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Prehistory In The Calamity Creek Valley Brewster County, Texas

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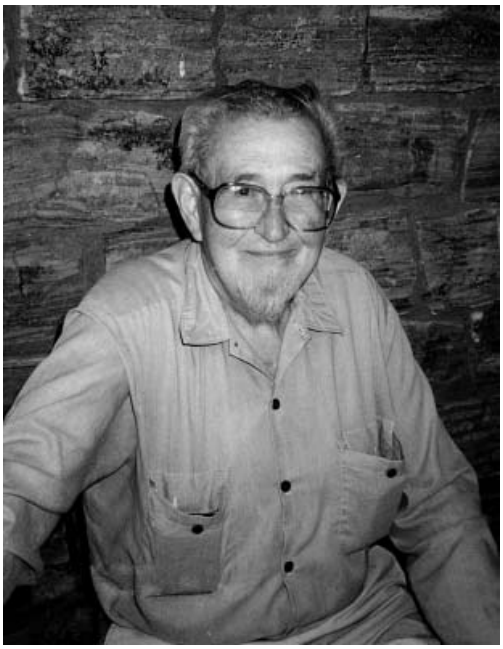

J. Charles Kelley on the porch of the Elephant Mountain WMA bunkhouse in June 1996. Photo: Robert J. Mallouf

This volume is dedicated to the memory of

J. Charles Kelley

Pioneer Big Bend Archaeologist
and
Director of the Peabody Museum-Sul Ross State Teachers College
Big Bend Expedition of 1938

Susan Chisholm, Editor
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Abstract

The findings of a May 28–July 2, 1996, summer archaeological field school conducted by the Center for Big Bend Studies, Sul Ross State University, in cooperation with the Texas Parks and Wildlife Department, are reported herein. The focus of the field school was on a 335-acre segment of the Calamity Creek valley within Elephant Mountain Wildlife Management Area in Brewster County, Texas. Twelve archaeological sites, 41BS37, 41BS764, 41BS810, 41BS811, 41BS814, 41BS1104, 41BS1480, 41BS1481, 41BS1482, 41BS1483, 41BS1484, and 41BS1485—six of which were previously identified—were instrument-mapped, subjected to controlled surface-collecting, and limited subsurface testing. All excavation was directed towards intrasite cultural features exposed and threatened by sheet erosion and/or cutbank sloughing. Evidence for largely transitory Late Paleoindian through Contact period occupation of the creek valley was recovered. Based on all gathered data, the narrow Calamity Creek basin is likely to have served in prehistory as a resource-rich north-south corridor through which small bands of hunter-gatherers passed at frequent intervals between two major physiographic zones. Artifacts and special samples recovered as a result of this project are curated at Texas Parks and Wildlife facilities in Austin, Texas.

Acknowledgements

The 1996 Sul Ross State University (SRSU) summer archaeological field school, under the direction of Robert J. Mallouf, was a cooperative effort of Center for Big Bend Studies (CBBS) and Texas Parks and Wildlife Department (TPWD) personnel. Clay Brewer, then manager of the Elephant Mountain Wildlife Management Area (WMA), along with staff member Ellen Myers provided substantive logistical support throughout the duration of the project. J. David Ing, past regional archaeologist with TPWD, assisted in numerous aspects of the field school and delivered an evening program to participants and visitors. Mike Davis, then a field archaeologist with TPWD, assisted us in relocating several previously recorded archaeological sites and shared his knowledge of area archaeology with us.

The field school was made possible by the dedicated efforts of many folks, several of whom are no longer with us today. The authors extend their gratitude to the student participants of the field school for their hard work and perseverance through the hottest part of a Big Bend summer: Marty Estrada, J.B. McHam, Kirsten Lund, Lourene Barron, Mike Shirey, Linda Potter, Allison Mohsin, Greg Hanson, and Robert Dopson. Appreciation is extended to William A. Cloud and Ruth Marie, who served as field assistant and laboratory director, respectively. The exceptional camp culinary skills of Helen Harrell were a daily delight for us all, and Curt Harrell provided yeoman service as assistant cook and official field school photographer.

Bringing a long-shelved project back to light can be a daunting experience, and the authors' efforts were bolstered by the professional skills of scientific illustrator Letitia Wetterauer, editor Susan Chisholm, and David Hart, who generated publishable renditions of our field site maps; all three were past staff members of the CBBS. Bryon Schroeder, director of the CBBS, provided encouragement and support throughout the report preparation. Locke Ann McIvor of the CBBS assisted with laboratory tasks and photography.

Sul Ross State University visitors to the field school included David Cockrum, past provost and vice-president for academic affairs; Bob Hext, professor of art; Jim Richerson, professor of biology; Barbara Richerson, photographer and journalist; and Rena and Nelda Gallego, administrative staff. In addition, Kevin Urbanczyk, professor of geology, brought his SRSU summer geology field school participants to Calamity Creek for a day of collaboration on the Elephant Mountain WMA.

Other welcome visitors included archaeologists Pat Mercado-Allinger and Brett Cruse of the Texas Historical Commission, and Lynn Loomis, soil scientist and long-time Big Bend researcher, who took the field school participants on a walking tour of Calamity Creek cutbanks while sharing his knowledge of area alluvial processes. Geoarchaeologist Rolfe Mandel of the University of Kansas visited the project locale shortly after fieldwork was completed and sampled stratigraphic sequences in both Calamity and Sheep creeks.

We are indebted to several other scientists and specialists who provided evening programs to the field school, including rock art specialist Bob Hext, archaeologist J. David Ing, fiber artifact replicator Rebecca Vogt, archaeologist William A. Cloud, and cultural geographer Paul Wright.

And finally, the field school was especially pleased to have a visit from archaeologists J. Charles and Ellen Kelley. The opportunity to discuss our project and share reminiscences with J. Charles, a Big Bend archaeological pioneer who conducted seminal research at Elephant Mountain in 1937 and 1938, was an honor and privilege enjoyed by all.

Robert Mallouf and Erika Blecha May 2020

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Sites Investigated During 1996 Field School

Introduction

The 1996 summer archaeological field school at Elephant Mountain Wildlife Management Area (Elephant Mountain WMA) was only the second such course offered by Sul Ross State University (SRSU) throughout its 76-year history. Four years earlier, in June and July 1992, the university had partnered with the Texas Historical Commission, Office of the State Archeologist, to carry out its first formal archaeological field school at the Arroyo de las Burras site, a late prehistoric Cielo complex encampment in the La Junta de los Ríos area downstream from Presidio, Texas (Mallouf 1995). The focus of instruction during the 1992 school was controlled mapping and scientific excavation, and the entire field school effort was expended on a single archaeological site. In contrast, the 1996 school was designed to provide a broader spectrum of field and laboratory experience for the participants by including aspects of site reconnaissance, intensive survey, soil studies, and techniques of subsurface testing and evaluation.

For a variety of reasons, the Elephant Mountain WMA proved to be a good choice for the 1996 field school instruction. The Calamity Creek valley is a largely depositional environment having massive, stratified alluvial sediments that are representative of great antiquity—an excellent backdrop for the study and teaching of the relationship between geomorphology, soil science, and archaeology. In addition, the narrow configuration of the valley provides an easily accessible cross section of the area's biotic microenvironments for comparative analysis of archaeological sites, features, and material content. Similarly, the WMA's physiographic position at the southern end of the Davis Mountains, and at the corresponding northern edge of the extensive Green Valley grassland, constitutes a significant ecotonal setting of interest to archaeological research. In sum, these positive factors were recognized by current and earlier researchers who focused their projects in the Elephant Mountain/Calamity basin/Chalk Draw area of the Big Bend as well.

The year 1996 saw a great deal of planning and research activity on the Elephant Mountain WMA. A desert bighorn sheep restoration program, initiated by Texas Parks and Wildlife Department (TPWD) in 1987, was in full swing and, having proved

successful, was considered a highest priority among WMA personnel. A number of other projects were under consideration as well, among them the creation of a primitive campsite for the public in the northwestern section of the refuge. An area on the east side of Calamity Creek was a tentative selection for the campsite, but it necessitated an archaeological evaluation as required by the Texas Antiquities Code. Since the timing of this Cultural Resources Management (CRM) project was consistent with that of the archaeological field school, it was decided by all parties to integrate the two complementary projects in the interest of both time and cost. A single Texas Antiquities Permit (#1702) was thus assigned for both the CRM campsite evaluation and for the SRSU summer archaeological field school.

Understandably, great care was being taken by WMA personnel to ensure the continued success of their desert bighorn sheep restoration effort. As a result, certain restrictions were applied specifically to the field school program and its participants:

> —Elephant Mountain proper and the buffer zone surrounding it, is off limits at all times. This includes all areas to the inside of the main road which travels around the mountain, and the area east or above the bunkhouse.
>
> —Permission is being granted to field school participants for archeological research purposes only . . . Hiking will be restricted to field school activities only and will be conducted as a class unit.
>
> —Vehicles are to remain on main roads only.
>
> *(Texas Parks and Wildlife Department 1996:2).*

The above restrictions served to limit field school access and activities in the WMA to the Calamity Creek basin proper on the west side of Elephant Mountain. The Chalk Draw drainage on the east side of the mountain, and the extensive summit of the mountain itself, were off limits. While such restrictions might appear detrimental to field investigations, the instructional focus of the field school meshed well with the Calamity Creek environs, and all stated goals of the fieldwork were, at least to some degree, achieved.

As stated above, the primary purpose of the field school was instructional rather than purely research oriented. Within this context, the stated Center for Big Bend Studies (CBBS) research goals of the field school were as follows:

> —To carry out archaeological reconnaissance along WMA drainages and terraces in order to locate and record a sample of area archaeological sites. This work will focus on the instrument and compass/tape mapping of sites and the detailed recording of associated cultural features such as ring middens and hearths. Detailed site mapping will be conducted prior to recovery of any temporally or functionally diagnostic artifacts from the surface of sites;

—To relocate and re-evaluate archaeological sites along Calamity and Sheep creeks that were subjected to investigation by J. Charles Kelley and T.N. Campbell during the late 1930s (Kelley, Campbell, and Lehmer 1940). Findings from this seminal, pre-WMA project suggest the presence of some early (Early to Middle Archaic) cultural deposits along these drainages, but their work was carried out before the advent of radiocarbon dating, making their findings inconclusive. An objective of the field school will involve relocating these cultural deposits (if they still exist) through cutbank examinations and sampling of the deposits to obtain datable organic materials;

—To recover datable organic samples from area paleosols. Several deeply buried paleosols are observable in cutbanks along Sheep and Calamity creeks on the west side of Elephant Mountain in the WMA. The dating of such deposits—particularly if they are determined to contain cultural content, is an important step to reconstructing past environments and ancient human lifeways in the study area;

—To carry out minor subsurface testing of selected cultural deposits along area drainages. While some buried deposits are currently known to exist in the study area, little is known concerning the context or content of such deposits. In most cases, test units will be restricted to eroding cut-bank exposures fronting the creek floors. Only those site deposits and cultural features that are currently subject to destruction by erosion (cutbank sloughing and/or sheet erosion) will be archaeologically investigated;

—To carry out mapping and subsurface evaluation of one archaeological site area that is currently being considered for primitive campground development by TPWD. Findings from this CRM-related aspect of the field school will be reported separately and prior to those from the overall field school project.

(Center for Big Bend Studies 1996).

The last objective listed above was actually the first work performed by field school personnel in late May 1996. As stipulated above, an archaeological evaluation of the proposed campsite development was completed during the remainder of the field school session and reported (Cloud 1996) as a separate project.

As regards the other objectives, the field school met with mixed success, largely as a result of time and funding constraints. Project funding was in short supply, thus severely limiting the number of radiocarbon assays that could be obtained from numerous charcoal samples recovered from buried paleosols and features in the arroyo cutbanks. Efforts to relocate and sample deeply buried sites that were excavated in the 1930s by J. Charles Kelley and T.N. Campbell were hindered by erosional restructuring of the arroyo walls and dense vegetation.

While one of Kelley's sites was found (Site 9:13), cursory efforts to relocate with confidence his Sheep Creek (Alpine 9:1a) and Calamity Creek (Alpine 9:1b) sites proved unsuccessful, and it quickly became apparent that appropriate funding for heavy equipment might be required to locate remnants of those deeply buried, and possibly long-since-destroyed deposits. However, a series of previously unreported deeply buried paleosols—some with attendant cultural material—did come to light as a result of field school efforts. And several cultural features, all impacted and endangered by erosional processes, were explored and documented—including a highly significant stone biface cache (Mallouf 2013). Finally, it should be emphasized that, in both project design and practice, a desire to avoid unnecessary damage to the WMA's archaeological resources permeated all work carried out by the field school team.

