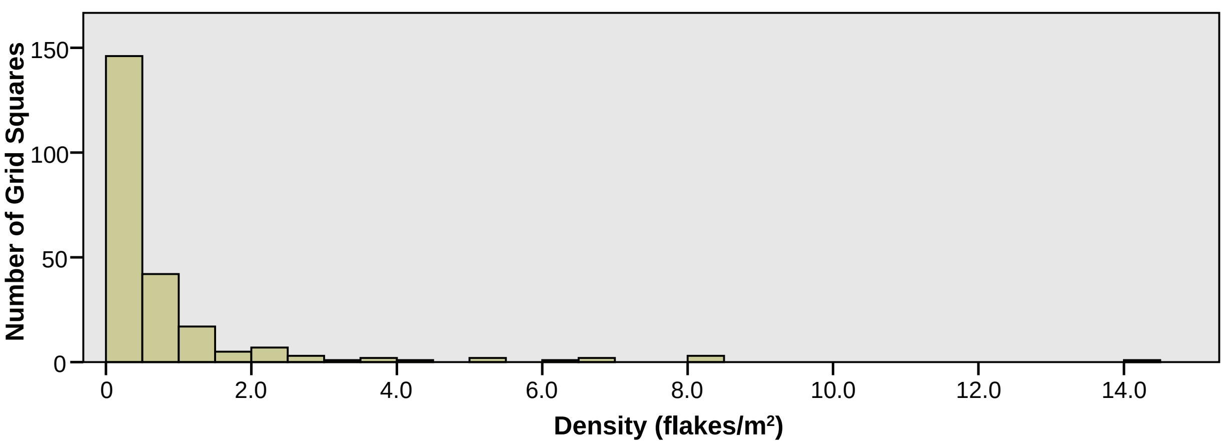
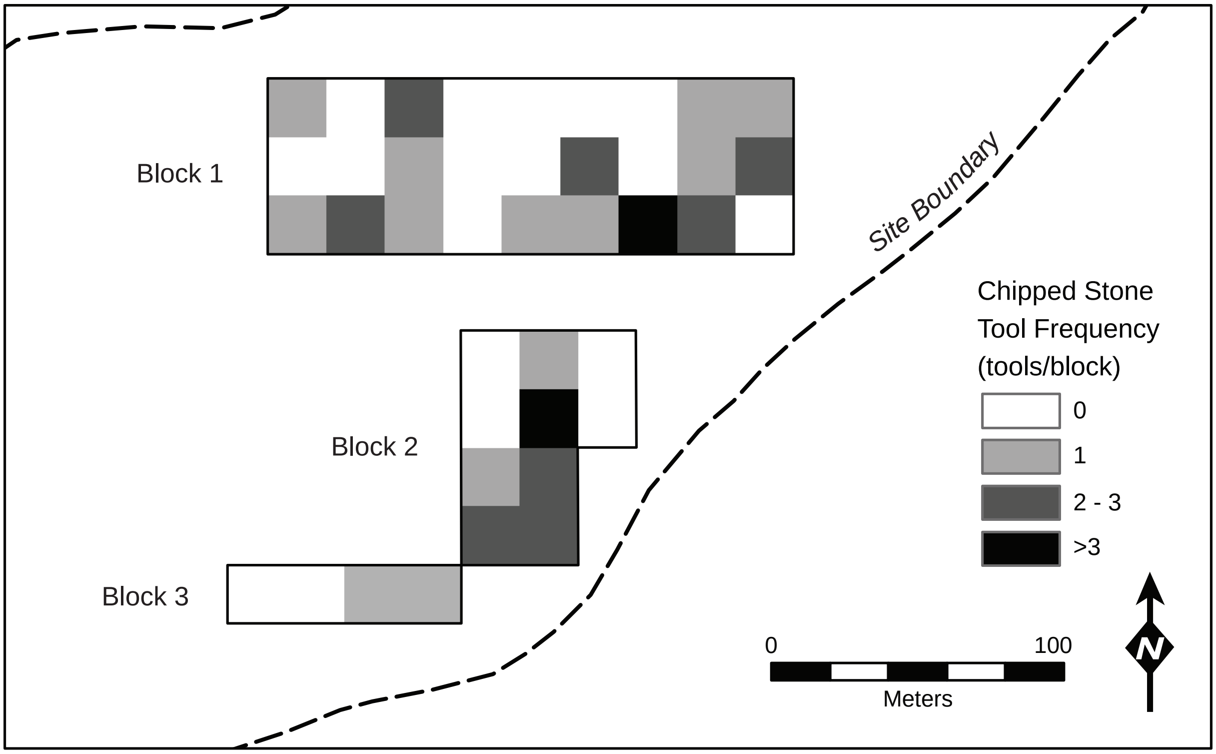



*Figure 2.8. Histogram showing the distribution of flake densities among 233 survey grid squares.*

The three smaller concentrations occur along the toe of the talus field, roughly conterminous with the area where late Holocene sediment is best preserved. By contrast, the large concentration on the west side of Block 1 occurs in an eroded portion of the site, immediately north of the central depression. Surface geomorphology is described more later in the chapter.

Focused Inventory

The distributions of chipped and ground stone tools exhibit both similarities and differences with the distribution of flakes. Figure 2.9 illustrates the results of the intensive survey; refer to figure 2.1 for the locations of survey blocks within the site. Each cell in figure 2.9 is measures 20 x 20-m (400 m²), an area four



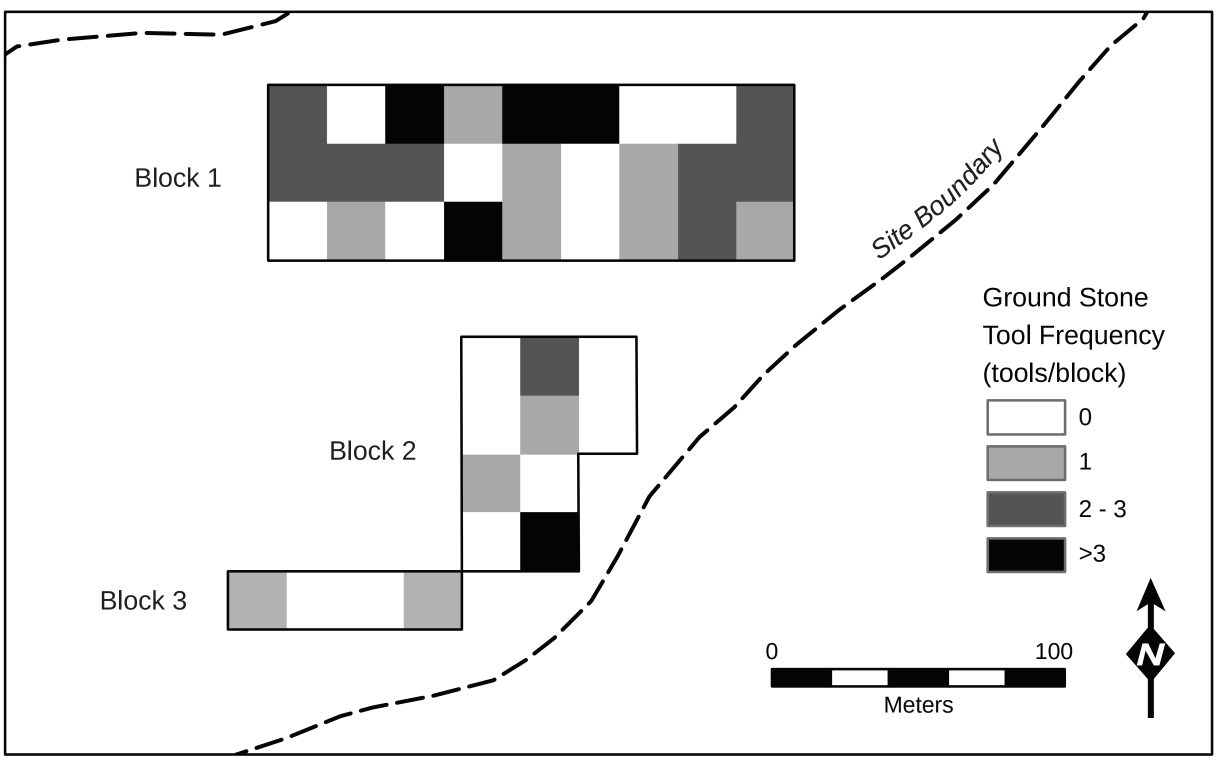




*Figure 2.9. Maps showing the distributions of ground (lower panel) and chipped (upper panel) stone tools within the survey blocks. Each cell represents a 20 x 20-m area. The locations of the survey blocks within the site are shown in figure 2.1.*

times that of the density survey cells. The lower panel of the figure shows the distribution of 59 ground stone tools, while the upper panel shows the distribution of 39 chipped stone tools. Illustrated tool frequencies include the number of non-diagnostic chipped and ground stone tools identified during the 2018 survey, the number of projectile points identified and plotted in 2018, and the number of chipped stone tools (including projectile points) plotted during the 2009 Fort Lewis College survey. Few ground stone tools were plotted in 2009 and those that were occurred outside the boundaries of the 2018 survey area.

No tools were identified in eight of the 41 survey cells. Sixteen cells contained no ground stone tools, while 18 contained no chipped stone tools. The largest number of tools in a single cell is nine and the mean is 2.4 tools/cell. Figure 2.10 illustrates the frequency distributions of chipped and ground stone tools.

Sixty percent of the tool assemblage consists of ground stone specimens, yielding a mean density of 1.4 tools/block. The density of chipped stone tools is 1.0 tools/block. Differences exist between the distributions of ground and chipped stone tools. The ground stone tool distribution is similar to the flake distribution: the largest concentration occurs on the west side of Block 1 and smaller concentrations occur closer to the foot of the talus field. By contrast, chipped stone tools are moderately more common in the area of the three smaller flake concentrations near the toe of the talus field. These differences, though minor, may reflect spatial variations in assemblage function. The technological attributes of the documented tool assemblage are discussed in chapter 3.

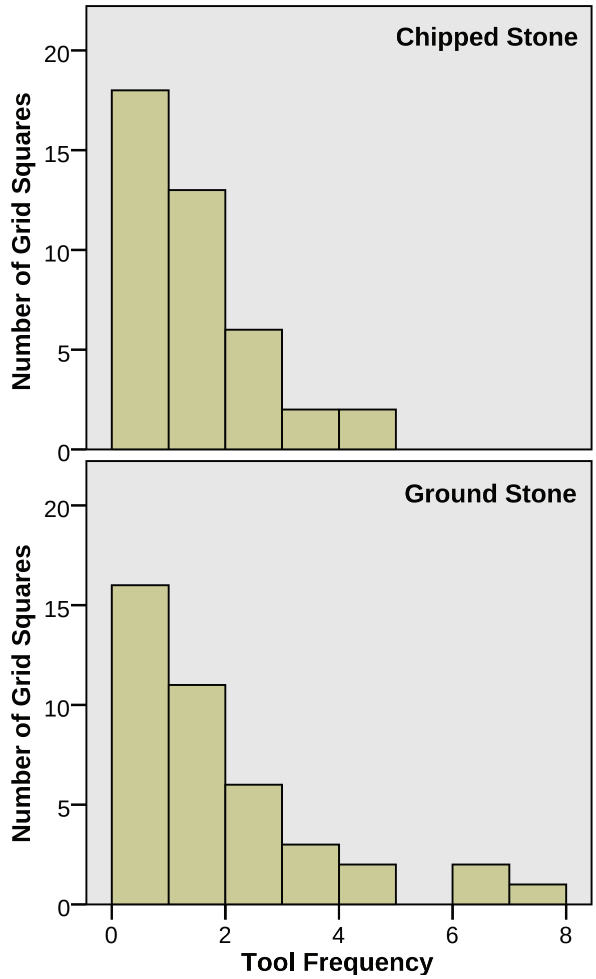



*Figure 2.10. Histogram showing the frequency distributions of chipped (upper panel) and ground (lower panel) stone tools among the 41 grid squares.*

Stronger contrasts are evident in the distributions of projectile points and pottery sherds. Figure 2.11 illustrates those distributions, both inside and outside the survey blocks. Illustrated specimens include those plotted in 2018 as well as those plotted in 2009. The distribution of projectile points, shown in the upper panel, encompasses most of the surveyed areas, including along the toe of the talus slope and in the eroded area north of the central depression. By contrast, the distribution of pottery sherds, shown in the lower panel, is confined to the portions of the site close to the toe of the talus. However, dart points, which predate the production of pottery, are more common in Block 1, while arrow points are more common along the toe of the talus field, where the pottery sherds are also found.

These distributions suggest that Archaic groups—who manufactured dart points but did not use ceramic technology—occupied the entire site area, while Late Prehistoric groups—who manufactured both arrow points and pottery—focused their use of the site on the edges closest to the blockfield. The distributions further suggest that the large concentration of flaking debris and ground stone tools on the west end of Block 1 dates primarily or exclusively to the Archaic period, and, moreover, that the possible spatial variation in assemblage function identified in the survey block data in fact reflects temporal change in site use.

One hearth and five possible hearths were identified within the survey areas (figure 2.12). In addition, the survey crews observed two concentrations of burned earth not associated with burned rocks, charcoal-stained sediment, or artifacts.

**Feature 5**, which was located in survey grid B13 in the southwest portion of Block 1, consisted of

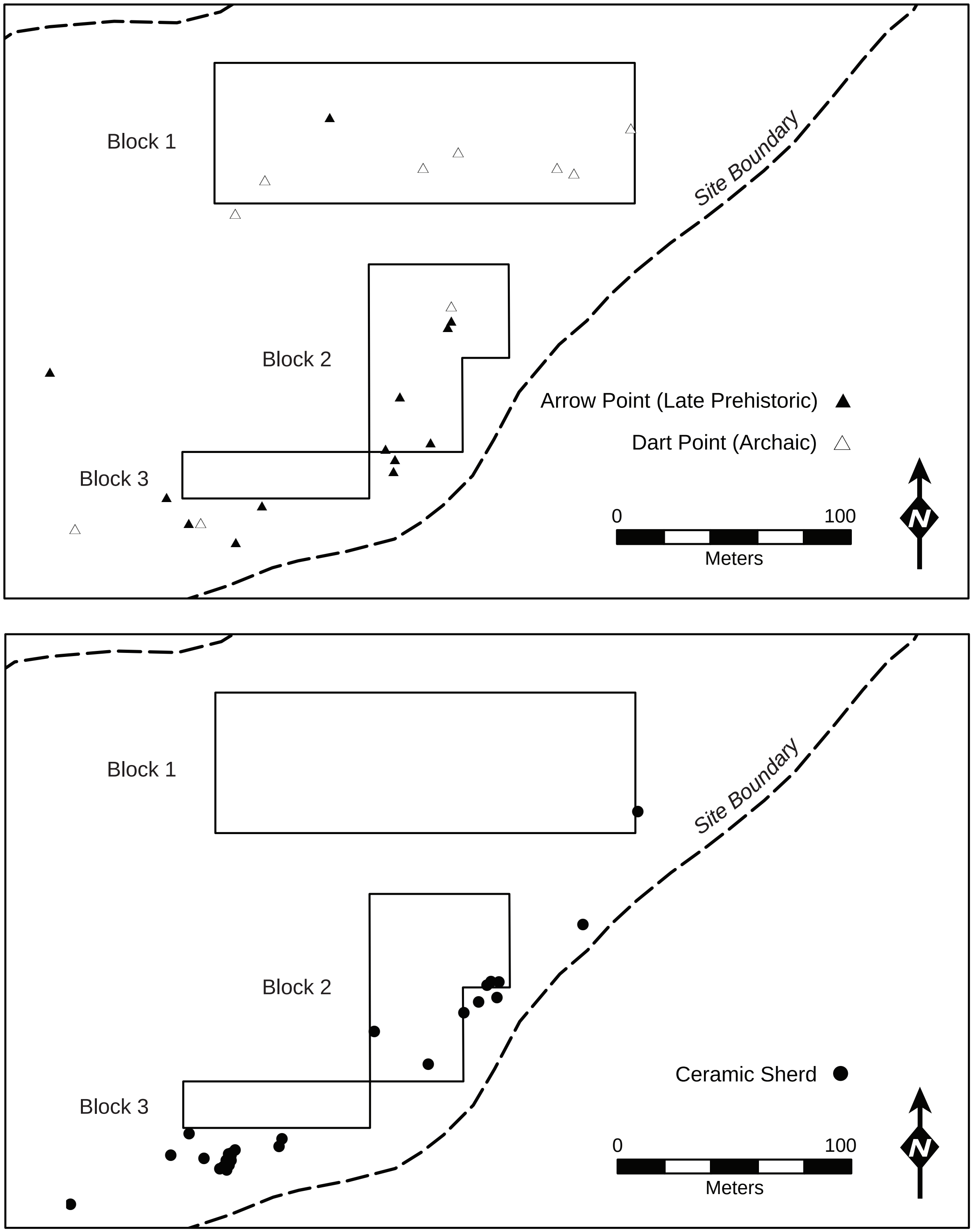



*Figure 2.11. Maps showing the distributions of projectile points (upper panel) and pottery sherds (lower panel). The locations of the survey blocks are illustrated in figure 2.1.*

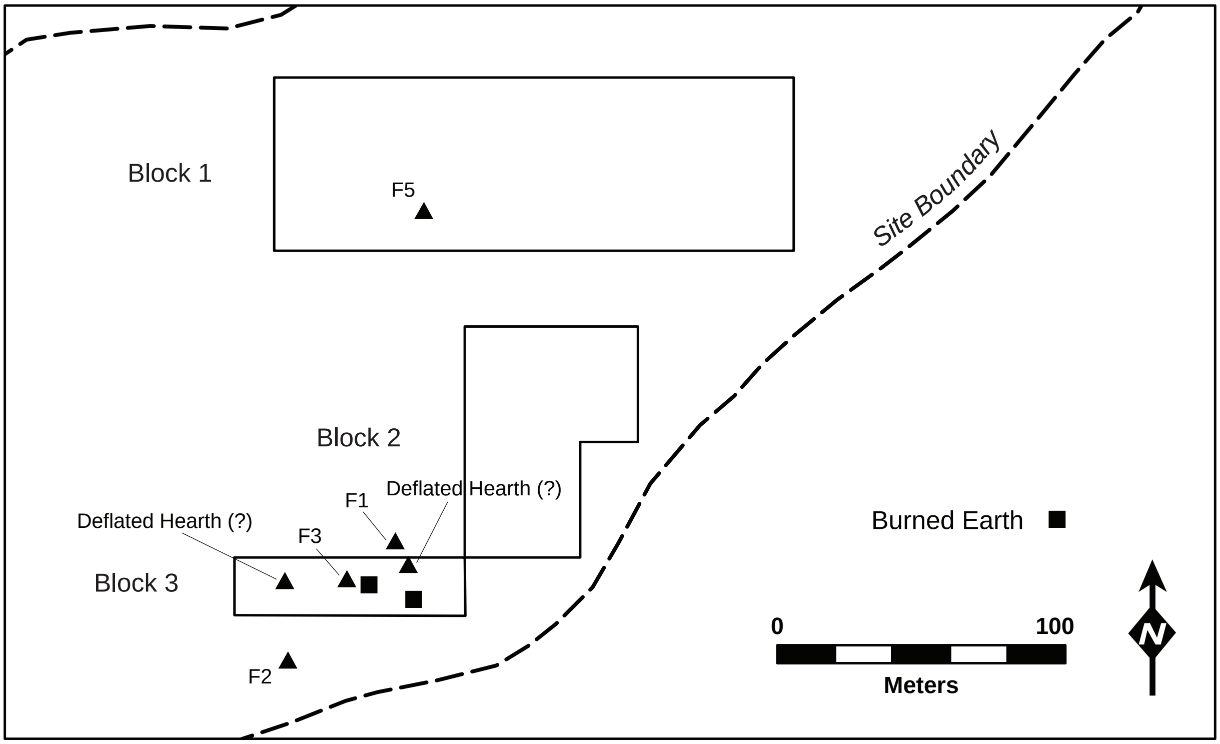



*Figure 2.12. Map showing the distribution of features and possible hearths documented in 2018.*

approximately 60 quartz latite and basalt cobbles ranging in maximum dimension from 1 to 18 cm (figure 2.13). Two cobbles exhibited definite evidence of burning. Eleven lithic flakes were associated with the cobble scatter, including one obsidian flake, two Cumbres chert flakes, and eight basalt flakes. A fragment of recently shed antler was also located on the surface near the feature. The hearth, which measured 2.3 m east-west by 1.25 m north-south, has been heavily disturbed by sheetwash erosion and possibly by trampling. About one-third of the stones comprising the feature have been transported downslope to the southwest. The hearth may have originally been circular in plan and roughly 1 m in diameter. All of the fill has been removed by erosion.

*Figure 2.13. Photograph of Feature 5. The tape measure is oriented east-west and is 1 m in length.*

Five possible hearths were identified in and adjacent to Block 3. Two consisted of cobble concentrations, labeled "deflated hearths" in figure 2.12. Cobbles ranged in maximum dimension from 5 to 15 cm (figure 2.14). The larger of the two concentrations measured 2.3 m east-west by 1.9 m north-south. Lithic flakes and burned bone occurred on the surface nearby. The smaller feature measured 1 m east-west by 66 cm north-south. No artifacts were observed in the vicinity.

The remaining three possible hearths (Features 1 through 3) consisted of concentrations of burned earth and charcoal-stained sediment. One of the three was associated with lithic flakes and a pottery sherd. These possible features are described in the "Feature Excavation" section later in the chapter. That section also provides additional data and discussion on possible features observed elsewhere on the site.

Figure 2.14. Photographs of two possible deflated hearth features. Locations of the features are shown in figure 2.12. The tape measure is pulled to 1 m in each photograph.

Figure 2.15. Photograph of a "collector's pile" noted on the site. (Photo courtesy of Kevin Black.)

Isolated fragments of burned or calcined mammal bone were observed in Block 1 (survey grid F1) and just east of Block 2. Neither was associated with a cultural feature.

The crews also noted the presence of at least four lithic flake concentrations interpreted as "collectors piles" (figure 2.15). These concentrations likely reflect recent recreational activity at the site.

### Recent Historical Artifact Inventory

A small assemblage of recent metal artifacts is present at La Botica (table 2.2). Nearly all of the documented specimens occur in a single concentration, designated **Feature 4**, that is located on the site's south side (figure 2.1). (Feature 4 is slightly larger than, but substantially equivalent to, Fort Lewis College's Feature 39 [Crosser *et al.* 2009].) The Feature 4 assemblage primarily consists of sanitary food cans, tobacco cans, sardine cans, and miscellaneous manufactured and handmade camp equipment. Manufactured camp equipment includes a probable coffee pot lid (listed as a "friction lid with loop handle" in table 2.2) and a detached strap handle, possibly from the same coffee pot. Handmade camp equipment includes a funnel and baling wire loops.

Apart from a single aluminum pull tab, most of the cans date to the early twentieth century. Sanitary cans, the most abundant type, were widely available after 1904. The cut can lid embossed with the word "Sanitary" likely was manufactured between 1904 and 1908, although a few such cans may have been produced after World War I (Rock 1989:65, 198). The can fragment with a soldered seam could date to the 1890s, while the sardine cans could have been produced after World War I or later. Tobacco tins with hinged lids were first produced in 1907.

Three historical metal artifacts were observed elsewhere on site: a sheet-metal stove located close to the prominent rock outcrop just west of the central basin; a fragment of a horseshoe located about 20 m southeast of the stove; and a soldered can located on the site's west end. The stove was manufactured from thin sheet metal and included a pipe vent and two doors with wire hinges. No other artifacts were associated with the stove. The horseshoe fragment was located near a natural alcove in the bedrock and was associated with a recent stacked-rock fire ring; a 1.5-m long stacked-rock wall consisting of four

Table 2.2. Inventory of recent metal artifacts. Upper panel lists artifacts observed within Feature 4; lower panel lists artifacts observed in other parts of the site.

| | Dimensions (in) | | |
|---|---|---|---|
| Description | Height | Width or Diameter | Count |
| Sanitary can | 4 3/8 | 3 | 5 |
| Sanitary can | 3-15/16 | ~3 | 1 |
| Sanitary can | 3 ½ | 2 1/8 | 2 |
| Sanitary can | 4 | 2 5/8 | 1 |
| Soldered can fragment | 4 3/8 | 3 | 1 |
| Evaporated milk can | 4 | 3 | 4 |
| Tobacco can, hinged lid, "Red Velvet" brand | | | 1 |
| Sardine can | | | 5 |
| Sardine can lid | | | 3 |
| Chewing tobacco can | | 2 ½ | 3 |
| Chewing tobacco can lid | | 2 ½ | 2 |
| Can lid embossed with "Sanitary" | | 2 3/8 | 1 |
| Friction lid with raised ring and loop handle | | 3 ½ | 1 |
| Baling wire, looped and twisted | | | 4 |
| Strap handle | ~7 | Tapering: 1 3/8 wide to 5/8 wide | 1 |
| Funnel, handmade from cut can fragment | 2 7/8 | 2 (wide end) | 1 |
| Pull tab, aluminum | | | 1 |
| Total | | | 37 |

| | Dimensions (in) | | | |
|---|---|---|---|---|
| Description | Length or Height | Width or Diameter | Depth | Count |
| Sheet-metal stove | ~11 | 20 | 11 | 1 |
| Soldered can | 5 ¾ | ~4 | | 1 |
| Horseshoe fragment | | | | 1 |
| Beverage can, aluminum | | | | 1 |
| Beverage bottle, plastic | | | | 1 |
| Total | | | | 5 |

courses of stones; two "collectors piles" containing 21 and 25 chipped stone artifacts, respectively; and recent aluminum and plastic beverage bottles.

These data indicate only limited use of the site for habitation during the twentieth century. The number, distribution, and ages of the Feature 4 artifacts suggests a single early twentieth-century occupation, possibly by sheep herders. The fact that the sheet-metal stove was not associated with other artifacts suggests that it may have been transported from another location, possibly from Feature 4. The remaining artifacts reflect one or more brief late twentieth-century or early twenty-first century occupations, possibly by recreational hunters.

## Culturally Modified Tree Inventory

When La Botica was first recorded in 2005 several culturally modified trees (CMTs) were observed but not formally documented. A subsequent Fort Lewis College survey and recordation in 2009 identified and documented five CMTs. However, Fort Lewis's Colorado Cultural Resource Survey forms for the site note that "some of these trees may not have been modified but scars could be natural, or they could possess a combination of both cultural and natural modification" (Crosser *et al.* 2009).

A BLM archaeological monitoring crew identified two additional modified trees (CMT6 and CMT7) at the site in 2017. However, forms documenting their observations have not been submitted to the Office of Archaeology and Historic Preservation.

During the 2018 fieldwork, PCRG crews revisited and reevaluated each of the seven previously documented CMTs. The crews also identified and documented an additional cambium tree (CMT8).

PCRG's field investigation determined that four of the previously recorded CMTs are not culturally modified. However, for the sake of clarity the original numbering system has been retained. Table 2.3 summarizes PCRG's results along with those of prior field projects. The locations of four culturally modified trees are shown in figure 2.16. Trees lacking cultural modification are omitted from figure 2.16 and from the following descriptions.

**CMT2** was first documented in 2009. The original recording identifies three separate scars. The first consists of a tall, narrow, burned scar face. The second consists of an adjacent unburned scar that intersects the first on the latter's left side. The third scar consists of two contemporaneous axe-cut faces near the base of the first scar. Three dendrochronological samples were taken, two of which produced injury dates of 1774 and 1834. The locations of the dated cores are not indicated on the form and so the relationships between the dates and the scars are unknown.

The 2018 field crew determined that Scars 1 and 2 likely represent a single fire scar. The scar exhibits the typical morphology of a "cat face" fire scar produced by a surface burn: a triangular injury that begins at the ground surface and tapers evenly to a narrow or pointed termination (figure 2.17). The axe-cut faces reflect subsequent cultural modification of the fire scar, perhaps for the harvest of pitch-infused "fatwood." Slivers or chunks of such fatwood commonly were used as fire starter.

**CMT4** was first documented in 2009. The original recording describes three separate scars. Scar 1 was interpreted as a small "test scar" and the oldest of the three. It exhibits three axe cuts and a partially detached branch or "board." Scar 2 was interpreted as a cambium peel that subsequently was modified by axe cutting. Scar 3 lacks axe marks and begins at the ground surface. Dendrochronological samples were not collected from CMT4.

PCRG's crew determined that Scar 1 was produced by axe cutting, possibly to obtain fatwood. The partially detached wood fragment was produced during the initial removal attempt. Scar 2 represents a cambium peel that was subsequently axe cut, also likely for fatwood (figure 2.18). A possible tool mark occurs on the upper end of the scar. Scar 3 exhibits

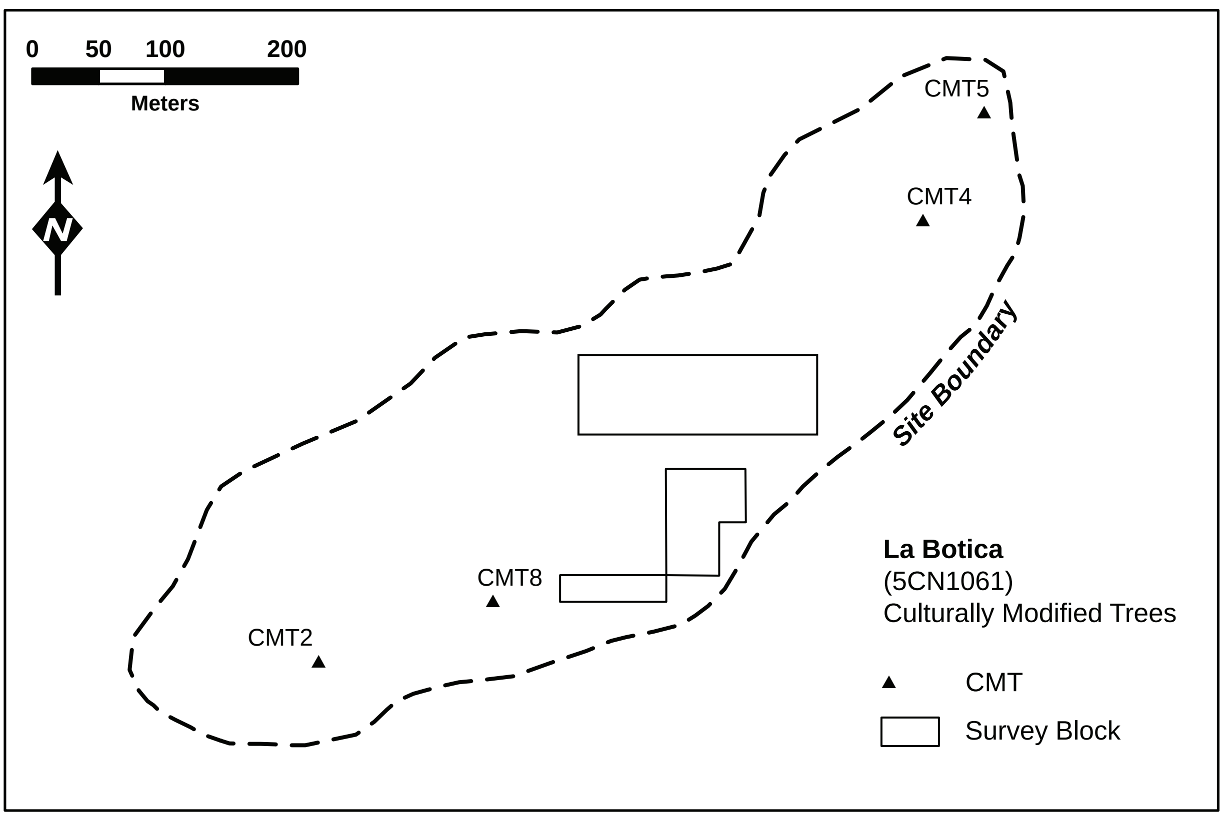



*Figure 2.16. Map showing the distribution of culturally modified trees. The illustrated trees are highlighted in table 2.3.*

Table 2.3. Culturally modified tree (CMT) data. CMTs shown in figure 2.16 are indicated by shading. The unshaded rows represent trees altered by natural rather than cultural processes; the locations of these unmodified trees are not shown in figure 2.16.

| CMT Number | 2009 Fort Lewis Interpretation | 2017 BLM Interpretation | 2018 PCRG Interpretation |
|---|---|---|---|
| CMT1 | Scarred tree | [none] | Fire scar |
| CMT2 | Scarred tree (3 scars) | [none] | Modified fire scar |
| CMT3 | Scarred tree | [none] | Lightning scar |
| CMT4 | Scarred tree with axe cuts (3 scars) | [none] | Axe-cut scar; cambium peel with axe cuts (2 scars) |
| CMT5 | Scarred tree | [none] | Cambium peel with axe cuts |
| CMT6 | [none] | Cambium peel | Natural bark removal |
| CMT7 | [none] | Modified limb | Mistletoe infestation |
| CMT8 | [none] | [none] | Cambium peel |

the typical characteristics of a "cat face" fire scar and therefore does not represent cultural modification of the tree.

**CMT5** was first documented in 2009. The single scar was interpreted as primarily a product of axe cutting, rather than cambium peeling. No dendrochronological samples were taken in 2009.

CMT5 is a large diameter ponderosa pine located near the north end of the site. Most of the scar surface was chopped up with an ax, likely to remove the pitchy wood for use as fire-starter. Because most of the original scar surface is not extant, it is difficult to determine whether the scar was created by peeling prior to the chopping or by a ground fire or lightning scar. The scar could have also been originally created by peeling and then was burned at a later time. The bole of the tree has been struck by lightning; a crease in the bark representing the grown-over lightning scar extends upward from the top of the scar**.** Burning on the scar face may have occurred contemporaneously with the lightning strike or the burning may have been caused by a later ground fire.

*Figure 2.17. Photograph of CMT 2 showing the fire scar and subsequent fatwood removal. (Photo courtesy of Marilyn Martorano.)*

*Figure 2.18. Photograph of CMT 4 showing multiple axe cuts on the scar face. (Photo courtesy of Marilyn Martorano.)*

Nevertheless, the scar base height above the current ground level, combined with the lack of significant evidence of burning near the base of the scar or the scar edges, suggests that the tree may have been culturally peeled prior to the burning.

A lead ball was observed in the scar face (figure 2.19). Wood around the ball was fragmented, likely due to the ball's impact. The ball was extracted for additional analysis, the results of which are presented later in this chapter.


*Figure 2.19. Photograph of CMT 5 showing axe cuts and the lead ball embedded in the scar face. (Photo courtesy of Marilyn Martorano.)*

**CMT8** was first documented in 2018. The feature consists of a very large cambium peel on a dead-and-down ponderosa pine (figure 2.20). The peeled face is approximately 93 cm wide and 140 cm long. Numerous axe cuts are visible on and adjacent to the peel surface. The scar face, which now faces down and to the north, shows two cut marks that likely represent the initial peeling cut. Subsequent cut marks on the scar face may be related to wood removal. One narrow strip of wood, measuring 6 cm wide, 47 cm long, and up to about 2.5 cm deep, appears to have removed on the one side of the scar. The very large scar removal on this tree may have caused trauma to the tree and potentially hastened its death, as evidenced by the limited wound wood growth at the scar edges, indicating that the tree did not live many years following the peeling event.

**Excavation Results**

Subsurface testing at La Botica was undertaken with two goals in mind. The first was to learn more about the geomorphic processes affecting the site's archaeological deposits. The second goal was to investigate the age, function, stratigraphic context, and condition of subsurface or near-surface cultural features. Four of the seven excavation squares opened in 2018 were positioned to address the former goal, while three were positioned to address the latter. Table 2.4 summarizes data on each of the seven excavation squares, which are illustrated in figure 2.21.

Soil Stratigraphic Excavations

Four excavation squares were opened to investigate the site's surface geomorphology and depositional history. The positions of these four squares were based on a preliminary in-field analysis of depositional processes, rather than on the distribution of surface artifacts. Two excavation squares (Units 2 and 3) were placed in the central depositional basin located immediately west of Block 2. Two other squares (Units 1 and 4) were placed on the east side of the site. Unit 1 was placed in a portion of the site exhibiting moderate surface erosion, while Unit 4 was placed in an uneroded portion of the site.