The Natural Setting

Located 42 km (26 mi) south of Alpine, Texas, and rising to an elevation of 1,897 m (6,224 ft) above mean sea level, Elephant Mountain forms a spectacular, mesa-like prominence with a long axis oriented approximately north-south (Fig. 1). The undulating summit of this remarkable regional landmark is some 12.4 sq. km (4.8 sq. mi) in extent and stands up

Figure 1. Looking ca. ENE across Green Valley and Calamity Creek basin toward Elephant Mountain. Photo: R. Mallouf.

to 610 m (2,001 ft) above the narrow alluvial valley of Calamity Creek on the west, and some 488 m (1,601 ft) above the floor of Chalk Valley to the east. The roughly rectangular-shaped mass of the mountain covers an area of some 42 sq. km (ca. 16 sq. mi), making it one of the larger free-standing landforms in the vicinity. The mountain is further distinguished by a nearly vertical cliff ranging from about 183 m (600 ft) to over 305 m (1,000 ft) that defines the summit, giving the appearance of a colossal walled rampart (Mallouf 2013:117). This wall is the eroded remnant of a massive syenite sill (Fig. 2) that formed when syenitic magmas intruded the volcanic succession. The result was local doming and faulting during late Tertiary times (Hardin 1942; Goldich and Elms 1949; McAnulty 1955; Collinsworth 1985).

Immediately across Calamity Creek valley to the west of Elephant Mountain lies Crossen Mesa. The eastern face of this plateau-like landform consists of a steep escarpment (ca. 183 m or 600 ft high) that is capped with a dark volcanic trachyte. This escarpment, which arcs to the north side (North Crossen Mesa) of Elephant Mountain and continues north with few breaks to the Mount Ord area, constitutes the southeastern boundary of the massive Davis Mountains volcanic field. The east side of Elephant Mountain is bounded by the broad alluvial valley of Chalk Draw, which terminates at the Cretaceous limestone escarpment of the Del Norte Mountains. To the south and southwest lies the vast extent of the low-lying Green Valley alluvial basin, a major physiographic zone that is broken

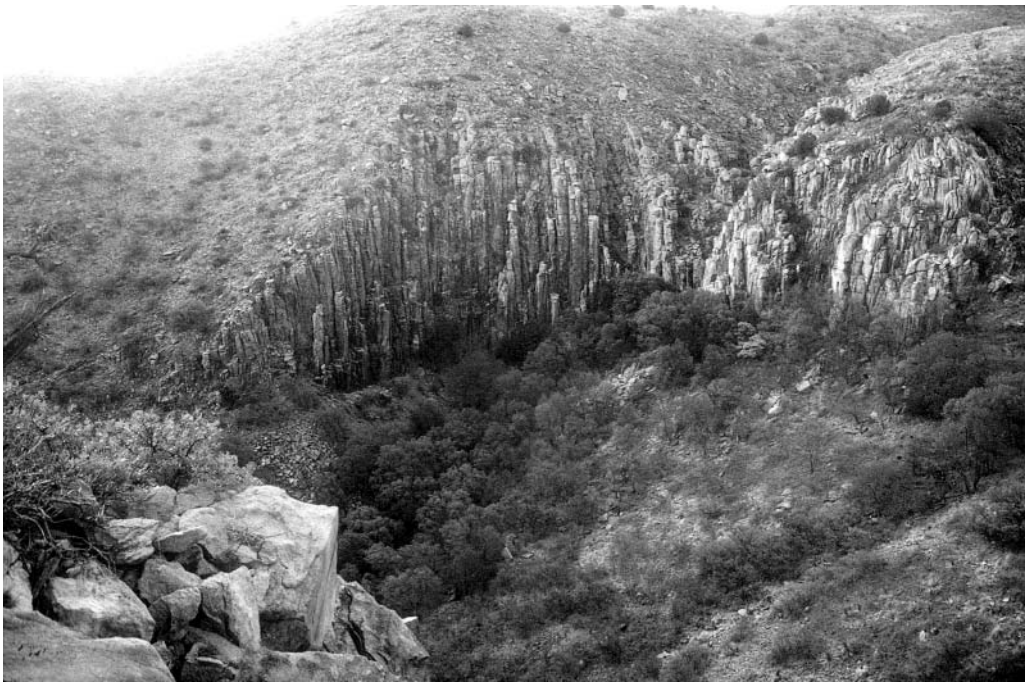


Figure 2. Rampart-like syenite bluffs characterize Elephant Mountain. Photo: C. Harrell.

by intermittent free-standing igneous prominences such as Black Hill, Buck Hill, Butcherknife Hill, and Straddlebug Mesa. Prominent on the horizon to the south-southeast is Santiago Peak, a distinctive flat-topped volcanic remnant that is steeped in local folklore. When viewed from the south and west, Elephant Mountain and Santiago Peak, the highest and most conspicuous landforms in the area, have the appearance of brooding sentinels above the desert flats (Mallouf 2013:117–118).

Calamity Creek has spring-fed headwaters in the vicinity of Ranger Peak, located a few kilometers southwest of Alpine, Texas. The stream meanders southward through high cliffs of the southern volcanic field of the Davis Mountains (Fig. 3), cutting to the east side of Cathedral and Cienega mountains before arriving in the vicinity of Elephant Mountain (Fig. 4). Perennial in its upper reaches, this important area stream bisects the Crossen Mesa massif and becomes intermittent at Elephant Mountain. As it exits the volcanic field, the creek trends due south along the west side of Elephant Mountain where it is entrenched deeply (2–8 m or 6.5–26 ft) in a relatively wide, flat alluvial valley. Sheep Creek, a short but also well-entrenched westward tributary, merges with Calamity Creek approximately midway down the valley. After cutting abruptly eastward across the south end of the mountain, Calamity Creek again turns south through the lower desert and eventually merges with Chalk Draw at a point due west of Santiago Peak (Mallouf 2013:118).

Chalk Draw, an intermittent stream that has a rather innocuous birth in the broad alluvial flat between the Del Norte Mountains and the eastern escarpment of Elephant Mountain, also trends southward and crosses along the west side of Black Mountain and Santiago Peak to its juncture with Calamity Creek. Unlike Calamity Creek, however, the Chalk Draw arroyo system east of Elephant Mountain is comparatively shallowly entrenched in an enormous, almost flat expanse of alluvium. Both Calamity Creek and Chalk Draw constitute important western tributaries of Maravillas Creek, one of the Big Bend's major tributaries to the Rio Grande.

Situated at the abrupt boundary of two strikingly different environmental zones—high juniper-pinon-oak woodlands and grasslands of the Davis Mountains volcanic field to the north, and low-lying desert scrub to the south—the Elephant Mountain area proved attractive for habitation by prehistoric populations. As indicated by past archaeological surveys and excavations, this was particularly true for the Calamity Creek drainage system which provided an abundance of water, with riparian vegetation close at hand along with both desert succulents and deciduous woodland plant species; a wide range of both large and small game; a plethora of favorable camping locales; and close-by sources of stone suitable for the production of tools.

Several area geological formations contain a variety of high-quality siliceous stone appropriate for tool-making. Importantly, these include limestone cherts, available in quantity from Lower Cretaceous formations (Fredericksburg Group) of the Del

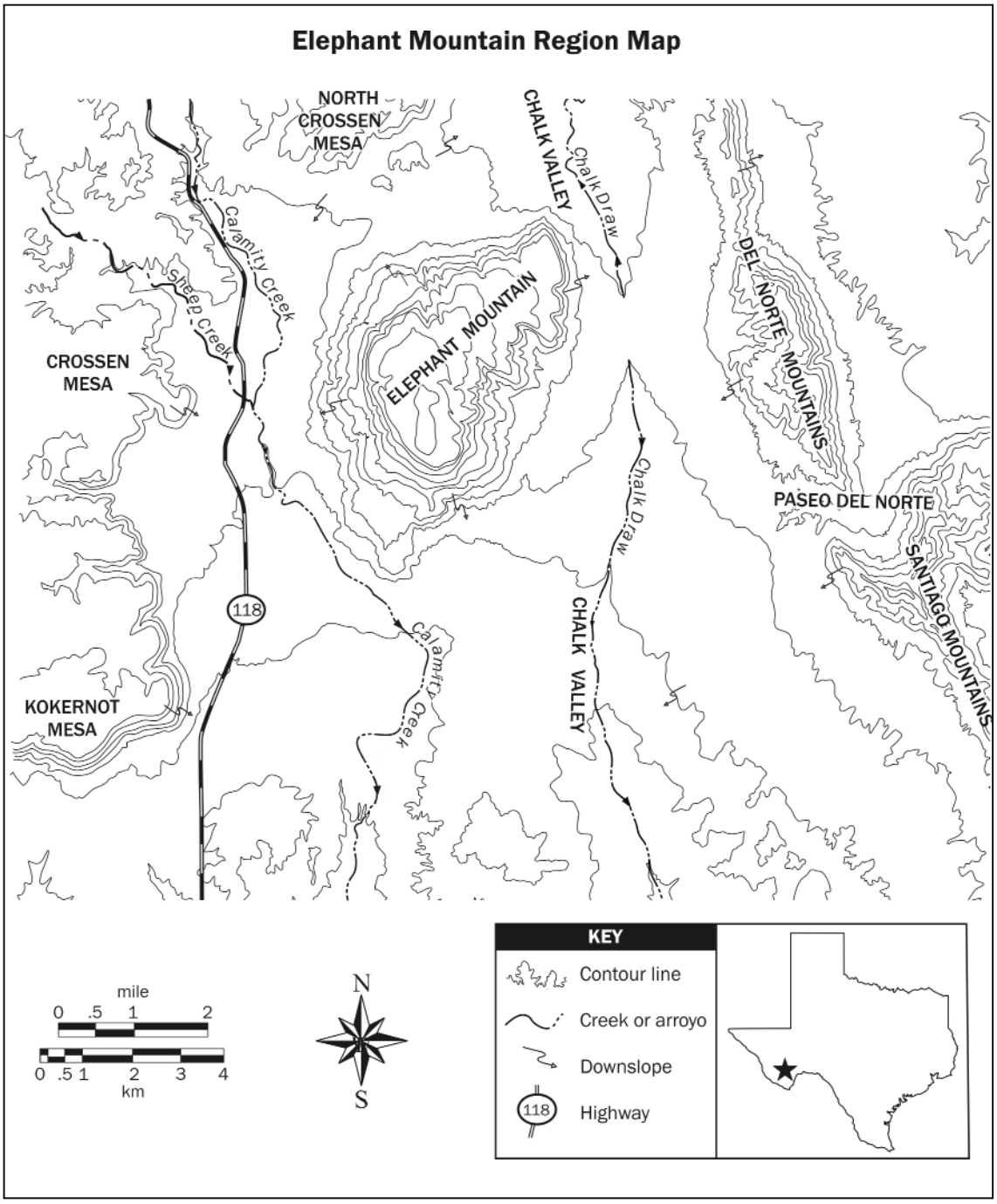


Figure 3. Map of Elephant Mountain and vicinity. Drafting by D. Hart.

Figure 4. A 1938 northwest view up Calamity Creek valley from the summit of Elephant Mountain. Cathedral Mountain is visible at upper far left. J. Charles Kelley in photo. Photographer unknown.

Norte Mountains a short distance to the east. Exposures to the southwest, west, and north of Elephant Mountain of Tertiary-age volcanic rocks, such as Pruett Tuff, Crossen Trachyte, Sheep Canyon Basalt, Potato Hill Andesite, and Cottonwood Spring Basalt, provide good sources of chalcedony, silicified wood, quartzite, chert, siliceous rhyolite and trachyte, and welded tuff (McAnulty 1955). The Crossen Trachyte, Sheep Canyon Basalt, and Cottonwood Spring Basalt members are also sources of high-grade banded and dendritic agates that are much prized by modern rock hounds. Many, if not all, of these stone types can also be found as gravels in point bar deposits on the floor of Calamity Creek (Fig. 5), where they could have been easily accessed by prehistoric knappers (Mallouf 2013:118–121).