*Unit 4*

Unit 4 was placed on the site's eastern edge, roughly 10 m beyond the toe of the blockfield, in an area that based on surface data appeared to have been mostly unaffected by Holocene sheetwash erosion. A healthy sage and bunch grass community surrounded the excavation square and leaf litter covered much of the surface. Excavation of four general levels to a depth of 40 cm confirmed that the soil-stratigraphic sequence is essentially intact in that portion of the site.

Four soil horizons were exposed in Unit 4 (table 2.5; figures 2.22 and 2.23). The upper 18 cm consisted of the modern A horizon. Beneath the A horizon was an approximately 7-cm-thick AB horizon that contained numerous burrows. The lowest two soil horizons consisted of Bt horizons; the upper was 11 cm thick and the lower was more than 4 cm thick.

Unit 4 also yielded archaeological data (table 2.6). A layer of burned and unburned stones was encountered in GL2 and GL3, between about 15 and 31 cm SD; the majority occurred between about

*Figure 2.20. Photograph of CMT 8. Project participant Kevin Black provides scale. (Photo courtesy of Marilyn Martorano.)*

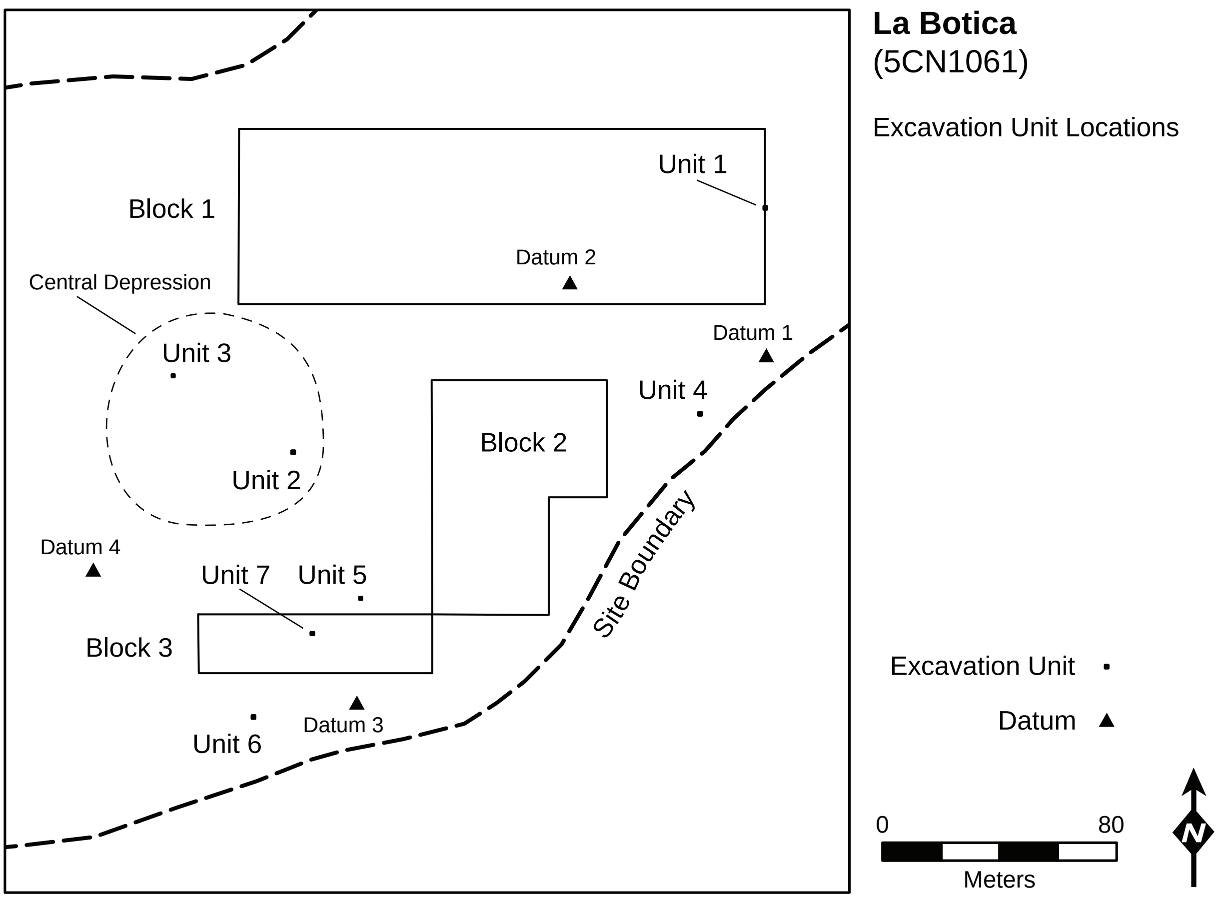



*Figure 2.21. Map showing the locations of the seven test excavation units. Also shown are the locations of four permanent site datums and the locations of the three survey blocks.*

Table 2.4. Test excavation unit data.

| | | SW Corner Coordinates | | | |
|---|---|---|---|---|---|
| Unit Type | Unit Number | Local | UTM (NAD83) | Number of General Levels | Excavation Volume (liters) |
| Stratigraphic | 1 | 1050.52NE1999.74 | [Redacted] | 3 | 290 |
| | 2 | 967.00NE1838.00 | | 2 | 400 (600[a]) |
| | 3 | 993.00NE1797.00 | | 3 | 546 (375[a]) |
| | 4 | 980.10NE1977.32 | | 4 | 387 |
| Feature | 5 | 917.00NE1861.00 | | 2 | 140[b] |
| | 6 | 876.50NE1824.25 | | 1 | 26 (47[c]) |
| | 7 | 905.00NE1844.50 | | 1 | 60[b] |
| Total | | | | 16 | 1,896 (975[a]) |

[a] Additional unscreened volume.
[b] Includes sediment originally assigned to feature level.
[c] Additional possible feature volume.

Table 2.5. Unit 4 soil horizon descriptions and texture data (percent).

| Depth (cm) | Horizon | Description |
|---|---|---|
| 0-18 | A | Weak, very fine granular structure; soft consistence (dry); clear, wavy boundary |
| 18-25 | AB | Moderate, medium granular structure; hard consistence (dry); clear, wavy boundary |
| 25-36 | Bt1 | Moderate, fine angular blocky structure; hard consistence (dry); few, faint clay films in pores; abrupt, wavy boundary |
| 36-40+ | Bt2 | Moderate, medium granular structure; hard consistence (dry); few, faint clay films in pores; clay films slightly more abundant than in Bt1 |

| | Size Class | | | |
|---|---|---|---|---|
| Horizon | Sand (2-.05 mm) | Silt (.05-.002 mm) | Clay (<.002 mm) | Textural Class |
| A | *17.00* | *71.93* | *11.07* | Silt Loam |
| AB | *10.55* | *68.60* | *20.85* | Silt Loam |
| Bt1 | *11.53* | *72.03* | *16.44* | Silt Loam |
| Bt2 | *9.55* | *55.27* | *35.18* | Silty Clay Loam |

20 and 27 cm SD, primarily within the lower AB and upper Bt1 horizons. Although a hearth feature was not identified within the unit, the distribution of burned stones suggests that one may exist in the vicinity, possibly to the south.

The pottery, which is described later in the "Material Culture" section, likely dates to between A.D. 1250 and 1550. This indicates that stripping of the A horizon across much of the site occurred after 700 B.P. Although the age of the burned rocks encountered in Unit 4 is not known, their position within the lower AB and upper Bt1 horizons indicates that sediment accumulation and soil formation occurred after it was deposited. This in turn suggests that at least two archaeological components are present in this portion of the site: a lower component represented by chipped stone artifacts and the scatter of burned stones and an upper component represented by chipped stone artifacts and pottery.

*Unit 1*

Unit 1 was located roughly 75 m north-northeast of Unit 4 and 45 m beyond of the toe of the blockfield. The surface adjacent to Unit 1 appeared to have been affected to some extent by sheetwash erosion. Vegetation around the excavation square consisted of mature sage and sparse bunch grass (figure 2.24).

Three general excavation levels were removed from Unit 1, revealing four soil horizons (table 2.7). The uppermost consisted of a weak 8-cm-thick A horizon. Beneath the A horizon was a 6-cm-thick AB and two Bt horizons, the upper of which was 9 cm thick and the lower of which was more than 7 cm

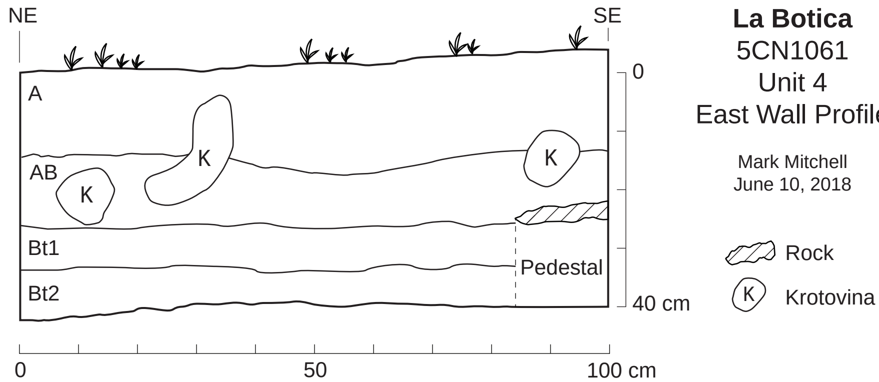



*Figure 2.22. Drawing of the east profile of Unit 4.*


*Figure 2.23. Photograph of the east profile of Unit 4.*

Table 2.6. Inventory of artifacts recovered from Unit 4 organized by general excavation level.

| General Level | Depth (cm SD) | Artifacts |
|---|---|---|
| 1 | 0-10 | 1 flake; 2 sherds |
| 2 | 10-20 | 1 flake |
| 3 | 20-30 | 2 flakes; 9 burned rocks (2.05 kg) |
| 4 | 30-40 | [none] |

thick. All of the horizons observed in Unit 1 contained higher proportions of sand-sized particles than those observed in Unit 4 and lower proportions of silt-sized particles. This may indicate that the sources of parent materials differed in different parts of the site. The relatively weak development of the A horizon in Unit 1 compared to that in Unit 4 appears to reflect surface stripping in the area around Unit 1.

Twelve flakes were recovered from the first general level (0-10 cm below the modern surface), 11 of which were made from basalt. The twelfth was made from rhyolite. Three small, angular cobbles were mapped on the surface, none of which were burned. A single obsidian flake was recovered from GL2 (10-20 cm), although it may have been dislodged from the unit wall in GL1. No flakes were recovered from GL3 (20-30 cm) and no other artifacts were encountered.

### *Units 2 and 3*

Two excavation squares were opened in the site's central hydrologic basin. Unit 2 was located on the southeast edge of the basin, while Unit 3 was located approximately 50 m to the northwest. The surface of the basin is level and supports a dense cover of bunch grass. A mature sage community, including individual plants reaching nearly 2 m in height, surrounds the basin. Big sage (*Artemisia tridentate*) prefers well-drained soil; the presence of fine-grained sediment within the basin, combined with periodic ponding of surface water, likely explains the absence of sage within the basin (Kelly Kindscher, personal communication 2018).

A southwest-northeast line of cobbles and boulders bisects the basin. The tops of the boulders and cobbles are mostly flush with the modern surface.

*Figure 2.24. Photograph of volunteers Stephanie Boktor (right), and Matt Fisher (middle), and PCRG Project Archaeologist Talle Hogrefe (left) working in Unit 1.*

Table 2.7. Unit 1 soil horizon descriptions and texture data (percent).

| Depth (cm) | Horizon | Description |
|---|---|---|
| 0-8 | A | Massive; loose consistence (dry); smooth, clear boundary |
| 8-14 | AB | Weak, fine granular structure; soft consistence (dry); wavy, clear boundary |
| 14-23 | Bt1 | Moderate, medium granular structure; hard consistence (dry); few, faint clay films in pores |
| 23-30+ | Bt2 | Medium, fine angular blocky structure; hard consistence (dry); common, distinct clay films on ped faces |

| | Size Class | | | |
|---|---|---|---|---|
| Horizon | Sand (2-.05 mm) | Silt (.05-.002 mm) | Clay (<.002 mm) | Textural Class |
| A | *29.81* | *60.53* | *9.66* | Silt Loam |
| AB | *39.60* | *42.17* | *18.23* | Loam |
| Bt1 | *36.52* | *33.48* | *30.00* | Clay Loam |
| Bt2 | *42.13* | *29.73* | *28.14* | Clay Loam |

Larger boulders occur on the southwest end of the line. On the northeast, outside the basin, the line of cobbles is more substantial, tightly interlocked, and stands 10 to 20 cm above the surface.

Standard archaeological field methods, including level control and dryscreening, were applied to three 20-cm-thick general levels in Unit 2 (0-60 cm SD) and two general levels (0-40 cm SD) in Unit 3. Recovered artifacts include an obsidian projectile point fragment and four size grade 3 flakes (table 2.8). Sparse natural cobbles occurred in the first level in both units.

Because these few artifacts appeared to be out of context, as described later in this section, and because controlled excavation below 60 cm in Unit 2 and 40 cm in Unit 3 was challenging due to the clay content of the sediment, further excavation was conducted without screening or level control. The maximum depth of Unit 2 was approximately 130 cm and the maximum depth of Unit 3 was approximately 110 cm. A bucket auger was used to obtain a sediment sample from a depth of 165 cm in Unit 2. Soil samples were taken from the west profile of Unit 2 and the south profile of Unit 3. A bulk sediment sample was taken from Unit 3 for radiocarbon dating. Two optically stimulated luminescence (OSL) samples were taken from Unit 2 and one was taken from Unit 3.

Tables 2.9 and 2.10 provide horizon descriptions and other data for Units 2 and 3, respectively. Similar horizons were observed in both units (figure 2.25). However, textural differences among them, particularly between the deepest exposed horizons, point to slightly different parent material sources.

Table 2.8. Inventory of artifacts recovered from Units 2 and 3.

| Unit | General Level | Artifact(s) |
|---|---|---|
| 2 | 1 (0-20) | Obsidian dart point fragment |
| | 2 (20-40) | Obsidian flake (G3) |
| 3 | 1 (0-20) | Quartzite flake (G3) |
| | 2 (20-40) | Two chert flakes (G3) |

The modern soil is represented by an A horizon and two AB horizons. All three likely formed in A horizon sediment washed into the central basin from the surrounding surface sheetwash erosion. Aeolian deposition also contributed sediment to the basin. A broad, shallow swale extends into the central basin from the toe of the blockfield; however, unbroken vegetative cover within the swale indicates that sediment was not transported from the valley wall into the central basin by spring water or snowmelt.

A single buried soil was exposed in Units 2 and 3. This well-developed soil primarily formed in silty clay loam containing sparse, rounded, coarse sand and fine gravel. The Ab and 2ABb horizons were only present in Unit 3. However, the shared and distinctive characteristics of the 2Btb1 horizon in both tests indicate that a single soil is represented.

Although the modern surface of the basin appears level, the surface adjacent to Unit 2 is in fact roughly 16 cm higher than the surface adjacent to Unit 3. And despite their proximity and common location within the central basin, cognate horizons occur at different depths in the two tests. Figure 2.26 illustrates those differences. Because the Ab and 2ABb horizons were removed from the southeast side of the basin (the area around Unit 2), the original depth of the buried soil there cannot be determined precisely. However, the clay content and columnar structure of the 2Btb1 horizon likely made it resistant to aeolian erosion. Thus, the buried soil was likely 50 to 55 cm higher on the southeast side of the basin than on the northwest.

The most parsimonious explanation for this difference is the presence of an obstruction or barrier between the two halves of the basin—which is just 60 to 65 m in diameter—that blocked the flow of surface water and the deposition of sediment. The line of stones that angles across the basin between the two test units may represent the top of a bedrock structure that only recently has been entirely buried in sediment. This may also explain the differential preservation of the Ab horizon in Unit 3: before the basin filled with sediment, the northwest side was lower, which permitted deeper ponding and greater vegetation growth. That growth helped limit the effects of the aeolian erosion that stripped away the Ab horizon on the southeast side of the basin.

A bulk sample of sediment from the Ab horizon in Unit 3 yielded a radiocarbon age of 7686±44 $^{14}$C yr B.P. (table 2.11). The radiocarbon age was determined on soil organic matter (SOM), which includes a mixture of young and old carbon, and therefore represents the apparent mean residence time of accumulated


*Figure 2.25. Photograph of the south profile of Unit 3. The scale is 1 m in length.*

Table 2.9. Unit 2 soil horizon descriptions and texture data (percent).

| Depth (cm) | Horizon | Description |
|---|---|---|
| 0-6 | A | Weak, fine, granular structure; slightly hard consistence (dry); clear, smooth boundary |
| 6-24 | AB1 | Moderate, medium, angular blocky structure; slightly hard consistence (dry); clear, smooth boundary |
| 24-42 | AB2 | Moderate, fine, angular blocky structure; slightly hard consistence (dry); few, faint clay films on ped faces; clear, smooth boundary |
| 42-87 | 2Btb1 | Strong, coarse, columnar prismatic structure; <10% gravel; extremely hard consistence (dry); common prominent clay films on ped faces, pores, and mineral grains; clear, smooth boundary |
| 87-130+ | 3Btb2 | Strong, medium, angular blocky structure; hard consistence (dry); many prominent clay films on ped faces, pores, and mineral grains |

| | Size Class | | | |
|---|---|---|---|---|
| Horizon | Sand (2-.05 mm) | Silt (.05-.002 mm) | Clay (<.002 mm) | Textural Class |
| A | *5.97* | *63.84* | *30.19* | Silty Clay Loam |
| AB1 | *8.33* | *73.70* | *17.97* | Silt Loam |
| AB2 | *11.56* | *72.39* | *16.05* | Silt Loam |
| 2Btb1 | *11.23* | *53.60* | *35.18* | Silty Clay Loam |
| 3Btb2[a] | *8.92* | *74.20* | *16.89* | Silt Loam |

[a] Mean of two samples.

Table 2.10. Unit 3 soil horizon descriptions and texture data (percent).

| Depth (cm) | Horizon | Description |
|---|---|---|
| 0-14 | A | Weak, fine, granular structure; slightly hard consistence (dry); clear, smooth boundary |
| 14-32 | AB1 | Moderate, fine, angular blocky structure; hard consistence (dry); clear, smooth boundary |
| 32-66 | AB2 | Moderate, fine, angular blocky structure; hard consistence (dry); clear, smooth boundary |
| 66-77 | Ab | Moderate, fine, angular blocky structure; hard consistence (dry); few, distinct clay films on mineral grains; clear, smooth boundary |
| 77-80 | 2ABb | Medium, very fine, angular blocky structure; slightly hard consistence (dry); common, distinct clay films on ped faces and mineral grains; clear, smooth boundary |
| 80-100 | 2Btb1 | Strong, coarse, columnar prismatic structure; <10% gravel; extremely hard consistence (dry); many prominent clay films on ped faces, pores, and mineral grains; clear, smooth boundary |
| 100+ | 2Btb2 | Strong, medium, angular blocky structure; <10% gravel; extremely hard consistence (dry); common distinct clay films on ped faces, pores, and mineral grains |

| | Size Class | | | |
|---|---|---|---|---|
| Horizon | Sand (2-.05 mm) | Silt (.05-.002 mm) | Clay (<.002 mm) | Textural Class |
| A | *3.32* | *67.84* | *28.85* | Silty Clay Loam |
| AB1 | *6.33* | *69.75* | *23.92* | Silt Loam |
| AB2[a] | *5.17* | *67.58* | *27.25* | Silty Clay Loam |
| Ab[a] | *7.54* | *62.02* | *30.44* | Silty Clay Loam |
| 2ABb | *16.06* | *51.90* | *32.04* | Silty Clay Loam |
| 2Btb1 | *n/d* | *n/d* | *n/d* | n/d |
| 2Btb2 | *16.63* | *45.76* | *37.61* | Silty Clay Loam |

[a] Mean of two samples.

organic matter (AMRT; Campbell *et al.* 1967). In general, and assuming there is no contamination by older carbon, the AMRT is always younger than the time that pedogenesis began (Matthews 1985). The radiocarbon age approximates of the age of burial and should be considered a minimum age of the soil (Holliday 2004).

Optically stimulated luminescence (OSL) dates were obtained on samples from the 2Btb1 horizon in both Units 2 and 3 and from the 3Btb2 horizon in

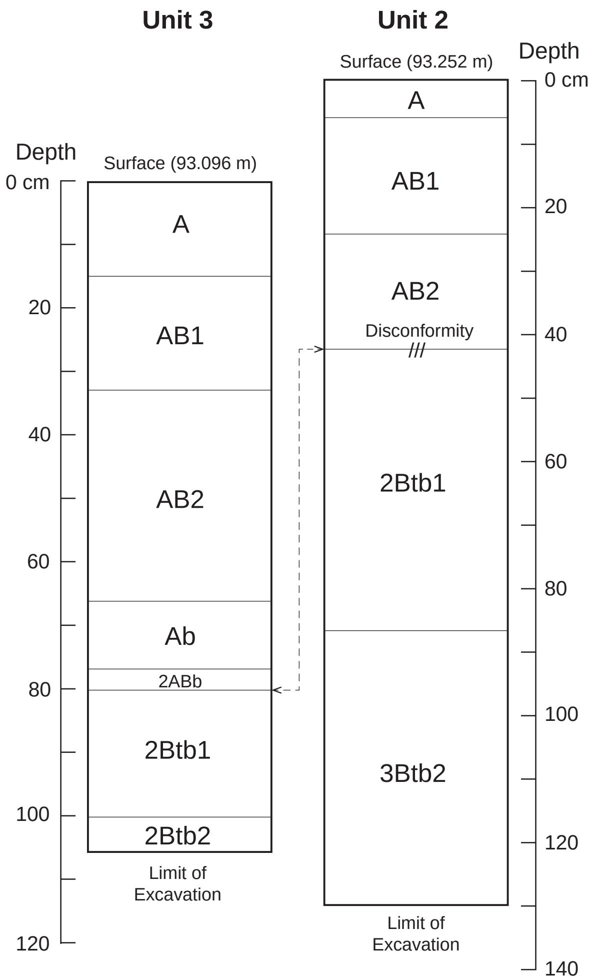



*Figure 2.26. Schematic profiles of Unit 2 (west) and Unit 3 (south). The dashed line connects cognate horizons.*

Unit 2. OSL ages range from about 9300 B.P. to about 14,700 B.P. (Kenzie Turner, personal communication 2020).

These chronometric data indicate that the lower sediment filling the central basin accumulated no later than the late Pleistocene and early Holocene. Following a period of stability, accumulation resumed sometime after about 8500 cal B.P. Subsequent accumulation consisted primarily of transported A horizon sediment. Pottery recovered from Unit 4 suggests that surface stripping reached the perimeter of the landform adjacent to the blockfield in the last 700 years.

Feature Excavations

Fort Lewis College's sample inventory of four areas within the site identified 45 cultural features described as "hearths" (Crosser *et al.* 2009). Forty-two were attributed to the site's Native American occupants, one was attributed to recent settlers, and two were not specifically attributed. All were exposed on the surface (deflated or partially deflated) and were described as concentrations of burned rock and charcoal-stained sediment. A majority were less than 50 cm in maximum dimension; several were as small as 25 cm in maximum dimension.

Twenty-seven of the 45 identified hearths were located close to the toe of the blockfield on the site's southern perimeter that Fort Lewis College researchers designated Area A. That area roughly corresponds to the western half of the 2018 Block 3 survey area, plus a portion of the site to the south and west of Block 3. Hearth features were also identified in Area B (corresponding to Block 2, plus a portion of the site west of Block 2), and Area F (corresponding to the western half of Block 1 plus areas to the north and south of Block 1). The Fort Lewis team also identified a few hearths in Areas D and E, which were not systematically examined in 2018.

To better understand the age, function, condition, and stratigraphic context of possible hearth features PCRG opened three test units within or adjacent to Block 3. Unit 6 was positioned over a concentration of charcoal and burned earth designated Feature 2. Units 5 and 7 were positioned over concentrations of charcoal-stained sediment.

*Unit 6*

Prior to excavation, the modern surface within and adjacent to Unit 6 was mostly bare earth (figure 2.27). The partially intact trunk of a dead sage was located near the center of the unit. Fragments of burned earth

Table 2.11. AMS radiocarbon dating results.

| Catalog Number | Material | Unit | Horizon | Lab Code | Percent Modern Carbon | Age ($^{14}$C yr B.P.)[a] | 2-σ Calibrated Date (cal B.P.) |
|---|---|---|---|---|---|---|---|
| 3012 | Sediment | 3 | Ab (66-77 cm SD) | D-AMS 025512 | 38.41±0.21 | 7686±44 | 8558-8399 |

[a] Corrected ages based on unreported $\delta^{13}$C values.

were visible on the surface, primarily on the east side of the unit. Two lithic flakes and one pottery sherd occurred on the surface within the unit. A single lithic flake was recovered from a subsurface context outside the primary concentration of burned earth, which was designated Feature 2.

Feature 2 proved to be shallow, unlined, and slightly amorphous basin roughly 10 cm deep and 50 cm in diameter (figure 2.28). The fill, roughly one-fifth of which (11 liters) was collected in bulk for lab analysis, contained abundant burned earth and charcoal, along with small flecks of vitrified plant tissue and a fragment of calcined micromammal bone. Although Feature 2 exhibited many of the hallmarks of a cultural feature, abundant evidence of surface burning from a wildland fire was observed in the vicinity of the feature, casting some doubt on that interpretation. The presence of a single calcined animal bone could be indicative of the feature's cultural origin or it could simply be fortuitous. On balance, the evidence suggests that Feature 2 may represent a hearth but also that that interpretation should be regarded with caution.

*Units 5 and 7*

Two other possible features investigated in 2018 (Feature 1 in Unit 5 and Feature 3 in Unit 7) proved to be root burns rather than cultural features. Both consisted of surface-visible concentrations of burned earth and charcoal-stained sediment (figure 2.29). A single chert flake was observed on the surface within Unit 5; no artifacts were observed on the surface within Unit 7. Prior to excavation, the surface within both units consisted primarily of bare earth.

Excavation revealed that both burned sediment and charcoal concentrations were amorphous in plan and profile (figure 2.30). In both cases the distribution of charcoal-stained sediment beneath the surface differed from the distribution of burned earth on the surface. The majority of the burned earth occurred on the surface, above the charcoal-stained sediment. In both cases the perimeter of the charcoal-stained sediment was amorphous and discontinuous.

*Discussion*

The feature excavation results prompted additional examination of the modern surface within and adjacent to Block 3. Apart from the two concentrations of burned rock described previously in the "Survey Results" section, numerous apparent concentrations of tabular cobbles occur on the slope below the toe of the blockfield (figure 2.31). Many appear relatively coherent; however, the characteristics of these concentrations indicate that they do not represent cultural features. The stones comprising them do not exhibit evidence of burning. The stones also are roughly equidistant from one another and primarily occur on the surface in a single plane. If these concentrations represented the partially deflated remains of basin features, one would expect at least

*Figure 2.27. Photograph of the surface of Unit 6 prior to excavation of Feature 2.*

*Figure 2.28. Photograph of Feature 2 after excavation.*

some to exhibit more stones, perhaps stacked or interlocked, in the center and fewer stones on the perimeter. Few or no artifacts are associated with the stone concentrations. In some cases, the matrix between the stones exhibits staining, but that staining is primarily due to its organic content, rather than to the presence of charcoal fines.

The surface within Block 3 is highly eroded. Remnants of A horizon sediment are held in place by the roots of shrubs, but much of the A horizon and a portion of the B horizon has been stripped away by surface erosion (figure 2.32). Tabular stones similar to those comprising the apparent concentrations line many of the channels created by surface runoff. Excavation in Unit 4 revealed a similar discontinuous pavement of stones within B horizon sediment. These observations suggest that the apparent concentrations of tabular stones were emplaced by surface erosion prior to the deposition of the sediment in which the modern soil formed. The apparent coherence of these concentrations may reflect ancient erosional features such as channels or cobble dams that locally permitted or limited the deposition of stones by sheetwash.

Also apparent within and adjacent to Block 3 is abundant evidence for recent wildland fire, including fragments of branches exhibiting burning only on their upper surfaces, numerous scattered chunks of charcoal, and surface concentrations of sintered burned earth. Features 1 and 3 clearly represented locations where sage bushes burned in place and Feature 2 may also represent the same phenomenon.

Thus, the results of the feature excavations, combined with observations on the modern surface, suggest that fewer hearth features are present at the site than previously believed. Some and perhaps many of the rock concentrations previously identified as hearths are instead fortuitous concentrations of naturally occurring cobbles exposed by erosion. Visible evidence of localized burning, including charcoal staining and burned earth, reflects natural processes rather than activities of the site's occupants. Although concentrations of burned rock representing deflated hearths do occur at the site, including Feature 5 in Block 1 and the two concentrations of


*Figure 2.29. Photograph of the surface of Unit 5 and Feature 1 prior to excavation.*

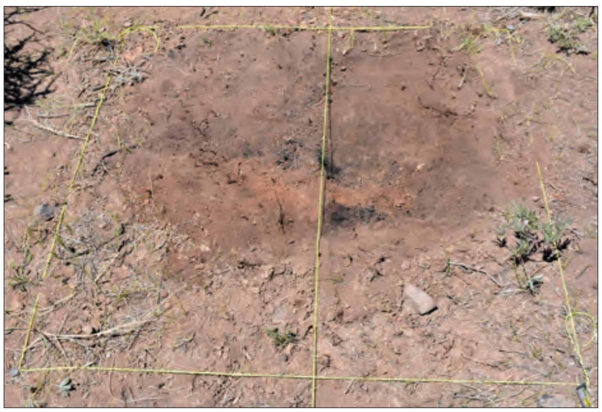


*Figure 2.30. Two photographs of Feature 1 (Unit 5).* ***Top****: bisected profile, view to the south;* ***bottom****: after excavation. Both photographs illustrate the irregular distribution of charcoal-stained sediment.*

burned rock northwest of Block 3, the total number of such features is likely to be lower than previously estimated. Small basin hearths such as Feature 2 may also occur at the site; however, there is as yet no definitive evidence for the presence of that type of feature.

**Material Culture**

Five artifact datasets were obtained during 2018. Four were collected on surface artifacts; data on the distributions of those materials were discussed previously in the "Survey Results" section. A fifth dataset was collected on items recovered from test excavation units.

The first artifact dataset contains nominal data on non-diagnostic chipped and ground stone tools located on the surface within the three inventory blocks. A total of 84 such tools were documented. Grid-level provenience (20 x 20-m square) was recorded for these items and none of them were collected.

The second artifact dataset consists of the attributes of all temporally diagnostic chipped stone tools (projectile points) observed on the surface during the project, some of which were located outside the three inventory blocks. A total of ten specimens were documented. Precise provenience (UTM coordinates) was recorded for these items; none were collected.

The third dataset consists of flaking debris density measurements collected at 233 10-m grid points

*Figure 2.31. Photograph of a natural concentration of tabular cobbles on the slope below the toe of the blockfield.*

*Figure 2.32. Photograph of active surface erosion in Block 3. The A horizon and a portion of the B horizon has been stripped away.*

within the three inventory blocks. No surface flakes were collected, apart from those located within excavation squares.

The fourth dataset consists of the attributes of all pottery sherds observed on the surface during the project, some of which were located outside the survey blocks. Precise provenience (UTM coordinates) was recorded for these items and 29 of the 44 observed sherds were collected. Data were also obtained on the lead ball recovered from CMT5, which was collected.

The fifth artifact dataset consists of data on items recovered from the surface and subsurface within the seven test excavation units, all of which were collected. The excavated collection includes three pottery sherds (one of which was recovered from the surface within an excavation unit), one chipped stone tool, and 31 lithic flakes.

Non-Diagnostic Chipped and Ground Stone Tools

Table 2.12 provides data on 84 non-diagnostic tools observed during the focused inventory. Ground stone tools make up 70 percent of the assemblage (n=59). Thirty-nine of the ground stone tools are handstones, 16 are millingstones, and 4 are indeterminate fragments. Over 80 percent (n=48) were made from igneous rock types, while the balance were made from sedimentary rocks. Twenty-five of the ground stone tools (42 percent) exhibit evidence of burning. The proportion of burned handstones (49 percent) is larger than the proportion of burned millingstones (19 percent), a pattern reflecting the recycling of handstone fragments into boiling stones.

Just under 40 percent of the handstones (n=15) exhibit multiple grinding facets. Seventeen exhibit a single facet. For seven specimens the number of facets could not be determined. Seven handstones are complete and intact, while 32 are fragments.

All of the millingstones exhibit a single grinding surface. Millingstone grinding surfaces mostly are flat or shallowly concave. Two are intact and complete, while 14 are represented by fragments.

The inventory of 25 non-diagnostic chipped stone tools includes 10 biface fragments, six unpatterned flake tools, five scrapers, three cores, and one fragment of a projectile point blade. Most of the bifaces are represented by edge fragments exhibiting general use wear. One may be a projectile point tip and another may be a drill base; however, both are too fragmented to determine their original morphology or function. Two likely are fragments of early-stage bifaces.

One of the five scrapers exhibits intensive edge grinding. The remaining specimens exhibit unspecified use-wear. One of the five is an expedient tool. Five of the six modified flake tools exhibit use-modification, while one exhibits sequential pressure flake removals on the working edge. All three of the cores are exhausted.