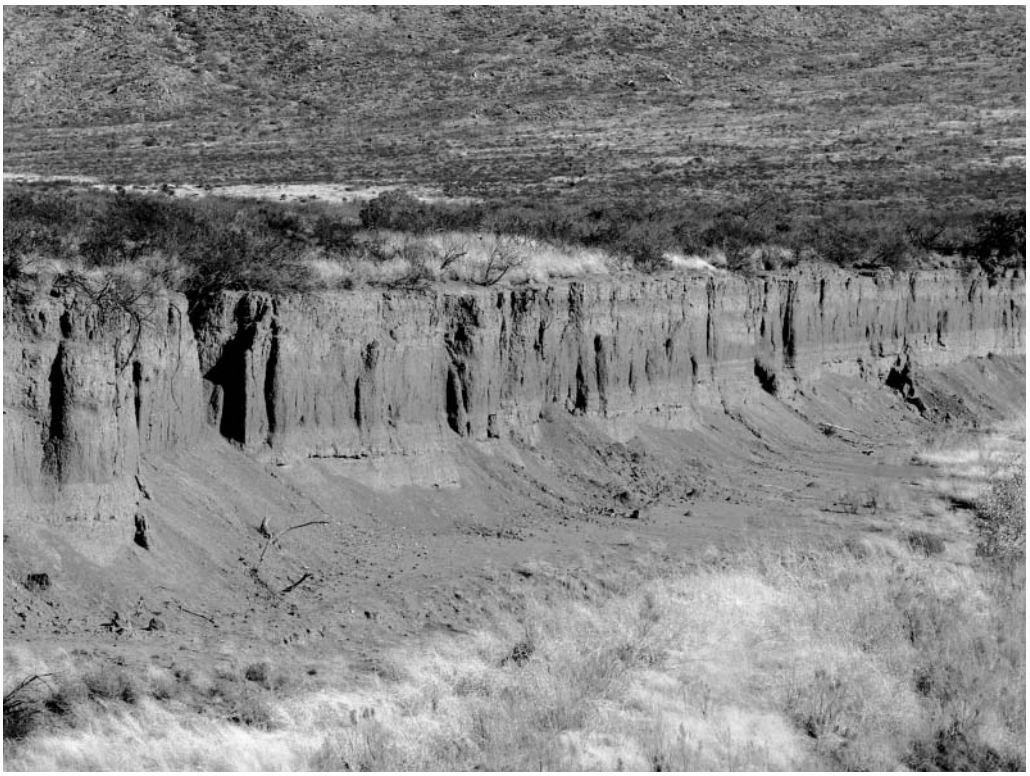


Figure 5. Looking east across a 7-m-high cutbank on Calamity Creek, with toeslope of Elephant Mountain in background. Photo: R. Mallouf.

Elephant Mountain Archaeology: 1920–2005

Scholarly curiosity in the prehistory and early history of the Texas Big Bend was foreshadowed by the discovery in 1895 of the Livermore Cache under a rock cairn on the summit of Mt. Livermore in the Davis Mountains. Consisting primarily of hundreds of stone arrow points, the find was widely publicized and stimulated interest on the part of scientists and laymen across the country. Among the interested parties was Charles Peabody of Harvard's Peabody Museum, who determined to see for himself the region of the discovery (Peabody 1909). It would be years later, however, before scientific attention was again drawn to the Big Bend.

Some of the first substantive research in the region was conducted during the 1920s by Victor J. Smith, an industrial arts professor at Sul Ross State Normal College (Tunnell 1992). Smith, who had some training in archaeology and who also served as curator of the university museum, began documenting and publishing on regional rock art as early as 1921–1923. Records at SRSU's Museum of the Big Bend indicate that Smith had documented a site in 1922 that he named Elephant Mountain Canyon Scratched Rock or Natural Bridge Cave (his Location No. 37). According to 1989 correspondence from the museum curator to the manager of the Elephant Mountain WMA, Smith's notes describe:

> a cave containing charcoal and bones. At the mouth of the cave is a boulder covered with markings. In our collection we have a small fragment from the boulder that exhibits many crisscrossing V-shaped grooves. We also have sketches of several pictographs, which are target-like in form . . . (Wulfkuhle n.d., letter to J. Kilpatrick, May 11, 1989).

While this particular archaeological site has been long sought by archaeologists and local folks, it has never been confidently relocated. However, Smith's 1922 description of this and other area sites inaugurated what would prove to be two decades of

focused archaeological research by himself and others in the Big Bend. But notably, it was Travis Roberts Sr., a local rancher, who first identified and brought the area's deeply buried archaeological sites to the attention of Smith and other archaeologists. By 1937, a significant measure of regional research had become centered on the Calamity Creek drainage at Elephant Mountain.

It was an assistant and protégé of Victor Smith—J. Charles Kelley—who first initiated a formal program of intensive archaeological research at Elephant Mountain. Much of what follows concerning Kelley's and others' work at Elephant Mountain is drawn from original correspondence in the J. Charles and Ellen Kelley archive currently housed at the CBBS, his various communications through the years with the junior author, and his published report of findings (Kelley, Campbell, and Lehmer 1940).

Kelley had served as Smith's field assistant during 1933 rockshelter excavations in Sunny Glen Canyon near Alpine, and he was a student of the renowned cultural anthropologist Clyde Kluckhohn while at the University of New Mexico. Kelley—like archaeologists and students of anthropology across the nation at the time—was excited about recent discoveries in New Mexico of artifacts associated with Pleistocene fauna (Folsom in 1926 and Clovis in 1932). He was hopeful that the Big Bend would yield comparable finds, and he had learned recently of a mammoth discovery in the vicinity of Elephant Mountain. While serving as assistant curator of the museum at Sul Ross State Teachers College in the late summer of 1937, Kelley and anthropology student George Williams set out to examine arroyo cuts south of Alpine in a search for deeply buried, and presumed very ancient, archaeological deposits. One of the stops made that day was at Sheep Creek, a short tributary of Calamity Creek on the Neville Ranch at Elephant Mountain. This area—now part of the Elephant Mountain WMA—was a few hundred meters upstream from the Sheep Creek-Calamity Creek confluence.

In a letter dated October 17, 1937, and addressed to his friend and mentor Clyde Kluckhohn, now at Harvard University, Kelley describes his significant find that day in a Sheep Creek cutbank:

> The summer rains were in progress and the newly cut exposures in the arroyas [*sic*] offered an excellent opportunity for observation. As we dropped down into the Sheep Creek Arroya [*sic*] I noted that heavy cutting had been accomplished by the recent headrises stripping off the upper alluvium over a large area . . . We walked over to the vertical bank . . . Immediately we found hearthstones in place, and continuing our searches discovered them to be eroding in large numbers from the [buried] surface of what I then took to be the clay beds . . . Mr. Williams called me over to point out a fragmentary projectile point still embedded in the silts. A few strokes of the trowel brought to light an articulated [human] knee joint and a mound of hearthstones over the

> bones (Kelley n.d., letter to Clyde Kluckhohn, October 17, 1937).

Human remains were discovered at a depth of 3–4 m (10–12 ft) below ground surface in the cutbank (Fig. 6). It was quickly determined that at least two human interments were present, one of which was positioned ca. one foot lower than the other in the stratigraphic sequence. The summer monsoon was threatening and, concerned that the arroyo might flood and destroy the features, Kelley elected to remove the burials immediately, pausing only to request on-site verification of the discovery by colleagues from Sul Ross State Teachers College. The close proximity of the two burials is reflected in the fact that only a small-sized excavation unit, measuring ca. 1 x 2 m (3.5 x 6.5 ft), was necessary to remove both features.

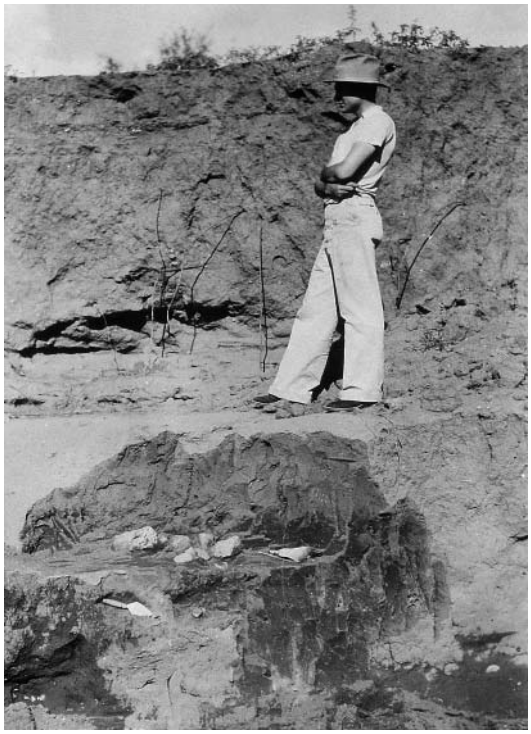


Figure 6. George Williams stands above upper Burial 1, topped with clustered stones, at the Sheep Creek site (41BS36), August 1937. Photo: J.C. Kelley.

The upper burial (Burial 1) consisted of a mounded layer of hearthstones under which "lay the bones tightly jammed together." The skeletal material was in such bad condition, it was decided to take most measurements with the material exposed *in-situ*. The skull, which was badly warped and pressure-flattened, faced west, but the body axis lay northeast-southwest (Fig. 7). No artifacts lay in direct association with the upper burial. In his letter cited above to Kluckhohn, Kelley notes, "My general impression of the entire [upper] burial is that it represented a secondary bundle burial, though this is open to question."

In describing the lower burial (Burial 2; Figs. 8–10), Kelley states that it was:

> an entirely different type of burial. It lay on its back, legs loosely flexed and lying on their right side, arms loosely folded across chest, head raised and facing towards the feet and the east, the body being oriented in a general east-west axis. Slabs, including three metates and several others had been set on edge in a rough oval over the burial, all slanting outward. In the enclosure thus formed, just below the top of the slabs, and over the body a large metate fragment lay horizontally . . . (Kelley n.d., letter to Clyde Kluckhohn, October 17, 1937).

Figure 7. Upper burial (Burial 1) in Calamity formation at the Sheep Creek site (41BS36); August 1937. Photo: J.C. Kelley.

While Kelley could not have predicted it at the time, the patterned use of stone slabs in construction of the Burial 2 feature would ultimately prove to be unusual, or possibly even unique, among prehistoric mortuary practices in the Big Bend proper. By contrast, "slab burials" had been demonstrated by the 1930s to be relatively common in west-central and north-central Texas (e.g., Ray 1938).

Kelley believed that only the outer periphery of the Sheep Creek site deposit was exposed in the cutbank, and that most of the remaining cultural deposit lay deeply buried and intact. He was unable to confidently assign a relative age for the burials and accompanying site components; however, based on

Figure 8. Lower slab burial (Burial 2) deep in Calamity formation at the Sheep Creek site (41BS36); August 1937. Photo: J.C. Kelley.

Figure 9. Detail of Burial 2 with cranium at far left and in-situ *slab metates at Sheep Creek site (41BS36); August 1937. The capping slab metate is pedestaled at upper center. Photo: J.C. Kelley.*

his recovery of several dart points, the complete lack of pottery, and other evidence, he felt strongly that it was "our earliest known sub-stratum in this vicinity and is certainly representative of a fairly early American stratum in general . . . ." As a portent of what was to come, a "headspring rise" flooded the arroyo floor immediately after completion of the emergency excavation (Fig. 11).

Armed with the Sheep Creek data and that of three other regional deeply buried sites, upon his return to Alpine Kelley set about compiling an annotated pictorial overview of his findings for H.W. Morelock, then president of Sul Ross State Teachers College. Titled "Ancient Man in the Texas Big Bend Region" and dated September 12, 1937, this unpublished in-house document represented Kelley's initial attempt to obtain his university's administrative support for—what was at the time—a cutting-edge interdisciplinary research project. Excited by the research potentials of his initial Sheep Creek findings, in late October 1937 Kelley submitted the skeletal material to E.A. Hooten, a prominent physical anthropologist at Harvard University, for detailed analysis (The Skyline 1937). However, the actual analysis and reporting was conducted by a colleague of Hooten, George Woodbury (1937).

Thus, through a series of communications with Hooten and with his Harvard mentor Clyde Kluckhohn, Kelley piqued the interest of Donald Scott, director of the Peabody Museum, and Kirk Bryan of Harvard's division of geology. In a letter to

Figure 10. Detail of in-situ *lower burial (Burial 2) after removal of stone slabs at Sheep Creek site (41BS36); August 1937. Photo: J.C. Kelley.*

Kelley dated December 3, 1937, Kluckhohn encouragingly stated:

> All of us here have become, as we thought the matter over, increasingly interested in what you have been turning up, and we wonder if you and your institution might welcome outside cooperation. I am writing you at the moment unofficially but with the knowledge and permission of the Director of the [Peabody] Museum, and if your reply to this letter is favorable you can be assured that an official proposal will be made (Kelley n.d.).

In this and other ways, Kelley advocated the potentials of the Sheep Creek site and Big Bend region to contribute to the rapidly expanding field of Early Man studies in the southwestern United States. The Sheep Creek site would ultimately prove to be a catalyst for the development in late 1937 of a cooperative interdisciplinary research program between the Peabody Museum of Harvard University and Sul Ross State Teachers College.