Both cryptocrystalline and coarse igneous raw materials are represented: nine of the chipped stone tools were made from chert or chalcedony, two were made from obsidian, and 14 were made from rhyolite

Table 2.12. Inventory of non-diagnostic chipped and ground stone tools, organized by survey block.

| Block | Artifact Type | Description | Size Grade[a] | Material | Burned |
|---|---|---|---|---|---|
| 1 | Ground stone | Bifacial handstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial millingstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial handstone fragment | 0 | Igneous | Y |
| | Ground stone | Unifacial millingstone fragment | 0 | Igneous | Y |
| | Ground stone | Unifacial handstone | 0 | Igneous | N |
| | Core | Exhausted flake core | 0 | Brown rhyolite | N |
| | Ground stone | Unifacial handstone fragment | 0 | Igneous | N |
| | Scraper | Scraper | 0 | Gray rhyolite | N |
| | Ground stone | Handstone fragment | 0 | Igneous | N |
| | Ground stone | Handstone fragment | 0 | Igneous | N |
| | Ground stone | Handstone fragment | 0 | Igneous | Y |
| | Biface | Distal (tip) fragment | 1 | White chalcedony | Y |
| | Biface | Proximal (base) fragment | 1 | Mottled red chert | N |
| | Ground stone | Bifacial handstone fragment | 0 | Igneous | N |
| | Biface | Early stage | 0 | Dark gray andesite or basalt | N |
| | Biface | Early stage mid-section | 0 | Mottled purple chert | Y |
| | Scraper | Edge fragment | 1 | Banded gray chert | N |
| | Ground stone | Unifacial handstone | 0 | Igneous | Y |
| | Ground stone | Bifacial handstone fragment | 0 | Igneous | Y |
| | Biface | Fragment (spall) | 1 | Obsidian | N |
| | Ground stone | Unifacial millingstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial handstone | 0 | Igneous | Y |
| | Ground stone | Bifacial handstone fragment | 0 | Igneous | Y |
| | Ground stone | Bifacial handstone (complete) | 0 | Igneous | Y |
| | Ground stone | Bifacial handstone fragment | 0 | Igneous | Y |
| | Ground stone | Bifacial handstone fragment | 0 | Igneous | Y |
| | Ground stone | Unifacial handstone (complete) | 0 | Igneous | Y |
| | Ground stone | Unifacial fragment (spall) | 0 | Igneous | Y |
| | Biface | Fragment | 1 | Chalcedony | N |
| | Ground stone | Fragment | 0 | Igneous | N |
| | Ground stone | Fragment(?) | 0 | Igneous | Y |
| | Ground stone | Millingstone fragment | 0 | Igneous | Y |
| | Biface | Fragment | 1 | Pulvadera obsidian | N |
| | Ground stone | Fragment | 0 | Igneous | Y |
| | Ground stone | Millingstone fragment | 0 | Igneous | Y |
| | Ground stone | Handstone fragment (spall) | 0 | Igneous | Y |
| | Biface | Small edge fragment | 0 | Andesite or basalt | N |
| | Ground stone | Unifacial millingstone | 0 | Igneous | N |
| | Ground stone | Unifacial slab millingstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial handstone (complete) | 0 | Igneous | N |
| | Ground stone | Unifacial millingstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial handstone fragment | 0 | Igneous | Y |
| | Ground stone | Bifacial handstone fragment | 0 | Igneous | Y |
| | Ground stone | Unifacial handstone fragment (spall) | 0 | Igneous | Y |
| | Flake tool | Retouched flake | 1 | Gray Cumbres chert | N |
| | Scraper | Flat scraper | 0 | Basalt | N |
| | Scraper | Scraper | 0 | Basalt | N |
| | Ground stone | Tri-faceted handstone | 0 | Igneous | Y |
| | Ground stone | Millingstone fragment | 0 | Igneous | N |

Table 2.12. Non-diagnostic stone tools *continued.*

| Block | Artifact Type | Description | Size Grade[a] | Material | Burned |
|---|---|---|---|---|---|
| 1 | Core | Exhausted core | 0 | Rhyolite | N |
| | Ground stone | Millingstone fragment | 0 | Igneous | N |
| | Scraper | Expedient scraper | 0 | Basalt | N |
| | Ground stone | Bifacial handstone fragment | 0 | Igneous | N |
| | Ground stone | Bifacial handstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial millingstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial handstone fragment | 0 | Igneous | N |
| | Ground stone | Handstone fragment | 0 | Igneous | Y |
| | Ground stone | Millingstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial handstone fragment | 0 | Igneous | N |
| | Ground stone | Unifacial handstone fragment | 0 | Igneous | N |
| | Ground stone | Bifacial handstone (complete) | 0 | Igneous | N |
| | Ground stone | Handstone fragment | 0 | Igneous | Y |
| | Ground stone | Unifacial handstone (complete) | 0 | Igneous | N |
| 2 | Ground stone | Handstone fragment | 0 | Igneous | Y |
| | Core | Fragment | 0 | Gray rhyolite | N |
| | Projectile point | Tip fragment | 2 | White chert | N |
| | Ground stone | Millingstone (complete) | 0 | Sedimentary | N |
| | Ground stone | Unifacial handstone fragment | 0 | Sedimentary | Y |
| | Flake tool | Edge-modified flake fragment | 0 | Rhyolite | N |
| | Ground stone | Millingstone fragment | 0 | Sedimentary | N |
| | Biface | Early stage fragment | 0 | Basalt | N |
| | Flake tool | Fragment | 1 | Rhyolite | N |
| | Flake tool | Fragment | 0 | Rhyolite | N |
| | Ground stone | Bifacial handstone fragment | 0 | Sedimentary | N |
| | Ground stone | Millingstone (complete) | 0 | Sedimentary | N |
| | Ground stone | Unifacial handstone (complete) | 0 | Sedimentary | N |
| | Ground stone | Handstone fragment | 0 | Sedimentary | N |
| | Biface | Fragment | 2 | Cumbres chert | Y |
| | Ground stone | Bifacial handstone fragment | 0 | Sedimentary | N |
| | Ground stone | Millingstone fragment | 0 | Sedimentary | N |
| 3 | Ground stone | Unifacial handstone (complete) | 0 | Sedimentary | N |
| | Flake tool | Flake tool | 0 | Rhyolite | N |
| | Flake tool | Small edge-modified flake | 1 | Cumbres chert | Y |
| | Ground stone | Bifacial handstone fragment | 0 | Sedimentary | N |

[a] Size grade classes: 0 (> 1 in); 1 (½-1 in); 2 (¼-½ in); 3 (<¼ in).

or basalt. Four tools, including three of the bifaces and one of the flake tools, exhibit evidence of burning.

## Projectile Points

Projectile point types are assigned where possible. The types primarily are those defined for the Oshara Tradition (Irwin-Williams 1973), as re-defined by Chapin (2005). Only one of the eleven specimens were collected, a fragmented point from GL1 of Unit 2, which was analyzed and photographed in the lab. Photos were taken and metric and other data were recorded in the field for the other 10 specimens (figures 2.33 and 2.34; tables 2.13 and 2.14).

**Projectile Point 1** (**PP1**) is an obsidian dart point with a square to slightly expanding stem and slightly convex base (figure 2.33[B]). The cross section is thick, lenticular, and slightly asymmetrical. Lateral grinding occurs on the stem. The base exhibits a trample fracture. A bending break occurs on the distal end of the specimen, with small subsequent flake removals from the break surface on one face. Retouching indicative of re-use along with subsequent trample fractures occur on both blade margins. Based on the available metric data and the general morphology, the point style is similar to what Chapin (2005:136) identifies as Armijo Stemmed, which dates to between 2500 and 3500 B.P.

**PP2** is a small side-notched arrow point with a concave base made from a purple to tan chalcedony with white inclusions (figure 2.33[A]). This raw material may come from the Cumbres chert source locality, which is approximately 30 km southwest of La Botica. The point is well made and exhibits long, narrow notches. A small burination fracture occurs on the distal end. A lunate trample fracture occurs on one blade margin. The haft element is not ground. Points of this style generally post-date A.D. 1150.

**PP3** is a dart point with a straight (square) stem and slightly convex base made on a basalt or dacite flake (figure 2.34[C]). An impact fracture occurs just above the haft element. The shoulders are very abrupt and the haft is unground. The metric data and morphology are similar to what Chapin (2005:136) identifies as Armijo Stemmed, which dates to between 2500 and 3500 B.P.

**PP4** is a proximal fragment of a lanceolate dart point (figure 2.33[D]). The specimen is made from a buff-colored rhyolite, possibly from a source locality in English Valley, which is located 65 km north of La Botica. An impact burination fracture occurs on one margin. The point's cross section is lenticular to slightly plano-convex. Two large basal flake scars occur on one face, while several smaller flake scars occur on the obverse. The stem is contracting, and the base is straight. A bending fracture occurs at or slightly proximal to the distal extent of lateral grinding, which is moderate to heavy. The base is not

Table 2.13. Projectile point metric data.

| | Measurement (mm)[a] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ID | TL | MW | TH | PHW | DHW | DHL | BBW | BL | ND | NW |
| PP1 | - | 20.0 | 6.0 | 13.0 | 14.0 | 5.0 | 20.0 | - | 3.0 | 5.0 |
| PP2 | 22.0 | 12.0 | 3.0 | 14.0 | 7.0 | 5.0 | 12.0 | 14.0 | 3.0 | 3.0 |
| PP3 | - | - | 5.5 | 15.0 | 15.7 | 9.6 | - | - | - | - |
| PP4 | - | - | 9.1 | 17.7 | - | 25.0 | - | - | - | - |
| PP5 | 10.0 | 13.0 | 5.0 | 13.0 | - | 10.0 | - | - | - | - |
| PP6 | 23.0 | 21.0 | 6.0 | 12.0 | 12.0 | 7.0 | 21.0 | 25.0 | - | - |
| PP7 | 14.0 | 15.00 | 4.0 | - | - | - | - | - | - | - |
| PP8 | 15.0 | 13.00 | 3.0 | - | - | - | - | - | 4.0 | 3.0 |
| PP9 | - | - | 4.9 | 19.6 | 16.2 | 7.5 | 18.3 | - | 1.6 | 4.8 |
| PP10 | 18.1 | 14.0 | 3.2 | 14.0 | - | - | 14.0 | 18.0 | - | - |
| PP11 | - | - | 7.25 | - | 11.6 | 3.4 | - | - | 3.2 | 6.1 |

[a]TL=total length; MW=maximum width; TH=thickness; PHW=proximal haft width; DHW=distal haft width; DHL=distal haft length; BBW=blade base width; Bl=blade length; ND=notch depth; NW=notch width

Table 2.14. Projectile point nominal data.

| ID | Raw Material | Completeness | Estimated Age | Figure Reference |
|---|---|---|---|---|
| PP1 | Obsidian | Proximal and midsection | Late Archaic | 2.33 (B) |
| PP2 | Chalcedony | Complete (broken tip) | Late Prehistoric | 2.33 (A) |
| PP3 | Basalt | Proximal | Late Archaic | 2.34 (C) |
| PP4 | Rhyolite | Proximal and midsection | Early Archaic | 2.33 (D) |
| PP5 | Obsidian | Proximal | Middle Archaic | 2.33 (C) |
| PP6 | Quartzite | Complete (broken tip) | Late Archaic | 2.33 (E) |
| PP7 | Quartzite | Proximal | Archaic | 2.34 (B) |
| PP8 | Chert | Proximal portion | Middle/Late Archaic | 2.34 (A) |
| PP9 | Basalt | Proximal | Middle Archaic | 2.33 (F) |
| PP10 | Quartzite | Midsection | Late Prehistoric | 2.34 (D) |
| PP11 | Obsidian | Proximal and midsection | Archaic | 2.34 (E) |

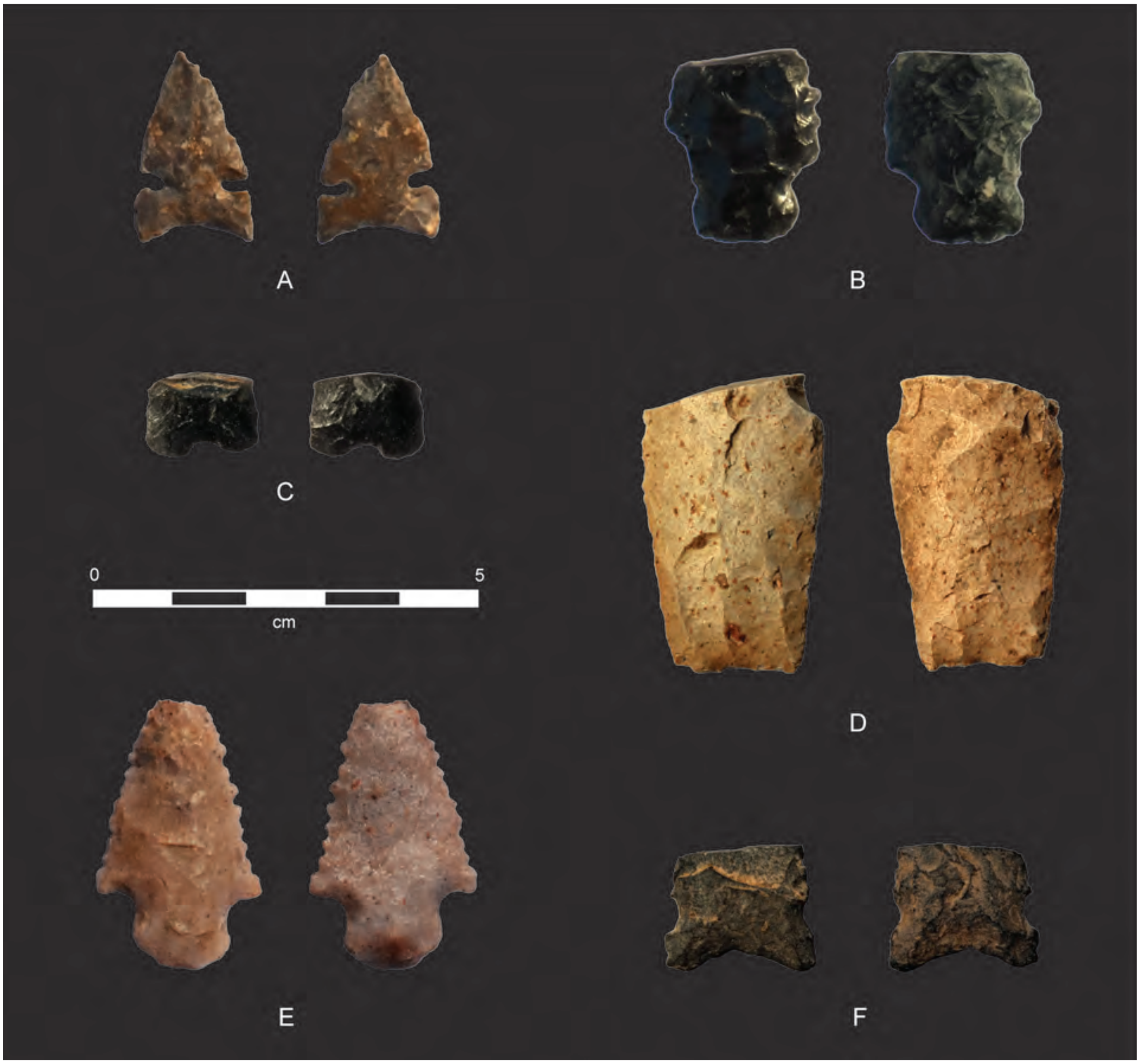



*Figure 2.33. Projectile points recorded during the 2018 fieldwork. Figure references are noted in table 2.14 and within the text.*

ground. The point is most similar to Jay points, which Chapin (2005:121) notes are similar to Hell Gap and Agate Basin Paleoindian points on the Great Plains. The dating of Jay points is still poorly understood, but Chapin indicates an Early Archaic range (8000-5000 B.P., and specifically 7500-6800 B.P. for the Jay Phase) is most likely correct.

**PP5** is a stemmed-indented base dart point made from Polvadera Peak (El Rechuelos) obsidian (figure 2.33[C]). The blade has been broken away and a bending fracture occurs on the distal end of the haft. Grinding and smoothing occurs on the lateral and basal margins, including within the basal indentation. The point shares some attributes of the Bajada points Chapin (2005:123-127) discusses; however, the base and hafting width on PP5 are much smaller than the range suggested for Bajada points. It is also similar to McKean dart points, a type name better suited for the Central and Northern Plains. The point likely dates to the Middle Archaic period.

**PP6** is a mostly complete corner-notched to stemmed dart point made from Trickle Mountain (Alkali Creek) quartzite (figure 2.33[E]). The Trickle Mountain source locality is approximately 105 km north of La Botica. The specimen's base is slightly expanding, and the blade is serrated. The haft is not ground. An impact fracture occurs on the tip. The size and morphology are similar to what Chapin (2005:136) identifies as Armijo Stemmed, which dates to between 2500 and 3500 B.P.

**PP7** is a proximal fragment of a stemmed dart point made from fine-grained mottled orthoquartzite (figure 2.34[B]). It has a lenticular cross section and trample fractures occur on one margin. Light grinding occurs on the proximal lateral margins, which are mostly straight. The base is straight to slightly convex. The point has some similarities to multiple Archaic stemmed points but is not indicative of a specific type.

**PP8** is a triangular side-notched dart point fragment made from yellow chert (figure 2.34[A]). The point was made on a flake and exhibits a roughly rectangular cross section. The haft element is not ground. It is heavily fragmented, missing the base, one haft margin, and most of the midsection and tip. A hafting width could not be measured but it is at least 11 mm, which indicates it is most likely a side-notched dart point. It most likely dates to the Middle to Late Archaic but is too fragmented to be assigned a more specific type or age.

**PP9** is a triangular dart point with low, shallow side notches and a deeply concave base (figure 2.33[F]). The point is made from basalt or dacite. The proximal lateral margins and base are ground and arises on both faces exhibit wear. The point is similar to the Armijo Concave Base type Chapin (2005:133-135) discusses; however, the base and hafting width are both a few millimeters wider on PP9 than the ranges he identified. The size more closely aligns with the Grants San Jose type identified by Chapin (2005:131-132). The one major difference between PP9 and that type is the appearance of notches on PP9, whereas Grants San Jose have much sharper concave stem edges. Both types date to the Middle Archaic period.

**PP10** is the midsection of an arrow point made from Trickle Mountain (Alkali Creek) quartzite (figure 2.34[D]). The Trickle Mountain source locality is approximately 105 km north of La Botica. A snap (non-impact) fracture occurs on the distal end of the blade. The point's cross section is lenticular, and the lower margin of one haft element is ground. The base is missing, but evidence of notching is visible on the proximal end of one margin. The point is most likely a side-notched arrow point, similar to PP2, and post-dates A.D. 1150.

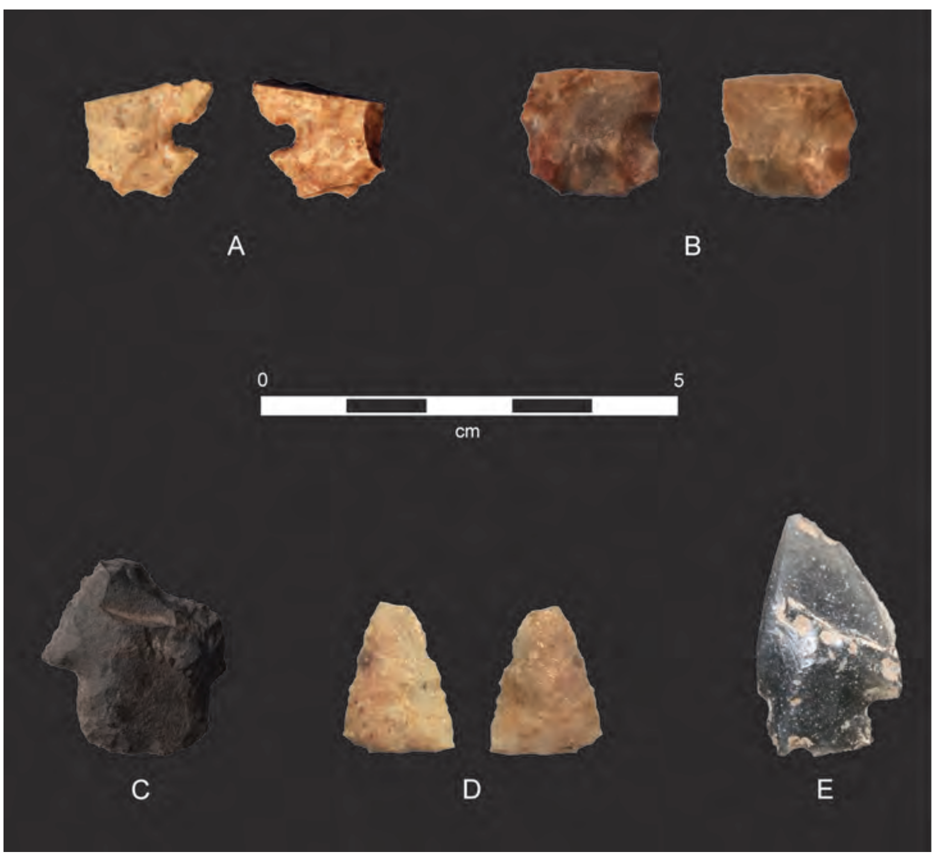



*Figure 2.34. Projectile points recorded during the 2018 fieldwork. Figure references are noted in table 2.14 and within the text.*

**PP11** is a fragmented dart point made from from Polvadera Peak (El Rechuelos) obsidian (figure 2.34[E]). The point, the only collected projectile point specimen (CN3002) was found in GL1 of Unit 2, and as explained earlier in this chapter, is likely out of context. One notch is clearly visible, while traces of the opposing notch are visible. Both blade margins are missing and the face of one side is also missing via a fracture that initiated from the distal end. The opposing face is also mostly missing, likely from the same fracture. The base is fragmented making any type designation impossible, but the hafting width indicates it is most likely an Archaic dart point.

Flaking Debris

A total of 31 flakes were recovered from the seven excavation units (table 2.15). A variety of materials are represented: 14 were made from basalt (dacite) or rhyolite, 11 were made from chert or chalcedony, five were made from obsidian, and one was made from orthoquartzite. Materials representing several known sources are present, including Cumbres Pass chert, Polvadera Peak (El Rechuelos) obsidian, and possibly Trickle Mountain (Alkali Creek) quartzite. The distances between these sources and La Botica range from about 25 km (Cumbres Pass chert), to 100 km (Trickle Mountain quartzite), to 150 km (Polvadera Peak obsidian) (Spero and Hoefer 1999). Numerous sources of rhyolite and basalt (dacite) occur within the San Luis Valley and Taos Plateau Volcanic Field (Boyer *et al*. 2001; Shackley 2011).

Just over 60 percent are assigned to size grade 3, which includes specimens larger than ¼ in but smaller than ½ in. Just three of the size grade 2 (½ to 1 in) and size grade 3 flakes exhibit evidence of burning. Two flakes exhibit cortex and none show evidence of intentional heat treatment.

Three complete flakes occur in the assemblage, including one basalt, one chalcedony, and one quartzite flake. All are percussion flakes; the complete quartzite flake exhibits a faceted platform. These flake type data point to mid- to late-stage biface production.

Table 2.16 summarizes flaking debris density data within the three survey blocks; spatial data on flaking density were presented previously in the "Survey Results" section. No flakes were observed within six of the 233 10 x 10-m grid squares. Calculated flake densities within the remaining 227 cells ranged from 0.02 to 14.29 flakes/m$^2$. Among the 233 surveyed grid squares the mean density was 0.83 flakes/m$^2$ and the median density was 0.29 flakes/m$^2$. Based on the mean density, the total number of flakes within the survey blocks is estimated at approximately 19,300.

Pottery

A total of 32 pottery sherds were collected during 2018, including 30 from the surface (one of which came from the surface within Unit 6) and two from the subsurface (table 2.17). These 32 specimens represent at least seven different vessels (table 2.18).

**Vessel 1** is a small jar represented by six sherds, including one lip sherd, two neck sherds, and three body sherds, that together weigh 10.7 g (figure 2.35). Mean body sherd thickness is 5.1 mm. The lip is slightly everted and thinned. Paste is dark gray to black and compact. The temper consists of crushed quartz and granitic gneiss. The surface is plain and wiped; temper particles slightly protrude. No decorative motifs are preserved.

Vessel 1 exhibits the characteristics of Taos Gray, a type designation that includes Taos Gray Plain and undecorated fragments of Taos Gray Incised, Taos Gray Corrugated, and Taos Gray Neckbanded (Levine 1994; OSA 2020a; Wetherington 1968; Wilson 2007). Production of Taos Gray began about A.D. 1100 and may have continued into the eighteenth century (Levine 1994).

**Vessel 2** is a jar represented by a single lower body sherd weighing 7.1 g (figure 2.35). The exterior surface exhibits fine, partially obliterated cord-roughening. The paste is red to brown and poorly compacted. Temper consists of poorly sorted crushed granite and quartz sand. Anvil marks are evident on the interior.

Pottery exhibiting the characteristics of Vessel 2 were produced across the Central and Southern Plains during the Late Prehistoric. In the Arkansas River basin in southeastern Colorado, cord-roughened pottery first appeared during the Developmental period (A.D. 100 – 1050). Fine obliterated cord-roughening may have been more common during the succeeding Diversification period (A.D. 1050 – 1450). However, the attribute that best discriminates between Developmental period and Diversification period pottery is vessel shape, which cannot confidently be determined from the single specimen from La Botica. Nevertheless, Vessel 2 is cautiously attributed to the Diversification period.

**Vessel 3** is a small jar represented by three body sherds, including one that preserves the vessel's shoulder (figure 2.35). The three sherds weigh 5.0 g.

Table 2.15. Excavated flaking debris data.

| Unit No. | Level | Size Grade | Material | Burned | Heat Treated | Cortex | Completeness | Count | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 3 | Basalt | No | - | N | Flake Fragment | 5 | 1.50 |
| | 1 | 3 | Basalt | No | - | N | Broken Flake | 1 | 1.10 |
| | 1 | 3 | Rhyolite/Tuff | No | - | N | Flake Fragment | 1 | 0.30 |
| | 1 | 4 | Basalt | - | - | N | - | 5 | 0.70 |
| | 2 | 4 | Obsidian | - | - | N | - | 1 | 0.03 |
| 2 | 2 | 3 | Obsidian | No | - | N | Flake Fragment | 1 | 0.10 |
| 3 | 1 | 3 | Quartzite | No | - | Y | Complete Flake | 1 | 1.10 |
| | 2 | 3 | Chert | Yes | N | N | Flake Fragment | 2 | 1.70 |
| 4 | 1 | 3 | Basalt | No | - | N | Complete Flake | 1 | 0.30 |
| | 1 | 3 | Chert | No | N | N | Flake Fragment | 1 | 0.20 |
| | 2 | 4 | Obsidian | - | - | N | - | 1 | 0.03 |
| | 3 | 3 | Obsidian | No | - | N | Broken Flake | 1 | 0.20 |
| | 3 | 3 | Rhyolite/Tuff | No | - | N | Broken Flake | 1 | 1.30 |
| | 4 | 2 | Obsidian | No | - | N | Flake Fragment | 1 | 1.00 |
| 5 | 1 | 3 | Chalcedony | No | N | N | Complete Flake | 1 | 0.03 |
| | 1 | 3 | Chert | Yes | Unknown | N | Flake Fragment | 1 | 0.20 |
| | 1 | 4 | Chert | - | - | N | - | 1 | 0.03 |
| | 2 | 3 | Chert | No | N | N | Broken Flake | 1 | 0.40 |
| 6 | 1 | 2 | Chert | No | N | N | Flake Fragment | 1 | 1.90 |
| | 1 | 3 | Chert | No | N | Y | Flake Fragment | 1 | 1.50 |
| | 1 | 4 | Chert | - | - | N | - | 1 | 0.03 |
| 7 | 1 | 4 | Chert | - | - | N | - | 1 | 0.03 |
| Total | | | | | | | | 31 | 13.68 |

Table 2.16. Distribution of calculated flake density values among 233 grid cells.

| Density Class (flakes/m$^2$) | Number of 10 x 10-m Cells | Estimated Total Flake Count for Density Class |
|---|---|---|
| 0.0 | 6 | 0 |
| < 0.5 | 140 | 2,563 |
| 0.5-1.0 | 44 | 3,198 |
| 1.0-2.0 | 20 | 2,746 |
| >2.0 | 23 | 10,789 |
| Total | 233 | 19,296 |

Mean vessel wall thickness is 4.7 mm. The paste is gray and compact. Temper consists of crushed rock, primarily quartz. The exterior surface is plain and wiped and lacks decoration or polish.

Although the paste of Vessel 3 differs somewhat from that of Vessel 1, it too likely represents a Taos Gray vessel produced by Northern Tiwa potters beginning around A.D. 1100.

**Vessel 4** is jar represented by six sherds weighing 26.7 g (figure 2.35). Among the six are two vessel base sherds, one of which is basket-impressed, and four body sherds. Three of the four body sherds come from below the vessel's shoulder. Mean body sherd thickness is 5.8 mm. The mean thickness of the two base sherds is 6.6 mm. The vessel's base was flattened.

The paste is brown and contains abundant, poorly sorted crushed quartz and granitic gneiss temper. Some temper particles are as large as 3 or 4 mm. The surface is plain and temper particles slightly protrude. The single upper body sherd exhibits two broad, shallow incised lines.

Vessel 4 exhibits the attributes of Taos Gray Incised pottery, which Northern Tiwa potters produced between about A.D. 1100 and 1350 (Levine 1994). However, Taos Gray Incised was more common during the Valdez phase, from A.D. 1100 to 1225.

Table 2.17. Data on collected pottery sherds.

| Vessel Number | Catalog Number | Provenience | Size Grade[a] | Weight (g) | Thickness (mm) | Vessel Part | Subpart |
|---|---|---|---|---|---|---|---|
| 1 | 1001 | Surface | G2 | 1.79 | 5.17-4.94 | Rim | Neck |
| | 1002 | Surface | G2 | 2.07 | 5.00-4.50 | Body | Upper (?) |
| | 1003 | Surface | G3 | 1.34 | 5.25-4.81 | Body | Upper (?) |
| | 1004 | Surface | G2 | 2.66 | 5.62-5.10 | Body | Upper |
| | 1005 | Surface | G2 | 1.79 | 5.32-4.38 | Rim | Neck |
| | 4006 | Surface[b] | G3 | 1.02 | 4.73-3.89 | Rim | Lip |
| 2 | 1006 | Surface | G2 | 7.13 | 6.97-5.04 | Body | Lower (?) |
| 3 | 1007 | Surface | G3 | 1.55 | 4.58-4.31 | Body | Upper (?) |
| | 1008 | Surface | G3 | 1.73 | 4.93-4.21 | Body | Shoulder |
| | 1008 | Surface | G3 | 1.75 | 5.15-4.76 | Body | Lower |
| 4 | 1009 | Surface | G3 | 2.09 | 5.65-5.26 | Body | Upper |
| | 1009 | Surface | G2 | 4.72 | 6.93-4.79 | Body | Lower |
| | 1009 | Surface | G2 | 7.59 | 7.39-6.51 | Base | - |
| | 1009 | Surface | G2 | 5.21 | 7.00-5.63 | Base[c] | - |
| | 1009 | Surface | G2 | 3.93 | 6.77-5.53 | Body | Lower |
| | 1009 | Surface | G2 | 3.14 | 6.63-4.80 | Body | Lower |
| 5 | 1010 | Surface | G3 | 1.62 | 6.55-5.90 | Body | Upper |
| | 1010 | Surface | G3 | 1.79 | 6.34-5.61 | Rim | Neck |
| | 1010 | Surface | G2 | 5.80 | 6.00-4.84 | Body | Shoulder |
| | 1010 | Surface | G2 | 4.93 | 6.57-4.85 | Body[d] | Lower (?) |
| | 1010 | Surface | G2 | 4.32 | 6.78-5.78 | Body | Lower (?) |
| | 1010 | Surface | G2 | 2.45 | 6.50-5.70 | Body | Upper (?) |
| | 1010 | Surface | G2 | 4.22 | 5.94-5.60 | Body | Upper |
| | 1010 | Surface | G2 | 3.85 | 6.15-5.09 | Body | Upper |
| | 1010 | Surface | G2 | 3.25 | 6.60-5.67 | Body | Upper |
| | 1010 | Surface | G2 | 3.37 | 6.12-6.08 | Body | Upper |
| | 1010 | Surface | G2 | 2.94 | 6.38-5.71 | Body | Upper |
| 5? | 1011 | Surface | G2 | 3.83 | 6.73-5.74 | Body | Upper |
| 6 | 1012 | Surface | G2 | 2.45 | 4.91-3.98 | Body | Shoulder |
| | 1013 | Surface | G2 | 2.19 | 5.40-4.11 | Body | Shoulder |
| 7 | 2003 | Excavated | G2 | 5.64 | 6.00-4.87 | Body | Lower (?) |
| 7? | 2003 | Excavated | G2 | 2.51 | 5.44-4.91 | Body | Unknown |

[a] G2 (¼-½ in); G3 (⅛-¼ in).
[b] Within Excavation Unit 6.
[c] Basket-impressed.
[d] Modified sherd.

**Vessel 5** is a jar represented by at least 11 collected sherds (figure 2.36). A twelfth sherd in the collection is tentatively assigned to Vessel 5. The 11 or 12 sherds representing Vessel 5 occurred in a cluster that included an additional approximately 14 sherds from the same vessel that were not collected. The cluster was approximately 1.75 m north-south by 2.5 m east-west, or about 3.5 m$^2$.

The mean thickness of the 12 sherds in the sample is 6.0 mm. Paste is compact and gray brown. Temper consists of well-sorted crushed granitic gneiss and quartz with sparse larger grains of feldspar. The surface is plain and smoothed. Incised lines and punctate tool marks occur on several sherds.

One lower body sherd exhibits smoothing and grinding on the exterior surface. The surface modification likely occurred after the vessel was broken; this sherd may have been recycled as a small palette or grinding slab.

Like Vessel 4, Vessel 5 exhibits the attributes to Taos Gray Incised pottery produced in the Taos district between A.D. 1100 and 1350. Taos Gray


*Figure 2.35. Selected sherds from five pottery vessels collected in 2018.*

Incised was the dominant utility ware produced between A.D. 1100 and 1225.

**Vessel 6** is represented by two body sherds weighing 4.6 g (figure 2.35). Both represent portions of the vessel's shoulder. Eroded vertical incisions or tool marks may be visible on the exterior. Mean vessel wall thickness is 4.6 mm. Paste is black and contains abundant crushed quartz and mica temper. The vessel's walls are poorly compacted and numerous voids are present. Vessel wall thickness is uneven. J-shaped coil breaks are clearly evident on one sherd and moderately evident on the other.

Vessel 6 may be assignable to a poorly defined group of Northern Rio Grande micaceous tempered wares (Warren 1981; Wilson 2007). Utility wares tempered with crushed rock containing mica appeared "early in the ceramic history of the Rio Grande," and Wilson (2007:18) assigns this group to the period between A.D. 1350 and 1450. Warren (1981) suggests a later and longer period between A.D. 1450 and 1700. However, it is not clear that the La Botica specimens exhibit the surface treatment attributes of these wares.

**Vessel 7** is represented by at least one body sherd recovered from a subsurface context in Unit 4 (figure

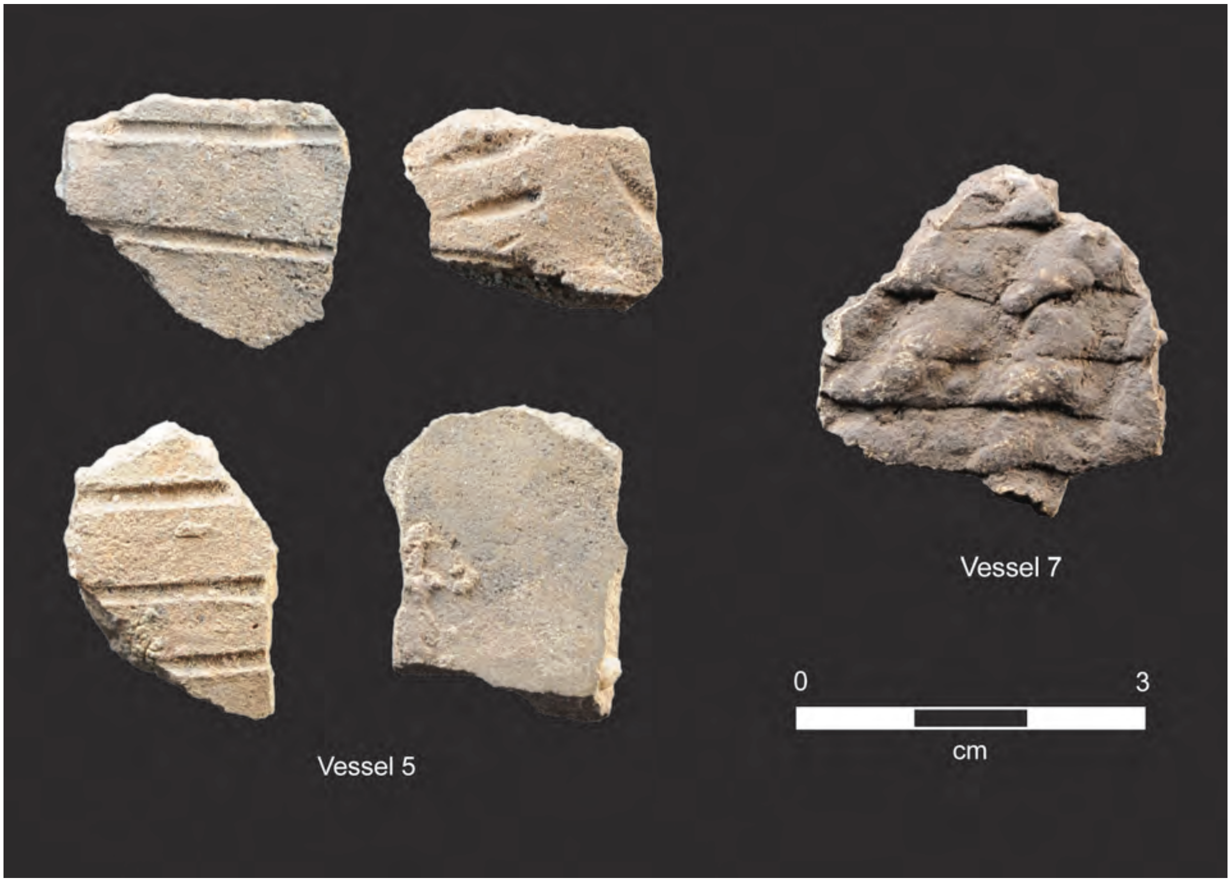



*Figure 2.36. Selected sherds from two pottery vessels collected in 2018. The Vessel 5 sherd on the lower right has been modified by surface grinding.*

Table 2.18. Summary data on pottery vessels.

| Vessel Number | No. of Sherds[a] | Mean Weight (g) | Mean Thickness (mm)[b] | Exterior Color | Paste Color | Surface Treatment | Decorative Technique |
|---|---|---|---|---|---|---|---|
| 1 | 6 | 1.78 | 4.89 | 7.5YR 5/1 – 5/2 | 7.5YR 8/1 | Plain | None visible |
| 2 | 1 | 7.13 | 6.09 | 7.5YR 4/2 | 5YR 5/4 | Cord-roughened | None visible |
| 3 | 3 | 1.68 | 4.66 | 7.5YR 4/1 | 7.5YR 6/2 | Plain | None visible |
| 4 | 6 | 4.45 | 6.07 | 7.5YR 5/4 | 10YR 3/1 | Plain | Incised |
| 5 | 11(1) | 3.53 | 5.97 | 7.5YR 4/3 – 5/3 | 7.5YR 4/3 | Plain | Incised, punctate |
| 6 | 2 | 2.32 | 4.60 | 7.5YR 4/1 – 4/2 | 10YR 2/1 | Plain | Incised? |
| 7 | 1(1) | 4.08 | 5.31 | sediment stained | 10YR 7/3 | Indented corrugated | None visible |

[a] Number of possibly associated sherds given in parentheses.
[b] Derived from minimum and maximum sherd thickness measurements.