The Peabody Museum-Sul Ross College Expedition, as it came to be known (The Skyline 1938a), was designed by Kelley with minor input from Clyde Kluckhohn, Donald Scott, and Kirk Bryan. As conceived by

Figure 11. Immediately after removal of the burials at the Sheep Creek site (41BS36), a "headspring rise" removed most traces of the excavation. Lower stake marks the location of Burial 2; August 1937. Photo: J.C. Kelley.

Kelley, the project focus was "to investigate the occurrence of human skeletal remains and archaeological materials in association with geological deposits" across the Big Bend region (Kelley, Campbell, and Lehmer 1940:11). It was a pioneering, interdisciplinary effort in what today would be termed geoarchaeological research. The geological aspect of the program fell to Kirk Bryan, who, in company with Claude C. Albritton of Southern Methodist University, carried out field and laboratory research through a grant from the Geological Society of America.

The archaeological effort of the eight-month project was funded to the tune of $2,000—Peabody Museum ($1,500) and Sul Ross State Teachers College ($500). In addition, the respective institutions would provide project personnel: J.C. Kelley from Sul Ross; T.N. Campbell and Donald J. Lehmer from Harvard's division of anthropology (The Skyline 1938b and 1938c). Field crews for excavations would be obtained from the federal Works Progress administration (WPA). The field plan would include "thorough" excavation of two or three sites to be selected and directed by Kelley (Kelley n.d., letter, Donald Scott to H.W. Morelock, December 18, 1937).

The Expedition was launched on January 1, 1938. Four WPA laborers had been assigned to the project by January 10, 1938.

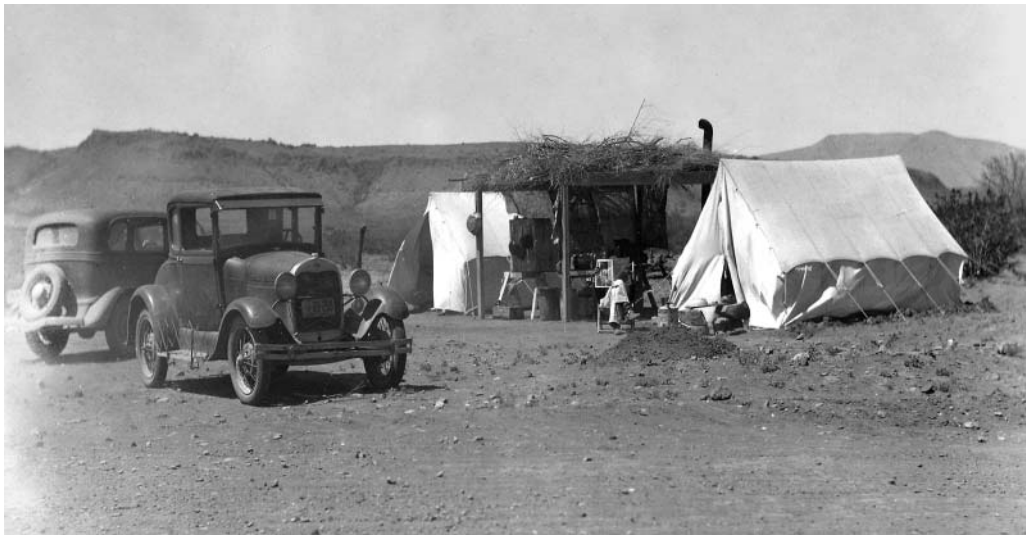


Figure 12. Kelley's Peabody Museum-Sul Ross Expedition camp, Sheep-Calamity Creek area; April 1938. Photographer unknown.

Survey work was initially focused by Kelley on sites in or near Sunny Glen Canyon in the Alpine area (where Victor Smith was typically active), upper Alamito Creek in the Marfa Plain, and segments of Dugout Creek south of the Glass Mountains. But in an exchange of February correspondence between Kelley, Scott, Bryan, and Kluckhohn, the latter all urged Kelley to instead make the "Elephant Mountain site"[1] (Sheep Creek site) his focus of excavation, and to start work there as soon as possible. Kelley acquiesced, and in a letter dated March 18, 1938, to Donald Scott, Kelley reported that "camp was established at the Elephant Mtn. site [Sheep Creek site] and excavations started by March 1st" (Fig. 12).

Shortly thereafter, the project geologists Albritton and Bryan chose the Sheep Creek site as their type locality for the long-lived Calamity Holocene formation (Albritton and Bryan 1939). Thus, the site figured importantly in their overall delineation and characterization of three major depositional formations across the region—the Neville (terminal Pleistocene), the Calamity (Holocene), and the Kokernot (Recent). Albritton and Bryan's work on Sheep and Calamity creeks, and on several other area localities, would become a standard reference for Quaternary period researchers for generations to come.

Having to split his time between the expedition and university commitments in Alpine, Kelley placed T.N. Campbell in

1. Kelley's original name for the Sheep Creek site, and the name used in all his 1937–1938 project correspondence, was the "Elephant Mountain site." Without explanation, the name was changed to Sheep Creek site (Alpine 9:1a; 41BS36) for purposes of the 1940 publications of findings.

charge of the new Sheep Creek site excavation. Over 15 days into the excavation Kelley had to report to the Peabody's director, Donald Scott, that:

> The excavations, up to the present writing, have produced no artifacts. Flint chips, hearthstone, and charcoal have appeared but in small quanties [*sic*] . . . The lack of artifacts up to this time has been very hard on staff morale, and is in general very discouraging (Kelley n.d., letter to Donald Scott, March 18, 1938).

As of March 21, only one fragmentary projectile point had been forthcoming from the excavation. In a discussion of this second season of work performed at Sheep Creek, Campbell states that the expedition picked up where the 1937 work left off and carried the original excavation 5 m (16 ft) back into the arroyo bank, and along the bank 9 m (28 ft) to the north and 4 m (12 ft) to the south—a sizable area. In a typically modest and understated fashion, Campbell (1940a:96) notes that:

> The excavation of such a site as this is rather tedious work and requires considerable patience. Here the cultural remains were widely scattered both horizontally and vertically, and this called for constant vigilance in order to avoid overlooking anything. Nearly all of the earth moved during excavation was sifted through screens.

In a published summary of both seasons' findings at Sheep Creek, Campbell relates that the upper burial (Burial 1) found by Kelley in 1937 was likely that of a middle-aged female with Pecos River focus (Middle Archaic) affiliation, while the lower burial (Burial 2) was of a middle-aged male of unknown, but possibly earlier cultural affiliation. In contrast to Kelley's 1937 inference that the upper feature was a probable secondary bundle burial, Campbell states that instead, both burials, while in extremely poor condition, were articulated and flexed (Campbell 1940:106–107).

The excavation at the Sheep Creek locale was continued until April 19, 1938, at which time the site was closed due to diminishing

Figure 13. T.N. Campbell examines buried cultural deposit in cutbank at the Calamity Creek site (Alpine 9:1b); April 1938. Photographer unknown.

returns. The expedition was then shifted downstream a short distance to a second deeply buried site (Fig. 14) near the interfluve of the Sheep Creek-Calamity Creek confluence—also on what would eventually become Elephant Mountain WMA property. Termed the Calamity Creek site (Alpine 9:1b) by Kelley, this new site had been discovered during the work on Sheep Creek. Located on the west side of Calamity Creek a short distance above the confluence, attention was first drawn to an exposed hearth at 2 m (7.5 ft) below ground surface in the arroyo wall.

To arrive at a clearer understanding of the stratigraphy, a 1 x 1 sq m (8 x 8 sq ft) test unit was excavated into the arroyo floor at the base of the cutbank (Fig. 14).

Hearthstones and artifacts were encountered at depths ranging from 1 to 2 m (4.5 to 7 ft) below the bed of the arroyo, or up to 5 m (15 ft) below ground surface. Campbell, rarely prone to hyperbole, describes the archaeologists' initial reaction:

> This had not been anticipated and at first the situation did not appear very clear. A correlation of the humic zones at this site

Figure 14. Excavating an 8 x 8 ft test unit into the arroyo floor at the Calamity Creek site (Alpine 9:1b); May 1938. Photo: J.C. Kelley.

> with those of Sheep Creek indicated that this deepest cultural refuse was referable to a much earlier occupation than anything found up to that time (1940:108).

Upon widening and deepening the original test unit, it became evident that:

> the lowest material—hearthstones, charcoal, artifacts, flakes, etc.—lay along the contact between the Neville [Pleistocene] and Calamity [Holocene] formations. Thus, at the Calamity Creek site two distinct cultural horizons were present, one in the lower part of the lower humic zone in the Calamity formation, the other at the very base of the Calamity. The two [cultural] horizons were separated by a zone which showed only slight evidence of human occupation (Campbell 1940b:108).

It was decided to greatly expand the excavation for the purpose of obtaining a representative series of artifacts from each of the two superimposed cultural strata, with an emphasis on the lowest stratum. A long trench was excavated down to the Neville-Calamity formation contact (Fig. 15), and the original test pit was carried down ca. another meter (4 ft) into the Neville formation to determine if even older Pleistocene-age cultural components might be present—the latter with negative results. The lower cultural zone, however, was determined to be quite extensive, but as was the case with deep cultural deposits at the nearby Sheep Creek site, the artifact assemblage was "not imposing." In reviewing

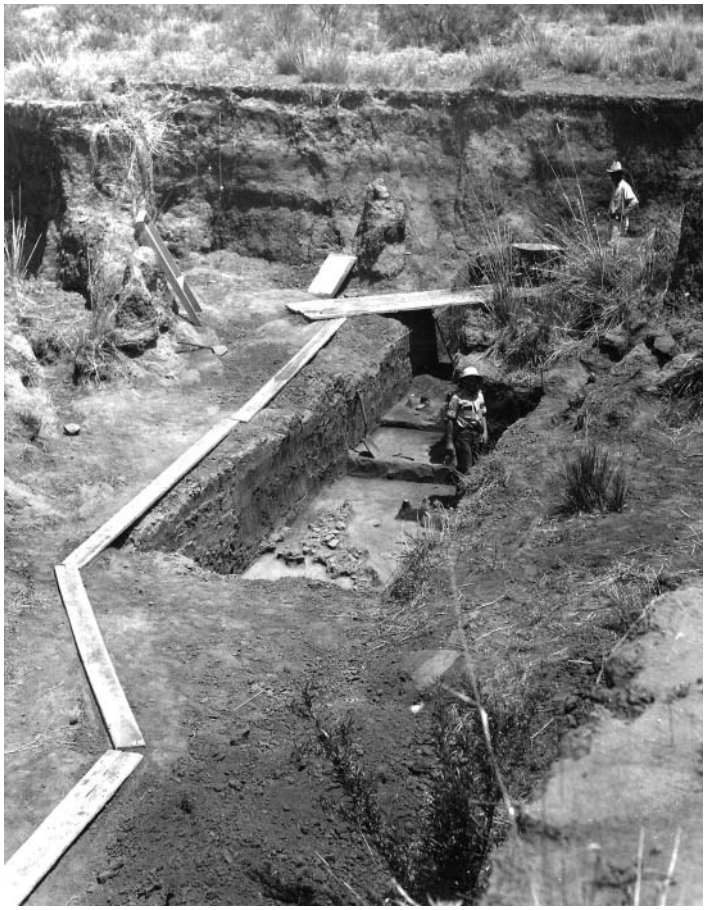


Figure 15. The lower cultural zone ("Maravillas complex") exposed deep below the arroyo floor at the Calamity Creek site (Alpine 9:1b); June 1938. Photographer unknown.

their findings from the Calamity Creek deposit, Kelley and Campbell elected to assign tentative cultural constructs to the upper and lower cultural horizons in the expectation that continued work in the region would "fill in the outlines of the culture[s] which here appear so shaky." The term "Santiago complex" was applied to the upper cultural deposit, while the lower deposit was designated the "Maravillas complex" (Campbell 1940:110). A lack of ceramics and paucity of projectile points in both upper (n=4) and lower (n=2) occupation zones hindered temporal and cultural assignment of the components, leaving most questions of the investigators unanswered. Considering the positions of the components in the lower Holocene (Calamity formation) stratigraphic column at the site, along with the presence of dart rather than arrow points, it can be assumed today that both deposits were of Archaic period affiliation.

The two-month excavation at the Calamity Creek site was brought to a sudden end by two separate downpours during the Big Bend summer monsoon season (Fig. 16). In a letter dated August 20, 1938, to E.A. Hooton of the Peabody Museum, Kelley states that:

> Excavation in the deeper levels was brought to an abrupt close by the unexpectedly early arrival of heavy summer rains. Twice the entire excavation filled up entirely with silt; we re-excavated it the first time but gave up the last (Kelley n.d.).

Kelley and Campbell wrapped up their expedition work on what is now the Elephant Mountain WMA with the preliminary documentation of 11 additional sites within a 2-mile radius of the Sheep Creek/Calamity Creek excavations. Minor subsurface testing was conducted at 2 of the 11 sites (Alpine 9:10 and Alpine 9:13). Site Alpine 9:13, located on the east bank of Calamity Creek just above its confluence with Sheep Creek, was determined to be a Late Prehistoric component within the Kokernot formation. It was the only expedition site on the WMA to yield pottery sherds—all undecorated brownwares. Most of the remaining surface-exposed sites produced lithic artifacts of both Late Archaic and Late Prehistoric affiliation. Most fieldwork of the Peabody Museum-Sul Ross State Teachers College Expedition was terminated by the end of August 1938 due to depletion of funding. Kelley, Campbell, and Lehmer, all three of whom were in a state of flux relative to their educational goals and professional careers, then turned their attention to generating a report of findings without adequate funding for completion. A report (Kelley, Campbell, and Lehmer 1940) detailing the expedition's work with deeply buried cultural deposits, on what would eventually become the Elephant Mountain WMA, was issued by Sul Ross State Teachers College two years later.

The work of Kelley, Campbell, and Lehmer in the late 1930s constitutes the only large-scale scientific excavations yet conducted in the immediate vicinity of Elephant Mountain. However, a number of

small-scale surveys and exploratory excavations have been conducted through the years—primarily since the late 1980s—that enhance the archaeological database for this specific area. The 1985 donation of Elephant Mountain Ranch to the TPWD has since resulted in state-required archaeological surveys ahead of any development or land-altering projects.

Figure 16. Looking upstream at the inundated Calamity Creek site (Alpine 9:1b) during the second flood in June 1938 that terminated Peabody Museum–Sul Ross expedition field research at Elephant Mountain. Photographer unknown.

A series of brief in-house archaeological reconnaissances conducted in 1988 and 1989 by Mike Davis of TPWD staff pointed to the fact that archaeological sites were abundant and occurred among a wide range of landforms in the Calamity Creek valley (Davis n.d.). In addition to recording open and buried prehistoric sites along Calamity Creek, Davis formally recorded an historic house site and structure ("Chalk Valley house"; Site 41BS815) related to the historic Neville Ranch at the north end of the mountain. This significant ca. 1880 historic site was subsequently researched and documented architecturally by Sheron Smith-Savage of TPWD staff, who noted that the house site had excellent potential for historic

archaeological deposits (Smith-Savage 1989; Ing 1997).

Accompanied by Virginia A. Wulfkuhle, archaeologist and then curator of the Museum of the Big Bend at SRSU, Mike Davis returned to the WMA in May of 1989. The field team formally recorded Site 41BS814, still another deeply buried cultural deposit in the cutbank of Calamity Creek that would be subjected to detailed documentation by the SRSU archaeological field school in 1996. On the summit of Elephant Mountain, Davis and Wulfkuhle also recorded Site 41BS816, an open site (Fig. 17) that contained four small enclosures of stacked stones—thought at the time to be prehistoric hunting blinds (Davis n.d.; Wulfkuhle n.d.; Ing 1997).

A Calamity Creek realignment project proposed in early 1996 to deter cutbank erosion in the WMA resulted in an archaeological survey of areas east and northeast of the WMA headquarters. One of the two sites recorded during the survey is an extensive (300-m-long [984-ft]) prehistoric open campsite fronting on the creek and containing some 25 thermal features on the ground surface. Termed the Calamity Meander site (41BS1103), recovered diagnostic artifacts indicate occupations at intervals from the Early Archaic through Late Prehistoric periods (Cloud n.d.; Houk and Barile 2000).

The 1996 WMA decision, discussed earlier, to create a wilderness trailer park/campground on Calamity Creek resulted

Figure 17. Archaeologist Mike Davis inside one of four stacked-stone enclosures (Site 41BS816) on the summit of Elephant Mountain; April 1989. Photo: V. Wulfkuhle.

in a fairly intensive investigation of the Hackberry Motte site (41BS1104) that included scale mapping, test excavations, and profiling of pertinent cutbanks (Cloud 1996). The site was determined to have multiple Archaic components that were severely impacted by historic land-clearing and plowing. As noted earlier, the fieldwork here was carried out as part of the 1996 SRSU summer archaeological field school reported herein.

Among the eight new archaeological sites discovered and documented during the 1996 field school was a large open prehistoric campsite along the east side of Calamity Creek. Named the J.B. McHam site (41BS1484) in honor of one of the field school participants that was killed in a car roll-over shortly after the field school, this extensive site yielded a great deal of information concerning cultural features and surface artifactual remains, but is most notable for the discovery of a prehistoric lithic cache of what are surmised to be Late Archaic dart point preforms (Mallouf 2013:115–152).

A few months after completion of the field school, in November 1996, geoarchaeologist Rolfe Mandel (University of Kansas) along with the junior author of this volume took a series of bulk sediment samples from deeply buried cutbank paleosols on Sheep Creek upstream from the Sheep Creek Site (Fig. 18).

The soil of interest had blocky peds, a dark reddish-brown hue, and carbonate stringers. A bulk carbon assay of 6400 +/- 110 B.P. (ca. 4400 B.C.) was obtained for the stratum—a significant finding with regard to J. Charles Kelley's data from Burial 2 at the close-by Sheep Creek site (41BS36) in that it added additional support for an inferred Early-to-Middle Archaic age for that cultural feature.

In February 1997, an in-house TPWD archaeological survey was conducted by J. David Ing along a proposed 5.3-km-long (3.3-mi-long) fence line in the Chalk Draw drainage system paralleling the east side of Elephant Mountain. An extensive open prehistoric campsite with hearths and metates exposed on the ground surface was discovered and subsequently mapped (Ing 1997). Shovel testing of the site by TPWD

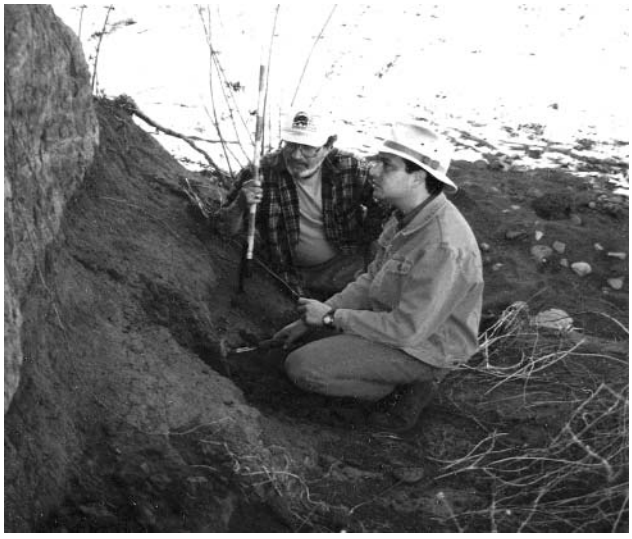


Figure 18. Robert Mallouf and Rolfe Mandel taking bulk sediment samples for radiocarbon assay on Sheep Creek; November 1996. Photo: Frank Garcia.

archaeologists in May 1997 revealed that the site contained a buried cultural component within an alluvial fan deposit. Diagnostic artifacts recovered from the surface of the site indicate repeated occupations from Early Archaic through Late Prehistoric periods (Howard 1997; Ing 1997).

In 2002, a proposed fiber-optic route primarily along the west side of Calamity Creek was subjected to archaeological survey by the CBBS and resulted in the formal recording of five new sites. One of these (41BS1490) yielded a wide range of diagnostic artifacts indicating occupations from the Early Archaic through Late Prehistoric periods. All five of the newly recorded sites had intact or partially intact thermal features and all had potential for associated subsurface cultural deposits. Of special note was the discovery of a probable bison skull, apparently without any cultural associations, in a track hoe trench some 4–5 m (13–16 ft) below ground surface (Cloud 2002).

Field and Laboratory Procedures

The 1996 field school personnel consisted of the instructor, a field assistant, a laboratory assistant, a volunteer photographer, a cook, and 10 students, comprising a total of 15 participants. Housing for the group was provided by the WMA and included full-time use of the refuge's bunkhouse and a temporary space in the WMA lodge. Since the living space provided was necessarily small for such a large group, tents were preferred by several students. Because of potential issues with wildlife (e.g., desert bighorn sheep), however, the use of tents was restricted to areas immediately adjacent to the bunkhouse. Space for a working laboratory was not available, so temporary lab work areas were established outside the building. adding to logistical problems was the fact that water was not available at the bunkhouse and had to be hauled in—a task for which several field school participants and various WMA personnel were of great assistance.

Notes and manuscripts of archaeologists and other researchers who had worked previously in the Elephant Mountain area were compiled and made available to participants at the field headquarters. These included the early pioneering work of archaeologists J. Charles Kelley and T.N. Campbell, as well as more recent work by archaeologists J. David Ing, Sheron Smith-Savage, Michael Davis, and Virginia A. Wulfkuhle. Background materials by geologists Claude C. Albritton, Kirk Bryan, and G.C. Hardin were also made available.

Fieldwork was conducted on a roughly 7:00 a.m. to 3:00 or 4:00 p.m. schedule, depending on the heat levels that could be tolerated by participants during this hottest time of year (June). The heat adversely affected one student to the degree that he pulled out after the first week. Our schedule was also punctuated by intermittent afternoon thunderstorms, which at times closed down all field activities.

As noted earlier, the initial fieldwork was conducted at an area along Calamity Creek in the northwest section of the WMA that had been selected tentatively for use as a primitive campsite for the public. Termed the Hackberry Motte site (41BS1104),

its location on a terrace fronting on the creek proved useful for introducing the students to many of the investigative procedures they would practice repeatedly during the overall field school. These included intensive survey, compass and tape mapping, unit excavation, shovel testing, stratigraphic profiling, and maintenance of horizontal and vertical control with a surveying instrument (theodolite). Each student was expected to compile a personal field log throughout the summer session.

Site reconnaissance and intensive survey was focused on areas of the WMA east of Highway 118 and extending east to Calamity Creek—in other words, the west side of the creek, from a roadside park on the north to a WMA boundary fence line on the south. While the east side of Calamity Creek was largely restricted from access, a few small areas that were surveyed yielded several significant sites. A very brief reconnaissance was also carried out at the far southeastern corner of the WMA in the foothills of the Del Norte Mountains. In this case, an effort was made to determine if toolstone sources for gray chert in Elephant Mountain sites were present in the limestone strata. The results were inconclusive.

Most sites previously recorded in the project zone were, if still extant, revisited and re-evaluated. One such site (41BS814) having multiple buried cultural lenses in a 6-m-high (20-ft-high) bluff face on Calamity Creek served as a training ground for instruction on preparing complex vertical profiles. Work here included documentation of eroding thermal features and the taking of radiocarbon and matrix samples for special study. A deeply buried terrace site that was the focus of large-scale excavations by J. Charles Kelley et. al. in 1938 (Calamity Creek Site 9:1b) could not be relocated, nor could the Sheep Creek Site 9:1a, another deeply buried site with burials that was investigated by Kelley in 1937–1938.

Previously undocumented sites discovered during the course of the field school were recorded on State of Texas Archaeological Survey forms. Documentation included the preparation of instrument and/or compass and tape maps, controlled surface-collection of temporally or functionally diagnostic artifacts, and photo documentation of cultural features and vertical soil exposures (Figs. 19, 20, and 21). Artifact recovery was generally kept to a minimum. It is believed that most, if not all, of the sites examined by the field school had been subjected to surface relic hunting in the past. However, no evidence of active or recent digging of archaeological sites was encountered.

Large-scale excavation was not attempted during the field school. Test excavations—typically consisting of single 1 x 1 m (3 x 3 ft) units—were used sparingly to explore and save data from cultural features that were in imminent jeopardy from erosion or projected road maintenance across the WMA. Several of the sites were subjected to controlled surface-collection using a theodolite and stadia rod. Each student received individual training in the use of a theodolite for manual contour mapping of sites. A great deal of individual training in the completion of State of Texas Site Data forms was also provided to students.

As noted earlier, test excavations were typically oriented toward saving information from endangered cultural features such as hearths, incipient baking ovens, and, in one notable case, a stone cache. These features were found eroding out of the arroyo cutbanks or were exposed by sheet erosion on the terrace surfaces along Calamity Creek and its tributaries. In practice, a 1 x 1 m (3 x 3 ft) or similar unit was placed to encapsulate a feature and then excavated using 5 or 10 cm (2 or 4 in) levels

Figure 19. Robert Mallouf, field school director, providing instruction to student participants; May 1996. Photo: C. Harrell.