2.36). A second sherd from that test unit may represent the same vessel. Together the two sherds weigh 8.2 g. Each exhibits partially smeared indented corrugated exterior surfaces. Mean vessel wall thickness is 5.3 mm. Paste is buff to light gray and contains poorly sorted angular crushed rock temper. Temper minerals include vitric tuff. Exterior and interior surface colors are obscured by dark sediment staining; however, a thin slip or wash may occur on the interior of one sherd.

Vessel 7 may be assignable to the Jemez Smeared/Indented Corrugated type produced on the Pajarito

Plateau between about A.D. 1250 and 1550 (OSA 2020b).

Lead Ball

During examination of the CMT5, a probable lead ball was observed embedded in the scar surface (figure 2.37). Based on the weathered wood fibers adjacent to the ball, it appears to have been embedded some time ago. The ball was photographed in situ prior to being extracted using a flat-headed screwdriver to pry it out from both sides.

The ball is 1.54 cm in maximum width and 1.2 cm in maximum thickness (figure 2.38). It weighs 218.75 grains. This weight suggests a caliber of between .50 and .55; possibly a .52 caliber (Phil Born personal communication 2018). It was noted when examining the ball with a hand lens that it exhibits several small lumps of lead on the left edge (as originally embedded in the tree). These bumps of lead appear to be sprue from the molding process that was not completely cut off.

The pitch on the surface of the ball was not removed in the lab in order to document the shape as it was originally found embedded in the trunk. The pitchy area visible on the ball was the portion that was embedded in the wood. It was noted prior to extracting the ball that some of the wood fibers around the top edge of the ball appear to be angled outward (figure 2.37), possibly suggesting that the ball was exiting rather than entering the tree when it became embedded. Based on discussions with Phil Born (personal communication 2018), a .52 caliber ball would likely not have the velocity to penetrate a large diameter tree such as CMT5. In addition, the surface of the ball that was embedded against the trunk was slightly flattened while the outer, surface-visible portion was more rounded, supporting the idea that it was entering the tree and not exiting.

When and exactly why this ball was shot into the tree are not known. It seems most likely that the ball was embedded in the tree after the scarring and chopping occurred, but this could not be verified. The ball could have been embedded as a missed shot during hunting or possibly was embedded during target practice. For example, there are a number of CMTs located in the San Juan National Forest at the Target Tree Campground where Native Americans have described using the tree scars for target practice.

*Figure 2.37. Close-up of the lead ball embedded into the scar of CMT5. (Photo courtesy of Marilyn Martorano.)*

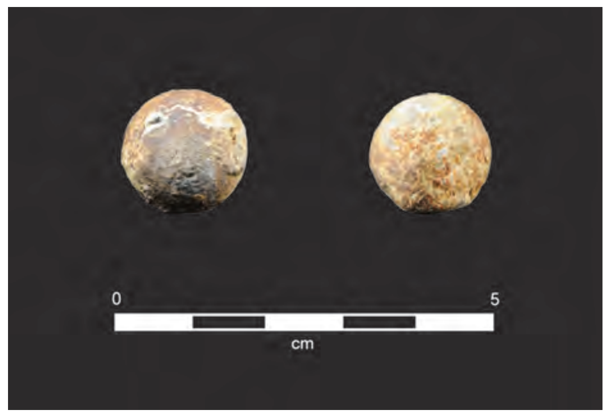



*Figure 2.38. Two views of the lead ball extracted from CMT5. View on the left is the side visible in figure 2.37.*

Discussion

Data on modified stone and pottery artifacts from La Botica offer insights on the range of activities carried out at the site and on the chronology of occupation. Ground stone tools make up 70 percent of the 2018 tool assemblage, indicating that plant processing was a major focus of the indigenous people who occupied La Botica. The provenance of the raw materials used to make these tools is not known, although it is likely that both locally available and transported materials were used. The presence of intact, usable millingstones and handstones suggests that grinding tools were cached at the site in anticipation of future use. As detailed later in the "Summary of Results" section, the wide distribution of ground stone tools within the 2018 survey blocks indicates that they were used during multiple occupations, including those that occurred during both the Archaic stage and the Late Prehistoric stage.

The small chipped stone tool assemblage is dominated by projectile points, most of which are represented by proximal (haft) fragments. This pattern suggests that re-tooling, rather than hunting, was a primary activity. Other tasks represented by the chipped stone tool assemblage include general cutting and scraping activities and stone tool production and maintenance. The latter likely focused on mid- to late-stage tool finishing and routine tool repair and re-purposing rather than primary production. The large estimated size of the site's flaking debris assemblage likely is a product of the number of occupations, rather than their intensity.

A wide variety of lithic raw materials are represented in the flaking debris and chipped stone tool assemblages. Toolstone from known sources includes orthoquartzite from Trickle Mountain (Alkali Creek) located roughly 100 km to the north, obsidian from the Valles Caldera 150 km to the south, and chert from Cumbres Pass 25 km to the southwest. Other raw materials include rhyolite possibly from a source in English Valley 65 km to the north and basalt (dacite) from San Antonio Mountain or other sources in the Taos Plateau Volcanic Field. This distribution suggests that La Botica's occupants came to the site from multiple directions.

Eight of the 11 projectile points documented in 2018 are dart points that were produced during the Archaic stage. The oldest is a Jay-style point that may date to the Early Archaic (8000 – 5000 B.P.). Dart points possibly dating to the Late Archaic are somewhat better represented than those dating to the Middle Archaic; however, both periods are well represented. Two arrow points dating to the Late Prehistoric were documented. The number of occupations, or the length of the intervals between them, is not known.

All of the observed pottery consists of culinary or utility ware sherds that were produced elsewhere and transported to La Botica. Although not surprising given the site's distance from permanent settlements, this pattern indicates that the pottery was used on-site for a food processing or culinary task. Pottery may also have been used to transport water to the site from La Jara Creek. Although the specific task is not known, the prevalence of ground stone tools at the site suggests that pottery vessels may have been used for processing or preparing seeds, leaves, or other plant parts.

Although some of the pottery at La Botica could have been produced as late as the eighteenth century, most and perhaps all of the observed vessels appear to have been produced between about A.D. 1100 and 1450. Northern Tiwa pottery from the Taos Valley is best represented. Pottery produced in the Southern Plains is also represented, as is pottery that may have been produced on the Pajarito Plateau and in portions of the Northern Rio Grande outside the Taos Valley.

## Summary of Results

The 2018 field investigation generated data important for understanding La Botica's history of occupation as well as the processes affecting its archaeological deposits.

### Geomorphology and Site Impacts

Primary deposition of fine-grained deposits occurred during the Late Pleistocene and Early Holocene. At least within the site's central hydrologic basin a stable, well-vegetated surface was present until about 8500 cal B.P. Sometime after that, surface erosion began to transport additional sediment into the basin, burying the 8500 B.P. surface. Erosion also stripped away basin sediment located south and east of the bedrock dam that bisects the basin. However, surface data from other portions of the site, as well as subsurface data from Unit 4, indicate that deposition and subsequent soil formation also occurred after the site was first occupied during the Early to Middle Holocene. Widespread erosion of the site's surface likely had taken place by about 700 years ago or soon thereafter.

Today, most of the site's archaeological deposits have been stripped away by aeolian erosion and surface flow. Remnant sections of intact soil occur on the southern edge of the site close to the blockfield. Isolated patches of A horizon sediment also are held in place by woody vegetation. Surface erosion, consisting primarily of sheetwash, is currently most active within and north of the Block 3 survey area.

Owing to the extent of surface erosion, artifacts currently present on the site surface are no longer in context. The few hearths identified during 2018, notably Feature 5 in Block 1, are mostly or wholly deflated. Intact archaeological deposits do occur in the vicinity of Unit 4 and in a narrow strip adjacent to the toe of the blockfield north and south of Unit 4.

### Occupation History and Site Function

Artifacts documented during 2018 point to intermittent occupation at La Botica throughout the Middle and Late Holocene. The presence of a wide variety of dart point types indicates recurrent occupation during the Middle and Late Archaic periods. Arrow points and pottery indicate continued occupancy during the Late Prehistoric, especially between about 500 and 1,000 years ago. Peeled ponderosa pines point to indigenous site use during the eighteenth or nineteenth centuries. A small assemblage of recent metal artifacts represents a brief occupation dating to the first third of the twentieth century.

Data on the stone tool types present in the assemblage indicate a primary focus by the site's Native American occupants on plant processing, along with a secondary focus on tool kit refurbishment and late-stage tool production. However, spatial data on projectile points, flaking debris, and pottery indicate that different parts of the site were used during different periods. La Botica's Archaic occupants appear to have used most of the site. A concentration of likely Archaic-stage artifacts occurs on the west end of the Block 1 survey area. By contrast, the site's Late Prehistoric occupants appear to have focused their activities along the toe of the blockfield on the site's southern perimeter.

Pottery data and stone tool raw material data indicate that many different American Indian groups used La Botica's resources, including Pueblo communities, Plains groups, Ute bands, and others. This suggests that the plants that were the site's most important resource were valued equally by a diverse group of indigenous peoples.

The presence of recent historical artifacts points to use of the site by local San Luis Valley residents in the twentieth century. The functional characteristics of the assemblage point to a camp occupation of modest duration, but the specific activities undertaken are not known. Whether the people who camped at the site in the early twentieth century were also drawn to the site's plant resources cannot be determined from the available archaeological data.

## Notes

[1] The La Botica site is owned and managed by two state agencies, the Colorado State Land Board and Colorado Parks and Wildlife. The 2018 archaeological investigation was conducted under State of Colorado Archaeological Permit No. 74151, which included a curation agreement for housing collected artifacts. Subsequently, History Colorado's State Curation Coordinator Todd McMahon arranged to have the 2018 collection, which the state owns, deposited in the curation facility at Great Sand Dunes National Park and Preserve. Multiple collections from the site, which were made when it was partially managed by the Bureau of Land Management, already are housed at Great Sand Dunes.

# 3

# Summary and Recommendations

Indigenous Americans first visited the La Botica site at least 8,000 years ago, judging by the presence there of a distinctive Early Archaic projectile point. A striking variety of temporally diagnostic hunting weapons and pottery vessel fragments also occurs at the site, testifying to native use throughout the Middle and Late Holocene. The presence of culturally modified trees indicates occupancy in the eighteenth or nineteenth centuries. No other documented site in the San Luis Valley preserves a record of use spanning such a long period, making La Botica a critical resource for understanding stability and change in American Indian mobility and subsistence practices.

In addition to its importance for understanding Native American land use, La Botica is also important for understanding local Hispano traditions. La Botica is the only documented medicinal plant-gathering locality in the region and so is critical for understanding San Luis Valley folk medicine practices. Archaeological data can help define the nature and chronology of recent site use and thereby lead to a more comprehensive understanding of local traditions.

### Project Overview

To marshal data on La Botica's function, history of occupation, and cultural affiliation, and on the processes currently affecting its archaeological deposits, Paleocultural Research Group (PCRG), a nonprofit research and education organization, conducted a nine-day archaeological field investigation at the site in 2018. A total of 20 people, including professional archaeologists and citizen-science volunteers, participated in the project. The work focused primarily on surface inventories, including a flaking debris density survey and

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2020 *Archaeological Research During 2018 at the La Botica Site, Conejos County, Colorado,* by Mark D. Mitchell, pp. 59-62. Research Contribution 114. Paleocultural Research Group, Broomfield, Colorado.

an intensive artifact survey. Various datasets were collected on projectile points and other stone tools, pottery sherds, and recent metal artifacts. Data were also collected on culturally modified trees (CMTs). Limited subsurface testing was undertaken to gather data on local geomorphic processes and on near-surface cultural features. Twenty-nine pottery sherds and a lead ball were collected from the surface and a small assemblage consisting of flakes, pottery sherds, and a single stone tool was collected from excavated contexts. These materials, which are owned by the State of Colorado, are by agreement with History Colorado curated at the Great Sand Dunes National Park and Preserve curation facility, along with federally owned materials previously collected from the site.

La Botica is located on land jointly managed by the Colorado State Land Board and Colorado Parks and Wildlife, both divisions of the Colorado Department of Natural Resources. Major funding for the field investigation was provided by a History Colorado – State Historical Fund grant awarded to PCRG (No. 2018-02-039). Supplemental funding was provided by the Sangre de Cristo National Heritage Area, the Colorado State Land Board, and Colorado Parks and Wildlife.

## Site Formation Processes and Current Condition

La Botica is located on a high strath terrace in the La Jara Canyon in central Conejos County, Colorado. Covering roughly 15 ha (37 acres), the site completely encompasses the surface of the terrace remnant, which is perched some 110 m below the canyon rim and 85 m above the floodplain of the creek. The east and south sides of the site are bounded by active blockfields, while the north and west sides are defined by the valley-side margin of the terrace.

Apart from a small portion of the site's western end, the upper surface of the terrace has no modern hydrologic connection to La Jara Creek; precipitation that falls on the terrace drains toward a central depression or basin where it infiltrates or evaporates.

Deposition of fine-grained sediment on the terrace occurred during the Late Pleistocene and Early Holocene. At least within the site's central hydrologic basin a stable, well-vegetated surface was present until about 8500 cal B.P. Sometime later, surface erosion began to transport sediment from the surrounding area into the basin, burying the 8500 B.P. surface. However, multiple lines of evidence indicate that deposition and subsequent soil formation also occurred after the site was first occupied by Native Americans during the Early to Middle Holocene. Nevertheless, by about 700 years ago, or soon thereafter, widespread erosion of the site's surface had occurred.

Today, most of the site's archaeological deposits have been stripped away by aeolian erosion and sheetwash. Remnant sections of intact surface soil occur on the southern margin of the site close to the toe of the blockfield. In addition, isolated patches of A horizon sediment located throughout the site are held in place by woody vegetation. Surface erosion is currently most active immediately south of the site's central basin.

Owing to the extent of surface erosion, artifacts currently present on the site surface are no longer in context. The few hearths identified during 2018 are mostly or entirely deflated. Intact archaeological deposits do occur in a narrow strip adjacent to the toe of the blockfield and may also be present on the site's southwestern edge. The extent of intact deposits cannot be precisely estimated from the available data, but likely amounts to less than 20 percent of the mapped site area.

The presence of a small number of late twentieth- or early twenty-first century artifacts points to periodic recent visitation, possibly by recreational hunters. At least four "collector's piles" of flakes and chipped stone tools—likely indicative of casual artifact collecting—were observed during the 2018 field investigation.

## Site Function

Data on the stone tool types present in the assemblage indicate a primary focus by the site's Native American occupants on plant processing, along with a secondary focus on tool kit refurbishment and late-stage tool production.

Fifty-nine of the 84 stone tools documented in 2018 are ground stone tools. The presence of intact, usable millingstones and handstones suggests that grinding tools were cached at the site in anticipation of future use. The small chipped stone tool assemblage is dominated by projectile points, most of which are represented by proximal (haft) fragments. This pattern suggests that re-tooling of hunting gear, rather than hunting itself, was an important activity. Other tasks represented by the chipped stone tool assemblage include general cutting and scraping activities and stone tool production and maintenance.

The inventory of non-diagnostic chipped stone tools includes 10 biface fragments, six unpatterned flake tools, five scrapers, three cores, and one fragment of a projectile point blade. Most of the bifaces are represented by edge fragments exhibiting general use wear. One of the bifaces may be a projectile point tip and another may be a drill base; however, both are too fragmented to determine their original morphology or function. Two other fragments likely represent early-stage bifaces.

Overall, the American Indian tool assemblage is indicative of a limited range of activities apart from plant processing. Represented activities include mid- to late-stage tool finishing and routine tool repair and re-purposing. The site's recent historical artifact assemblage is too small to draw specific functional interpretations.

All of the pottery observed in 2018 consists of utility ware sherds that were produced elsewhere and transported to La Botica. Although not surprising given the site's distance from permanent settlements, this pattern indicates that the pottery was brought to the site for a plant processing or culinary task. Pottery may also have been used to transport water to the site from La Jara Creek. Although the specific tasks for which the pottery vessels were used are not known, the prevalence of ground stone tools at the site suggests that pottery may have been used for processing or preparing seeds, leaves, or other comestible or medicinal plant parts.

Despite the evidence for a consistent functional emphasis on plant processing, spatial data on projectile points, flaking debris, and pottery indicate that different parts of the site were used during different periods. La Botica's Archaic occupants appear to have used most of the site area. A concentration of artifacts likely dating to the Archaic stage occurs immediately north of the site's central basin. By contrast, the site's Late Prehistoric occupants appear to have focused their activities along the toe of the blockfield on the site's southern perimeter.

**Occupation History and Cultural Affiliation**

Although artifact density estimates indicate that thousands of flakes are present at La Botica, the stone tool data suggest that the size of the assemblage is primarily a product of the number of occupations, rather than their intensity.