Figure 20. William A. Cloud (left), field school assistant, provides instruction in field mapping techniques; June 1996. Photo: C. Harrell.

Figure 21. Field school participants receiving instruction in paleosols and site identification at Site 41BS1103; May 1996. Photo: C. Harrell.

outside the feature—with the feature itself being excavated as a single entity. All excavated material was processed with one-eighth or one-quarter inch wire mesh screens, and all recovered cultural material was bagged and labeled appropriately. Matrix and radiocarbon samples were routinely taken from the interior of exposed thermal and other features.

All cultural materials were transferred to the field headquarters for processing. However, a lack of sufficient space curtailed some activities typically performed in a field laboratory setting. As a result, most recovered cultural material was inventoried in the field and then transferred to the CBBS in Alpine for specimen cataloging and processing.

Instruction continued routinely into evenings at the field headquarters, and special programs on the archaeology of the area and region were presented by invited speakers. Field trips to archaeological sites in Big Bend National Park and La Junta de los Ríos were also provided by field school staff.

Sites Investigated During 1996 Field School

At the time of the 1996 SRSU archaeological field school, there were 14 previously recorded sites near the flanks and on the summit of Elephant Mountain. The field school relocated and examined six of these sites (41BS37, 41BS764, 41BS810, 41BS811, 41BS814, and 41BS1104), attempted to relocate two other previously recorded sites (41BS35 and 41BS36), and recorded six new sites (41BS1480, 41BS1481, 41BS1482, 41BS1483, 41BS1484, and 41BS1485) on the west and southwest side of the mountain (Fig. 22). Six of the relocated and new sites were targeted for minor subsurface testing (41BS814, 41BS1104, 41BS1481, 41BS1482, 41BS1484, and 41BS1485).

Sheep Creek Site (41BS36; Alpine 9:1a)

As pointed out in an earlier discussion, the Sheep Creek site played a pivotal role in bringing substantive scientific attention to archaeological resources of the Big Bend region. Located in the northern cutbank of the Sheep Creek arroyo a short distance above its confluence with Calamity Creek on the Elephant Mountain WMA, this open, but deeply buried, prehistoric campsite with eroding Archaic-age human burials was the catalyst for the Peabody Museum-Sul Ross State Teachers College Joint Expedition of 1938. The fact that the joint expedition's original field number for the site (Alpine 9:1a) was appended with an official state trinomial number (41BS36) at a much later date suggests that portions of the site remained intact subsequent to the 1937 and 1938 excavations. However, 1996 field school efforts to relocate the site by examining Sheep Creek cutbanks for cultural material (Fig. 23) proved largely unsuccessful. It is possible, but not yet demonstrated, that the 48-year interval saw complete destruction of the site by lateral cutting and slumping during monsoonal flooding. At any rate, future efforts to confidently relocate the Sheep Creek site would likely require the use of backhoe trenching.

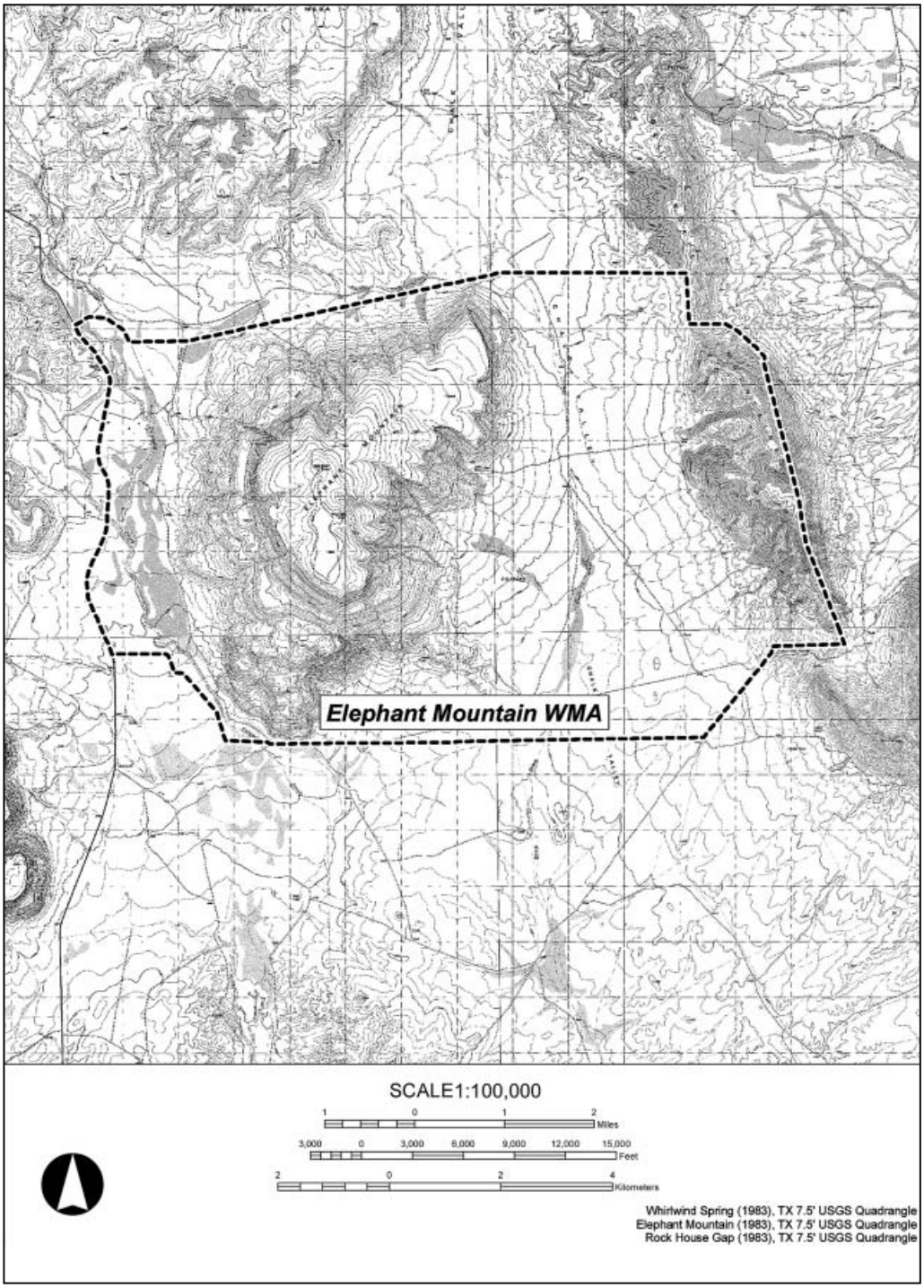


Figure 22. Elephant Mountain Wildlife Management Area, Brewster County, Texas.

Figure 23. The 1996 field school participants search a cutbank for evidence of the Sheep Creek site (41BS36; Alpine 9:1a). Photo: C. Harrell.

Calamity Creek Site (Alpine 9:1b)

Located near the interfluve of Sheep Creek and Calamity Creek, this previously discussed deeply buried series of cultural components was Kelley, Campbell, and Lehmer's (1940) type site for two preliminary Archaic-age cultural constructs—the Santiago and Maravillas complexes, respectively. As noted earlier, the 1938 excavations here were extended deep into the arroyo floor where a cultural component was encountered some 17 feet below the terrace surface, at the contact of the Neville (Pleistocene) and Calamity (Holocene) formations. Two months of excavation here came to an abrupt halt when monsoonal summer rains led twice to overbank flash flooding of Calamity Creek. The flooded excavation units were considered beyond repair after the second episode, and more rain was on the horizon.

A brief search conducted during the 1996 field school for this highly significant site proved largely unsuccessful due to the densely vegetated condition of the interfluve and severe erosion and sloughing of the arroyo walls. As in the case of the nearby Sheep Creek site, a concentrated effort to relocate cultural components here would likely require use of heavy equipment.

Site 41BS37 (Alpine 9:13)

Site 41BS37 (Alpine 9:13) was originally recorded by the 1938 Peabody Museum-SRSU joint expedition. The site was relocated and formally recorded by the SRSU archaeological field school on June 7, 1996 (Fig. 24). This unnamed site is an open,

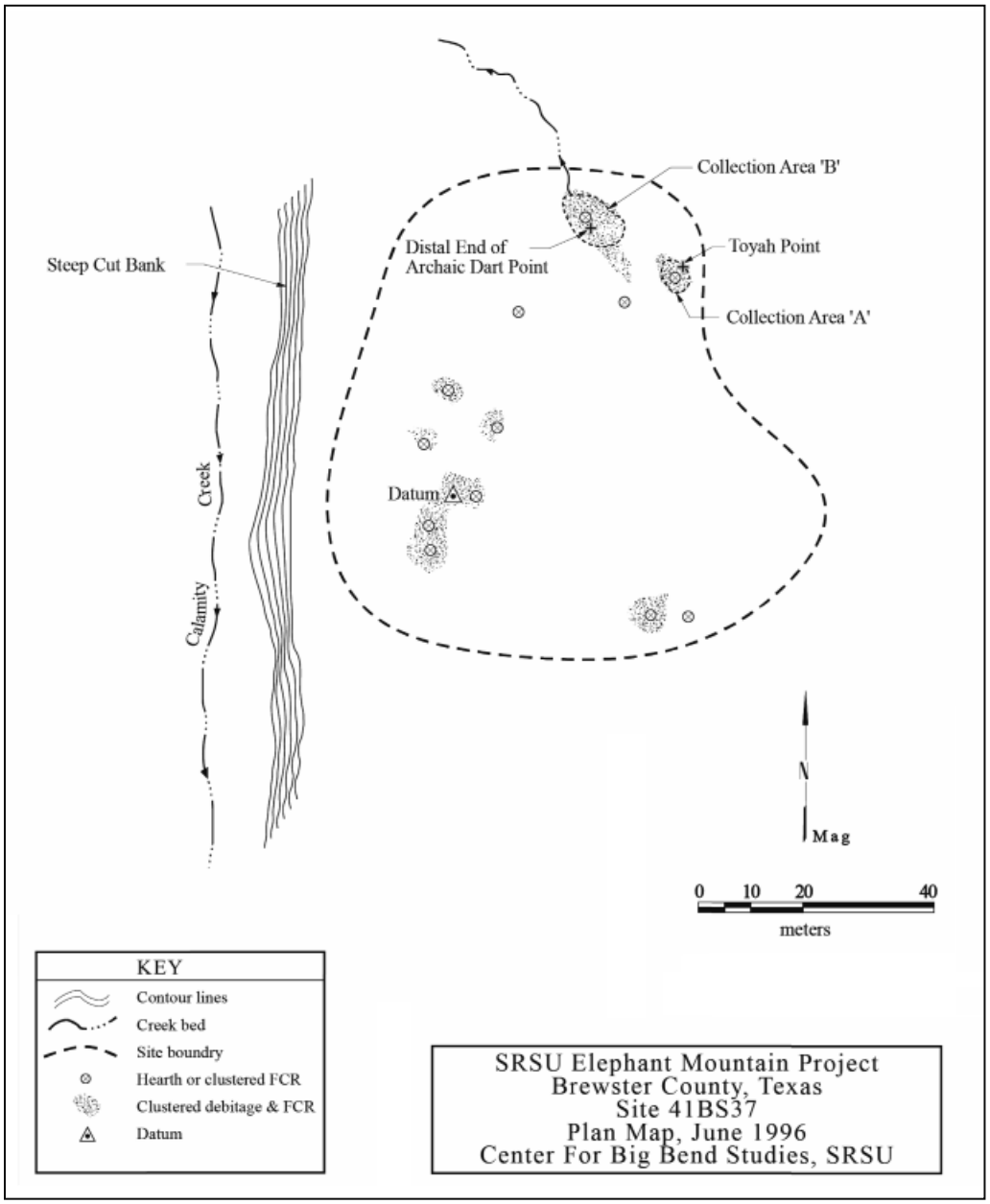


Figure 24. Plan map of Site 41BS37 (Alpine 9:13). Drafting: D. Hart.

multicomponent prehistoric site located on a gradually sloping silty terrace on the east side of Calamity Creek roughly 120 m (394 ft) north of its confluence with Sheep Creek. The site measures ca. 80 m (262 ft) (N-S) by 90 m (295 ft) (E-W) and has a view of Crossen Mesa, Cathedral Mountain, Elephant Mountain, and Cienega Mountain. It is located within a floodplain supporting notable growths of honey mesquite (*Prosopis glandulosa*) and creosotebush (*Larrea tridentata*)—the latter dominating the vegetation.

During the 1938 joint expedition, Site 41BS37—referred to by Kelley as Alpine 9:13—was test excavated to clarify and refine the natural stratigraphic sequence established by Albritton and Bryan (1939). The excavation clearly showed that the surface cultural deposit was *in-situ* in the Kokernot formation. Kelley and his field personnel surface-collected several sherds of brown pottery, projectile points, side and end scrapers, flakes with fine retouching, pebble and core hammerstones, choppers, wedge-shaped and pebble manos, and slab metates (Kelley, Campbell, and Lehmer 1940:120).

Fieldwork

Surface features and diagnostic artifacts were instrument mapped using a theodolite. A number of surface artifacts and features not mentioned in the 1938 research were documented. The two main surface artifact concentrations, Area A in the northeast and Area B in the north, were selectively collected by the field school students. Notes were taken on the site, features, and artifacts by field school personnel. In Area B a variable sample of debitage (n=99) was collected. The resulting stone assemblage was used at base camp for instruction in lithic analysis.

Features

A total of 13 prehistoric features were recorded on the site: 12 small circular stone hearths with open centers and 1 possible incipient ring midden. All but two of the hearths were arranged in a linear fashion from northeast to southwest across the site. Although subject to sheet washing, most of these hearths appeared intact. A number of the features appeared to have associated debitage—especially near the erosional gully in the northern portion of the site. The incipient ring midden was located in the southeastern portion of the site.

Artifacts

There was a substantial debitage scatter throughout; however, most surface cultural material was exposed in an eroded area in the north-northeast corner of the site. A thin scatter of fire-cracked rock was scattered across the site, with the greatest concentrations near hearths and within the northeast erosional area. Surface artifacts observed and collected within the site include a diminutive Paisano (500 B.C.–A.D. 1000) dart point (n=1; Area A), a Pandale (4000–2500 B.C.) dart point preform (n=1; Area A), two prismatic blades suggestive of Late Prehistoric Perdiz component (1200–1700 A.D.; Area B) technology, thick bifaces (n=4), bifacial knives (n=2), end scrapers (n=2), a hammerstone (n=1), cores (n=3),

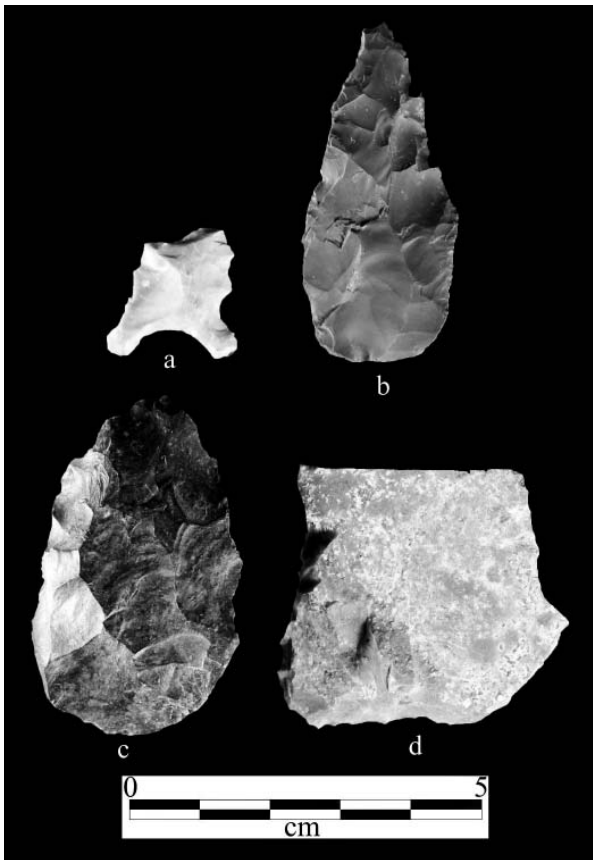


Figure 25. Artifacts collected from Area A at Site 41BS37. Photo: E. Blecha.

mano fragments, and biface thinning flakes (n=3) (Fig. 25; Tables 1 and 2). A sample of lithic debitage (n=99) was recovered from the Area B artifact concentrations. The debitage recovered from 41BS37 was used for classroom purposes at base camp, and as a representative toolstone sample from Calamity Creek. The toolstone consisted primarily of high-quality chalcedony, agate, and chert. No cultural material was observed in the cutbank exposure of Calamity Creek at the west edge of the site, where Kelley had conducted a 1938 test excavation.

An overview of the artifacts recovered from the surface of Site 41BS37 are provided in Tables 1 and 2.

Table 1: Collected surface artifacts from Area A at site 41BS37

Type	Material	Color	Description	Length (mm)	Width (mm)	Thickness (mm)	Neck Width (mm)
Untyped Dart Point–Paisano	Chert	Bnd lt pink, gray	Specimen A1; Missing Distal Tip; Diminutive	–	18.6	5.4	13.1
Dart Point Preform	Jasper	Reddish-brown	Pandale Preform; Complete	48.8	22.6	6.2	–
Thick Biface	Chert	Black	Complete	48.8	30.8	12.3	–
End scraper	Hornfels	Drk brown	Large; Hand-held	80.5	65.7	36.3	–
Utilized Flake	Chert	Golden	Modified Flake; Scraper?	38.2	41.5	9.3	–
Hammerstone	Hornfels	Drk brown	Circular	86.2	80.5	48.7	–

Table 2: Collected surface artifacts from Area B at site 41BS37

Type	Count	Material	Color	Description
Knife	1	Chalcedony	Bnd white, translucent	Reworked; Fragment
Knife	1	Chert	Gold, drk red	Fragment
Knife	1	Claystone	Drk brown	Distal Fragment
Thick Biface	1	Chert	Bnd gold, red	Fragment
Thick Biface	1	Chert	Lt gray w/thin orange veins	–
Thick Biface	1	Chert	Lt pinkish-gray	Fragment
Thick Biface	1	Serpentine	Grayish-green	Fragment
End Scraper	1	Chert	Drk gray	Small
Biface Thinning Flake	1	Chert	Drk gray	–
Biface Thinning Flake	1	Chert	Lt pinkish-gray	–
Biface Thinning Flake	1	Rhyolite	Drk brown	Off a Large Biface
Blade	1	Chert	Var lt gray	Cortex on Platform
Blade	1	Felsite	Drk brown	Patinated on One Face
Utilized Flake	1	Chalcedony	Bnd lt gray, whitish-tan	–
Utilized Flake	1	Claystone	Red	Large; Heat Treated
Core	1	Chert	Drk maroon	Multidirectional
Core	1	Claystone	Bnd drk brown	Polyhedral
Core	1	Plume Agate	Mot purplish-red, bluish white	Fragment; Utilized?
Flake	1	Agate	Gray, mot w/ golden, pink	–
Flake	1	Andesite	Red	Large and Thick
Flake	1	Andesite?	Grayish-pink	Fragment
Flake	1	Basalt	Greenish-brown	Large
Flake	1	Chalcedony	Translucent bluish-white	–
Flake	1	Chert	Bicolored drk red, brown	–
Flake	1	Chert	Bnd grays	–
Flake	1	Chert	Drk brown	–
Flake	1	Chert	Drk green	Cortex on Dorsal Face
Flake	1	Chert	Drk gray	Complete
Flakes	2	Chert	Drk maroon w/ bluish-white inclusions	–
Flake	1	Chert	Gold, lt gray, drk gray, red	–
Flake	1	Chert	Goldish-gray	Complete
Flake	1	Chert	Lt grayish-green	–
Flake	1	Chert	Lt grayish-yellow	–
Flake	1	Chert	Lt yellowish-tan	–
Flake	1	Chert	Med gray	–

Table 2: Collected surface artifacts from Area B at Site 41BS37 *(continued)*

Type	Count	Material	Color	Description
Flake	1	Chert	Yellowish-red	Conglomerate Cortex on One Side
Flake	1	Claystone	Bnd lt, drk red	–
Flake	1	Quartzite	Bluish-white, tan	–
Flake	1	Quartzite	Purplish-gray	–
Flake	1	Quartzite	White	–
Flakes	11	Rhyolite	Drk brown	–
Flake	1	Rhyolite	Lt gray	–
Flake	1	Rhyolite?	Greenish-gray	Fragment
Flake	1	Serpentine	Med gray	2 Pieces - Refit
Flake	1	Unknown	Bnd black, tan	–
Flakes	3	Chert	Black	Maravillas Chert; 2 Fragments
Flakes	11	Chert	Bnd golds, red	–
Flakes	2	Chert	Drk red w/ bluish-white inclusions	–
Flakes	2	Chert	Drk reddish-brown	–
Flakes	3	Chert	Gold	–
Flakes	7	Chert	Gold w/bluish-white inclusions	–
Flakes	2	Chert	Grayish-gold	–
Flakes	4	Chert	Grayish-pink	–
Flakes	2	Chert	Lt tan	Cortex on Platforms
Flakes	2	Chert	Lt yellowish-gray, grayish-pink	–
Flakes	7	Chert	Mot gold, red, bluish-white	–
Flakes	2	Chert	Mot golds	–
Flake	1	Chert	White	–
Flakes	5	Claystone	Drk Maroon	–
Flakes	4	Claystone	Red	–
Flakes	2	Plume Agate	Mot purplish-red, bluish-white	–
Flakes	2	Serpentine	Grayish-green	–

Curious Lizard Site (41BS764)

The Curious Lizard site (41BS764) was discovered and formally recorded by Mike Davis of TPWD staff in June 1988. On June 10–11, 1996, the site was revisited by the SRSU archaeological field school team, and the site boundaries were expanded (Fig. 26). Curious Lizard is a prehistoric open site with a high concentration of surface artifacts and one hearth feature. The site is located on the west bank of Calamity Creek,

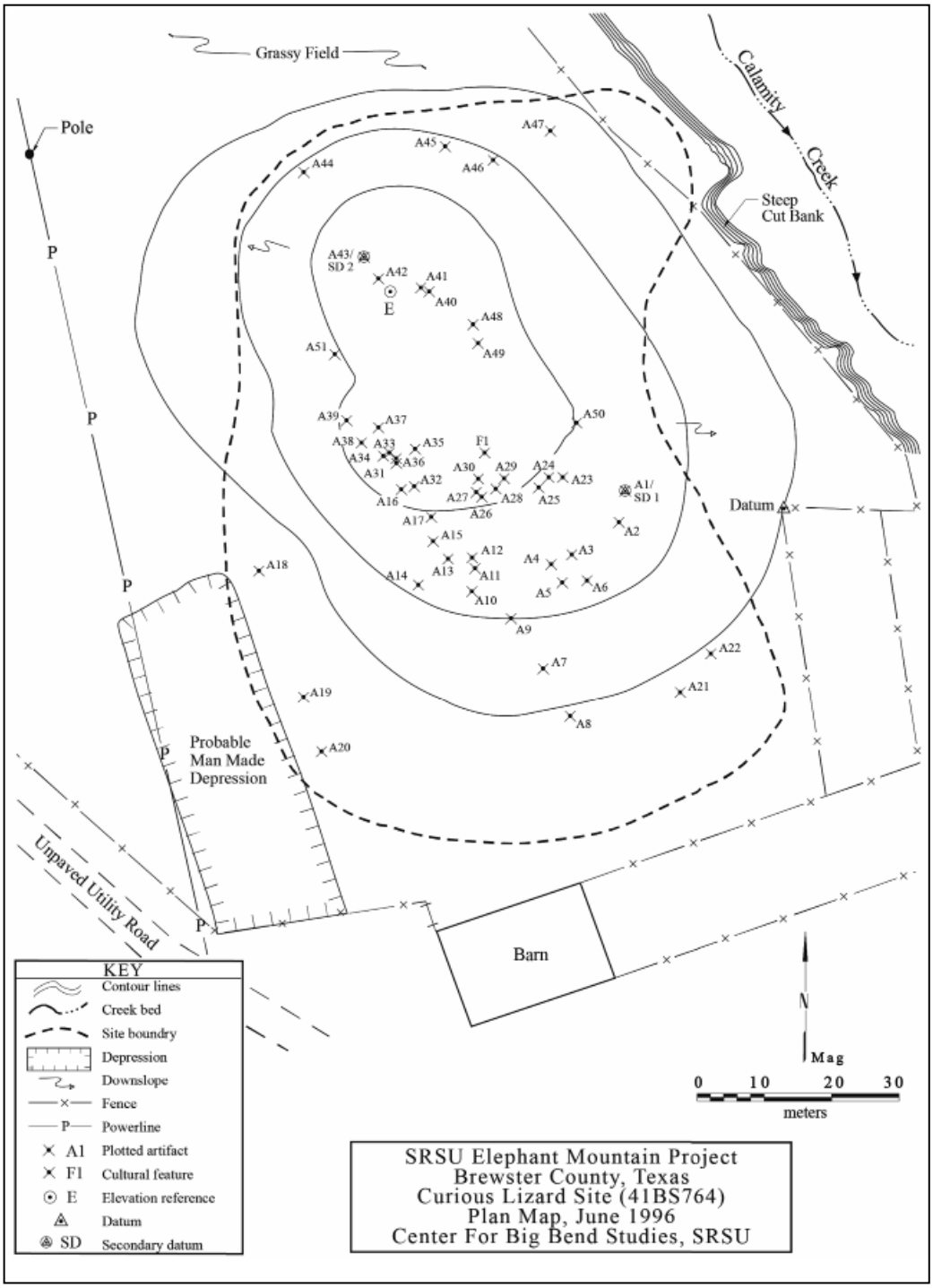


Figure 26. Plan map of Curious Lizard site (41BS764). Drafting: D. Hart.

ca. 75 m (246 ft) southwest of a low-water crossing along the road to WMA headquarters. The area is just northwest of a large eastward bend in Calamity Creek on which the Calamity Meander site (41BS1103) is found. The cultural deposit extends from the edge of the creek westward roughly 70 m (230 ft) to a human-made depression and telephone line. The long axis of the site roughly parallels the creek, trending N-NW to S-SW for a distance of ca. 120 m (394 ft) into a corral and modern barn complex. At the time of recording there was little vegetation due to overgrazing and drought-like conditions (Fig. 27). Vegetation present on the site includes honey mesquite (*Prosopis glandulosa*), prickly pear (*Opuntia* sp.), Russian thistle (*Salsola tragus*), and skeleton-leaf goldeneye (*Viguiera stenoloba*).