While the number of separate occupations is not known, nor are the lengths of the intervals between them, it is clear that the overall occupation span is about 8,000 years. Eight of the 11 projectile points documented in 2018 are dart points that were produced during the Archaic stage. The oldest is a Jay-style point that may date to the Early Archaic (8000 – 5000 B.P.). Dart points possibly dating to the Late Archaic are somewhat better represented than those dating to the Middle Archaic; however, both periods are well represented. Two arrow points dating to the Late Prehistoric were documented. Both are side-notched forms produced after about A.D. 1150. Notably absent are corner-notched arrow points, suggesting a possible occupational hiatus during the first millennium.

A wide variety of lithic raw materials are represented in the flaking debris and chipped stone tool assemblages. Materials from known quarries include orthoquartzite from Trickle Mountain (Alkali Creek) located roughly 100 km to the north, obsidian from the Valles Caldera 150 km to the south, and chert from Cumbres Pass 25 km to the southwest. Other raw materials include rhyolite possibly from a source in English Valley 65 km to the north and basalt (dacite) from San Antonio Mountain or other sources in the Taos Plateau Volcanic Field. This distribution suggests that the people who came to La Botica did so from multiple directions.

While some of the pottery observed at La Botica could have been produced as late as the eighteenth century, most and perhaps all of the documented vessels appear to have been manufactured between about A.D. 1100 and 1450. Taos Gray pottery produced by Northern Tiwa potters is the best represented type. Pottery produced in the Southern Plains is also represented, as is pottery that may have been produced on the Pajarito Plateau and in portions of the Northern Rio Grande outside the Taos Valley. These data indicate that both Pueblo and Plains groups came to La Botica. The presence of several peeled ponderosa pines suggest that Utes or Jicarilla Apaches also occupied the site. The cultural identities of the site's Archaic-stage occupants are not known.

Data on historic artifacts observed in 2018 indicate limited use of the site for habitation during the early twentieth century. A single occupation, or a short series of brief occupations, is indicated, possibly by San Luis Valley sheep herders.

**National Register of Historic Places Eligibility**

The La Botica site (5CN1061) currently is listed on the State Register of Historic Properties (SRHP) as a contributing resource to the La Jara Archaeological District (5CN1418) and is officially eligible for the National Register of Historic Places (NRHP) under criteria A and D.

Although the site surface is extensively eroded, and erosion is ongoing in portions of the site, it is nevertheless likely that intact archaeological deposits occur within the site boundary. Despite a history of casual surface collection, numerous temporally diagnostic artifacts remain. Moreover, the pristine environment of the La Jara Canyon has preserved the site's integrity of location, setting, feeling, and association.

The likely presence of subsurface cultural materials indicates that La Botica retains the capacity to provide additional information important to the ancient history of the Rio Grande basin generally and of the San Luis Valley and Eastern San Juan Mountains specifically. Relevant historic themes include change and stability in Native American mobility and subsistence practices and specialized exploitation of botanical resources.

Previously collected ethnographic data indicate that La Botica is just one among many medicinal plant gathering localities in the San Luis Valley (e.g. Bye and Linares 1986). Archaeological data obtained during the 2018 investigation indicate that the site's indigenous occupants focused their use on the collection and processing of plant resources, possibly including the same medicinal and comestible species targeted by later Hispano visitors. In addition, the La Jara Canyon area of western Conejos County may hold special cultural significance for several American Indian tribes. Archaeological sites as well as natural landscape features in this area may embody important cultural traditions that are also reflected in songs, stories, and other cultural practices.

## Ongoing Research and Management Recommendations

PCRG's research affiliates continue anthropological and ecological investigations that will provide additional context for understanding the archaeology of La Botica. Current projects include a geological and geomorphological investigation, ethnobotanical documentation, a botanical inventory, and multiple paleoenvironmental investigations. The ethnobotanical documentation project involves work with both local Hispano and Native American consultants. Ongoing paleoenvironmental research includes studies of tree rings, woodrat middens, and high-altitude lake sediment.

Owing to the extent of ongoing surface erosion, La Botica should be periodically monitored to identify recently exposed archaeological deposits or features. Mitchell (2020) recommends a monitoring interval of six years, along with standards and processes for condition assessments and procedures for mitigating or offsetting documented damage. Access to the site should continue to be restricted to prevent casual surface collection.

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# Appendix A:
# Field Catalog and Inventory of Collected Artifacts

Table A.1. Catalog variables and codes.

| | |
|---|---|
| CN | Provenience- and recovery-based catalog number assigned by PCRG |
| Unit | Excavation unit number |
| Fea. | Feature number assigned in the field |
| Local Grid North | Local grid northing of southwest corner of excavation unit (m) |
| Local Grid East | Local grid easting of southwest corner of excavation unit (m) |
| UTM Position North | UTM (NAD83) northing of plotted surface specimen or southwest corner coordinate of test unit (m) |
| UTM Position East | UTM (NAD83) easting of plotted surface specimen or southwest corner coordinate of test unit (m) |
| Sample Type | GL=general level; FL=feature level; PP=piece plot; US=surface collection; SS=sediment sample |
| GL | General level number |
| FL | Feature level number |
| Top | Beginning depth of excavation level (surface depth in cm) |
| Bottom | Ending depth of excavation level (surface depth in cm) |
| Plot N | Northing of excavated plotted artifact or specimen within excavation unit (cm) |
| Plot E | Easting of excavated plotted artifact or specimen within excavation unit (cm) |
| Plot V | Depth of excavated plotted artifact or specimen within excavation unit (cm) |
| Recovery Method | PL=plotted (surface or excavated); DS4=1/4-in mesh dryscreen; DS8=1/8-in mesh dryscreen; BK=bulk collection |
| Excavator | Initials of excavator or surveyor |
| Date | Date of recovery |

Table A.2. Artifact inventory variables and codes.

| | |
|---|---|
| CN | Provenience- and recovery-based catalog number assigned by PCRG |
| Unit | Excavation unit number |
| Fea. | Feature number assigned in the field |
| Pottery | Number of sherds |
| Stone Tools | Number of stone tools |
| Flakes | Number of flakes |
| FCR | Weight of fire-cracked rock (g) |
| Charcoal | Number of charcoal samples |
| Unsorted Residue | Weight of unsorted residue samples (g) |
| Light Fraction | Weight of light fraction samples (g) |
| Other | Number of other artifacts or samples |

Table A.3. Field provenience catalog.

| CN | Unit | Fea. | Local Grid | | UTM Position | | Sample Type | GL | FL | Top | Bottom | Plot | | | Recovery | Excavator | Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | North | East | North | East | | | | | | N | E | V | | | |
| 1001 | | | | | [Redacted] | | US | | | | | | | | PL | BVR | 6/10/2018 |
| 1002 | | | | | | | US | | | | | | | | PL | BVR | 6/10/2018 |
| 1003 | | | | | | | US | | | | | | | | PL | BVR | 6/10/2018 |
| 1004 | | | | | | | US | | | | | | | | PL | BVR | 6/10/2018 |
| 1005 | | | | | | | US | | | | | | | | PL | BVR | 6/10/2018 |
| 1006 | | | | | | | US | | | | | | | | PL | BVR | 6/10/2018 |
| 1007 | | | | | | | US | | | | | | | | PL | BVR | 6/10/2018 |
| 1008 | | | | | | | US | | | | | | | | PL | BVR | 6/10/2018 |
| 1009 | | | | | | | US | | | | | | | | PL | MDM | 6/7/2018 |
| 1010 | | | | | | | US | | | | | | | | PL | MDM | 6/10/2018 |
| 1011 | | | | | | | US | | | | | | | | PL | MDM | 6/10/2018 |
| 1012 | | | | | | | US | | | | | | | | PL | MDM | 6/10/2018 |
| 1013 | | | | | | | US | | | | | | | | PL | MDM | 6/10/2018 |
| 1014 | | | | | | | US | | | | | | | | PL | MAM, KB | 6/6/2018 |
| 2001 | 1 | | 1050.52 | 1999.74 | | | GL | 1 | | 0 | 10 | | | | DS4 | KTH, SB, MF | 6/5/2018 |
| 2002 | 1 | | 1050.52 | 1999.74 | | | GL | 2 | | 10 | 20 | | | | DS4 | KTH, SB, MF | 6/6/2018 |
| 2003 | 4 | | 980.10 | 1977.32 | | | GL | 1 | | 0 | 10 | | | | DS4 | BVR, AH | 6/6/2018 |
| 2004 | 4 | | 980.10 | 1977.32 | | | GL | 2 | | 10 | 20 | | | | DS4 | BVR, AH | 6/6/2018 |
| 2005 | 1 | | 1050.52 | 1999.74 | | | GL | 3 | | 20 | 30 | | | | DS4 | KTH, SB, MF | 6/6/2018 |
| 2006 | 4 | | 980.10 | 1977.32 | | | GL | 3 | | 20 | 30 | | | | DS4 | BVR | 6/7/2018 |
| 2007 | 4 | | 980.10 | 1977.32 | | | PP | 3 | | 20 | 30 | 64 | 80 | 20 | PL | BVR | 6/7/2018 |
| 2008 | 4 | | 980.10 | 1977.32 | | | GL | 4 | | 30 | 40 | | | | DS4 | KTH | 6/9/2018 |
| 2009 | 4 | | 980.10 | 1977.32 | | | PP | 4 | | 30 | 40 | 67 | 0 | 38 | PL | KTH | 6/9/2018 |
| 3001 | 3 | | 993.00 | 1797.00 | | | GL | 1 | | 0 | 20 | | | | DS4 | MAM | 6/5/2018 |
| 3002 | 2 | | 968.00 | 1838.00 | | | GL | 1 | | 0 | 20 | | | | DS4 | BVR, GAW | 6/5/2018 |
| 3003 | 2 | | 968.00 | 1838.00 | | | GL | 2 | | 20 | 40 | | | | DS4 | GAW, LDS | 6/6/2018 |
| 3004 | 3 | | 993.00 | 1797.00 | | | GL | 2 | | 20 | 40 | | | | DS4 | BH, JK | 6/6/2018 |
| 3005 | 2 | | 968.00 | 1838.00 | | | GL | 3 | | 40 | 60 | | | | DS4 | LDS, KEP | 6/6/2018 |
| 3006 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3007 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3008 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3009 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3010 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3011 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |

Table A.3. Field provenience catalog (*continued*).

| CN | Unit | Fea. | Local Grid | | UTM Position | | Sample Type | GL | FL | Top | Bottom | Plot | | | Recovery | Excavator | Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | North | East | North | East | | | | | | N | E | V | | | |
| 3012 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3013 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3014 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3015 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3016 | 2 | | 968.00 | 1838.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3017 | 3 | | 993.00 | 1797.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3018 | 3 | | 993.00 | 1797.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3019 | 3 | | 993.00 | 1797.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3020 | 3 | | 993.00 | 1797.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3021 | 3 | | 993.00 | 1797.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3022 | 3 | | 993.00 | 1797.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3023 | 3 | | 993.00 | 1797.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3024 | 3 | | 993.00 | 1797.00 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3025 | 4 | | 980.10 | 1977.32 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3026 | 4 | | 980.10 | 1977.32 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3027 | 4 | | 980.10 | 1977.32 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3028 | 4 | | 980.10 | 1977.32 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3029 | 1 | | 1050.52 | 1999.74 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3030 | 1 | | 1050.52 | 1999.74 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3031 | 1 | | 1050.52 | 1999.74 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 3032 | 1 | | 1050.52 | 1999.74 | | | SS | | | | | | | | BK | MDM | 6/10/2018 |
| 4001 | 5 | 1 | 917.00 | 1861.00 | | | FL | | 1 | 3 | 18 | | | | DS8 | KB, AH, BH, CK | 6/8/2018 |
| 4002 | 5 | 1 | 917.00 | 1861.00 | | | FL | | 2 | 3 | 18 | | | | DS8 | KB, AH, BH, CK | 6/8/2018 |
| 4003 | 6 | 2 | 876.50 | 1824.25 | | | FL | | 1 | 0 | 7 | | | | DS4 | CMJ | 6/8/2018 |
| 4004 | 5 | 1 | 917.00 | 1861.00 | | | PP | | 1 | | | 55 | 46 | 14 | PL | KB, AH, BH, CK | 6/8/2018 |
| 4005 | 5 | 1 | 917.00 | 1861.00 | | | PP | | 2 | | | 40 | 38 | 13 | PL | KB,AH, BH,CK | 6/8/2018 |
| 4006 | 6 | 2 | 876.50 | 1824.25 | | | PP | | 1 | | | 70 | 51 | 8 | PL | CMJ | 6/8/2018 |
| 4007 | 6 | 2 | 876.50 | 1824.25 | | | PP | | 1 | | | 47 | 64 | 5 | PL | CMJ | 6/8/2018 |
| 4008 | 6 | 2 | 876.50 | 1824.25 | | | PP | | 1 | | | 82 | 61 | 8 | PL | CMJ | 6/8/2018 |
| 4009 | 6 | 2 | 876.50 | 1824.25 | | | PP | | 1 | | | 41 | 51 | 7 | PL | CMJ | 6/9/2018 |
| 4010 | 6 | 2 | 876.50 | 1824.25 | | | FL | | 1 | 4 | 10 | | | | BK | CMJ | 6/9/2018 |
| 4011 | 5 | | 917.00 | 1861.00 | | | GL | 1 | | 1 | 11 | | | | DS4 | KDB | 6/9/2018 |

Table A.3. Field provenience catalog (*continued*).

| CN | Unit | Fea. | Local Grid | | UTM Position | | Sample Type | GL | FL | Top | Bottom | Plot | | | Recovery | Excavator | Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | North | East | North | East | | | | | | N | E | V | | | |
| 4012 | 6 | 2 | 876.50 | 1824.25 | | | PP | | 2 | | | 36 | 51 | 7 | PL | CMJ | 6/9/2018 |
| 4013 | 7 | 3 | 905.00 | 1844.50 | | | FL | | 1 | 1 | 12 | | | | DS8 | KDB | 6/9/2018 |
| 4014 | 6 | 2 | 876.50 | 1824.25 | | | PP | | 2 | | | 14 | 64 | 8 | PL | CMJ | 6/9/2018 |
| 4015 | 5 | | 917.00 | 1861.00 | | | GL | 2 | | 11 | 21 | | | | DS4 | KDB | 6/9/2018 |
| 4016 | 6 | | 876.50 | 1824.25 | | | GL | 1 | | 0 | 10 | | | | DS4 | CMJ | 6/9/2018 |
| 4017 | 7 | 3 | 905.00 | 1844.50 | | | PP | | 1 | | | 25 | 61 | 4 | PL | BVR, KB | 6/9/2018 |
| 4018 | 7 | 3 | 905.00 | 1844.50 | | | PP | | 1 | | | 43 | 61 | 9 | PL | BVR, KB | 6/9/2018 |
| 4019 | 7 | | 905.00 | 1844.50 | | | GL | 1 | | 1 | 13 | | | | DS4 | KB, CJ | 6/10/2018 |
| 4020 | 6 | | 876.50 | 1824.25 | | | PP | 1 | | 3 | 12 | 36 | 92 | 9 | PL | BVR, GW | 6/10/2018 |

Table A.4. Inventory of collected artifacts.

| CN | Unit | Fea. | Pottery | Stone Tool | Flakes | FCR | Charcoal | Unsorted Residue | Light Fraction | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| 1001 | | | 1 | | | | | | | |
| 1002 | | | 1 | | | | | | | |
| 1003 | | | 1 | | | | | | | |
| 1004 | | | 1 | | | | | | | |
| 1005 | | | 1 | | | | | | | |
| 1006 | | | 1 | | | | | | | |
| 1007 | | | 1 | | | | | | | |
| 1008 | | | 2 | | | | | | | |
| 1009 | | | 6 | | | | | | | |
| 1010 | | | 11 | | | | | | | |
| 1011 | | | 1 | | | | | | | |
| 1012 | | | 1 | | | | | | | |
| 1013 | | | 1 | | | | | | | |
| 1014 | | | | | | | | | | 1 (lead ball) |
| 2001 | 1 | | | | 12 | | | | | |
| 2002 | 1 | | | | 1 | | | | | |
| 2003 | 4 | | 2 | | 2 | 2.9 | | | | |
| 2004 | 4 | | | | 1 | | | | | |
| 2006 | 4 | | | | 2 | | | | | |
| 2007 | 4 | | | | | 69.2 | | | | |
| 2009 | 4 | | | | 1 | | | | | |
| 3001 | 3 | | | | 1 | | | | | |
| 3002 | 2 | | | 1 | | | | | | |
| 3003 | 2 | | | | 1 | | | | | |
| 3004 | 3 | | | | 2 | | | | | |
| 4001 | 5 | 1 | | | 1 | | | | | |
| 4003 | 6 | 2 | | | 1 | | | | | |
| 4004 | 5 | 1 | | | | | 1 | | | |
| 4005 | 5 | 1 | | | | | 1 | | | |
| 4006 | 6 | 2 | 1 | | | | | | | |
| 4007 | 6 | 2 | | | 1 | | | | | |
| 4008 | 6 | 2 | | | 1 | | | | | |
| 4009 | 6 | 2 | | | | | 1 | | | |
| 4010 | 6 | 2 | | | | | | | | 1 (natural rock); G3 |

Table A.4. Inventory of collected artifacts (*continued*).

| CN | Unit | Fea. | Pottery | Stone Tool | Flakes | FCR | Charcoal | Unsorted Residue | Light Fraction | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| 4010 | 6 | 2 | | | | | | 176.2 | 19.8 | 2 (burned organic and burned bone); G4 |
| 4010 | 6 | 2 | | | | | | 194.7 | 13.6 | 2 (burned organic and <G5 not sorted residue); G5 |
| 4011 | 5 | | | | 2 | | | | | |
| 4012 | 6 | 2 | | | | | 1 | | | |
| 4014 | 6 | 2 | | | | | 1 | | | |
| 4015 | 5 | | | | 1 | | | | | |
| 4017 | 7 | 3 | | | 1 | | | | | |
| 4018 | 7 | 3 | | | | | 1 | | | |
| 4020 | 6 | | | | | | 1 | | | |

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