The site area exhibits signs of disturbance including grazing, occasional vehicle use along its eastern edge, and other ranching activities, some of which might have occurred before it became a wildlife management area. As would be expected, there is erosion along the eastern boundary where the site abuts the west bank of Calamity Creek.

Based on diagnostic surface artifacts, the Curious Lizard site is inferred to have cultural components of Early Archaic (ca. 6500–2500 B.C.) and Late Prehistoric (ca. A.D. 700–1535) periods. A series of untyped dart points from the site suggests that additional Archaic periods may be represented as well. In sum, there is a likelihood that the site contains buried intact features and other cultural deposits that

Figure 27. Looking northeast across the Curious Lizard site (41BS764). Photo: R. Mallouf.

could significantly add to our knowledge of prehistory in the region.

Fieldwork

On June 10 and 11, 1996, the Curious Lizard site was intensively surveyed, mapped, and selectively surface-collected by field school personnel. A mapping datum was placed on the corner of a fenced corral, roughly at the center of the site. Hand-held Suunto compasses and 50-meter tapes were used to map and perform controlled artifact collection at the site. An elevation reference datum was placed at the north-center of the site. The single hearth feature (F1) and 51 surface artifacts were mapped in place. No subsurface excavation was conducted at this time.

Feature

There is a notable scatter of fire-cracked rock across the surface of the site; however, only one partially intact feature could be discerned in the northern portion of the site. The feature is an amorphous, scattered hearth measuring ca. 180 x 80 cm (71 x 31 in). The hearth appears to have been disturbed such that the original measurements would have likely been more compact. The hearth is comprised of 9 to 10 stones, each having diameters of roughly 15 cm (6 in). Most of these stones are embedded in the ground surface and are minimally fire cracked. It is possible that this feature still retains some intactness below ground surface. Given the depositional history of the site, it is also likely that more subsurface features are present.

Artifacts

Despite being disturbed by ranching activities, the Curious Lizard site yielded a number of formal stone tools, particularly in its central and northern areas. A total of 51 functionally and/or temporally diagnostic artifacts, 19 of which were arrow points, were recorded on the ground surface (Table 3). They include Pandale (4000–2500 B.C.) dart points (n=3), several untyped dart points (n=3), Perdiz (A.D. 1200–1700) arrow points (n=4), Cliffton arrow points (n=2), Livermore (A.D. 800–1350) arrow points (n=2), untyped arrow points (n=11), a mano (n=1), hammerstones (n=4), utilized flakes (n=6), a biface thinning flake (n=1), a spokeshave (n=1), cores (n=3), end scrapers (n=3), end and side scrapers (n=2), and miscellaneous bifaces (n=5) (Figs. 28, 29, 30, and 31). Many of these tools were manufactured from high-grade cherts and chalcedonies, as well as agate, jasper, quartzite, felsite, rhyolite, hornfels, and indurated tuff. The umbo of a freshwater bivalve (A26) was also recovered from the site.

Pandale Dart Points (3 collected specimens)

Specimen A9 (Fig. 28): The stem of a Pandale dart point, this specimen has slightly expanding edges and a convex basal edge with a slight indent in the center. The basal edge measures 15 mm (.6 in) wide. A large hinge fracture removed the stem from the body of the projectile point. The specimen is manufactured from dark green jasper.

Table 3: Surface artifacts at the Curious Lizard site (41BS764)

Spec. No.	Type	Material	Collected Yes/No	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
1	Untypable Arrow Point	Chert	Yes	24.6	16.6	3.6	–
2	Core	Chert	No	–	–	–	–
3	Utilized Flake	Rhyolite	No	–	–	–	–
4	Biface	Chert	No	–	–	–	–
5	Side and End Scraper	Rhyolite	Yes	76.2	50.8	17.5	–
6	Untypable Arrow Point	Chert	Yes	24.1	15.3	3.2	5.5
7	Biface	Agate	No	–	–	–	–
8	Utilized Flake	Chert	No	–	–	–	–
9	Pandale Dart Point	Jasper	Yes	–	18.5	6.7	–
10	Hammerstone	Agate	No	–	–	–	–
11	Perdiz Arrow Point	Chert	Yes	27	–	3.4	6.7
12	Hammerstone/mano	N/A	No	–	–	–	–
13	Untypable Arrow Point	Chert	Yes	–	13.4	3.1	5.9
14	Pandale Dart Point	Chert	Yes	–	–	6.7	12.6
15	Livermore Arrow Point	Chert	Yes	26.1	14.6	3.9	7.3
16	Untypable Arrow Point	Chert	Yes	–	17.3	3.5	4.4
17	Untypable Arrow Point	Chalcedonic Chert	Yes	–	16.4	4.2	4.8
18	Untypable Dart Point	Chert	Yes	–	–	6.3	–
19	Spokeshave	Felsite	No	–	–	–	–
20	Livermore Arrow Point	Jasper	Yes	–	–	3	7.4
21	Core	Felsite	No	–	–	–	–
22	Utilized Flake	Chert	No	–	–	–	–
23	Hammerstone	Chalcedony	No	–	–	–	–
24	Untypable Arrow Point	Chert	Yes	24.3	11.2	1.9	6.2
25	Core	Chert	No	–	–	–	–
26	Umbo bivalve shell frag	Shell	Yes	–	–	–	–
27	Cliffton Arrow Point	Chert	Yes	–	16.7	2.5	10.4
28	Untypable Arrow Point	Chert	Yes	30.1		2.5	5.5
29	Untypable Arrow Point	Chert	No	–	–	–	–
30	Biface	Chert	No	–	–	–	–
31	End scraper	Chert	Yes	44.1	31.1	9.9	–
32	End Scraper	Chert	Yes	69.2	49.8	12.9	–
33	Untypable Arrow Point	Chert	Yes	–	19.3	3.9	7.8

Table 3: Surface artifacts at the Curious Lizard site (41BS764) *(continued)*

Spec. No.	Type	Material	Collected Yes/No	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
34	Utilized Flake	Rhyolite	Yes	58.6	45	16.2	–
35	Perdiz Arrow Point	Chert	Yes	–	16.8	2.4	5.8
36	Biface Thinning Flake	Hornfels	Yes	35.9	27.6	4.7	–
37	Cliffton Arrow Point	Chert	Yes	–	17.4	3	7.7
38	Utilized Flake	Chert	No	–	–	–	–
39	Untypable Dart Point	Chert	Yes	44.7	24.8	4.5	15.9
40	Perdiz Arrow Point	Chert	Yes	23.3	–	1.7	4.3
41	Untypable Arrow Point	Chert	No	–	–	–	–
42	Mano	Quartzite	No	–	–	–	–
43	Pandale Dart Point	Chert	Yes	38.6	14.8	7.5	11.8
44	Untypable Arrow Point	Chert	No	–	–	–	–
45	Biface	Felsite	No	–	–	–	–
46	Perdiz Arrow Point	Chalcedony	Yes	–	15.9	2.6	5.9
47	Utilized flake	Chalcedony	No	–	–	–	–
48	End scraper	Felsite	No	–	–	–	–
49	Scraper	Chert	No	–	–	–	–
50	Biface	Chert	No	–	–	–	–
51	Hammerstone	Pruett Tuff	No	–	–	–	–

Specimen A14 (Fig. 28): This specimen has two impact fractures that removed the distal tip and an entire blade edge just above the stem. The stem greatly expands to a moderately convex basal edge. The remaining blade edge is straight and strongly serrated, while the shoulder is strong and slopes downward into the stem neck. The specimen is plano-convex in cross section and the ventral surface is still present on the face of the blade. The unidentified toolstone is mottled yellowish-brown with some red.

Specimen A43 (Fig. 28): Specimen A43 is a diminutive Pandale dart point with an off-set blade with convex blade edges. Both shoulders are weak, and the stem is long with parallel sides that expand slightly just above the basal edge. The basal edge is convex and as wide as the blade base. The distal blade tip is thinned and heavily beveled on one edge, giving the specimen the iconic "corkscrew" twist common to Pandale dart points. The toolstone is yellowish-brown chert.

Untypable Dart Points (2 collected specimens)

Specimen A18 (Fig. 28): Specimen A18 has a wide triangular blade with straight, serrated blade edges. This specimen likely had long thick barbs; however, a large hinge

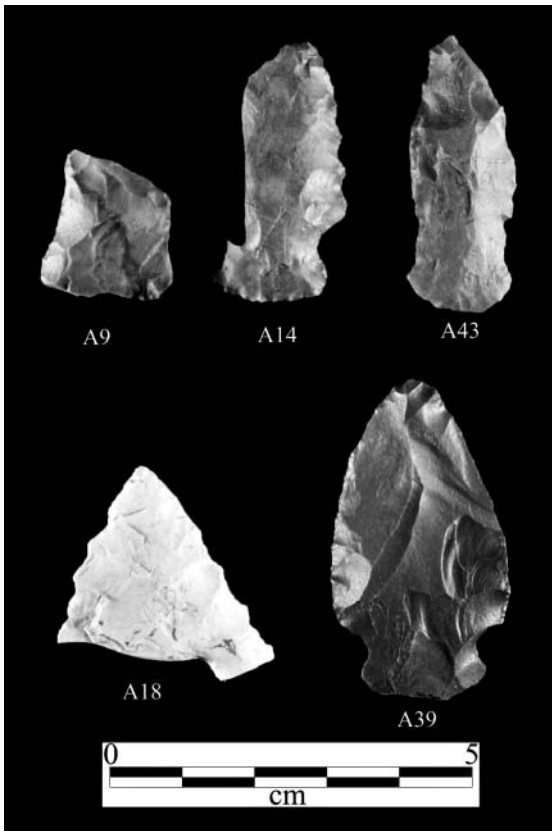


Figure 28. Surface-collected dart points from the Curious Lizard site (41BS764). Photo: E. Blecha.

fracture removed one barb and the stem, and another hinge fracture removed most of the other barb. Fashioned from white chert, this specimen is well made and likely reworked. A "knot" is present along the lateral blade margin where the specimen could not be adequately thinned.

Specimen A39 (Fig. 28): Made of a red and yellowish-brown banded chert, this untyped dart point is unique in that it is minimally worked. It has strong convex lateral edges and a convex basal edge. Specimen A39 has shallow corner notches, a short expanding stem, and moderate shoulders that are slightly sloped. Manufactured from a flake, the specimen is plano-convex in cross section, and retains the original flake curvature. The ventral surface remains largely unworked except for the basal edge. One lateral blade edge and the bulb of percussion is partially thinned. The dorsal side is minimally retouched as well—a few thinning flakes are removed from the base and midsection. The specimen exhibits light left-hand alternate beveling.

Cliffton Arrow Points (2 collected specimens)

Specimen A27 (Fig. 29): Made from a yellowish-brown chert flake or blade, this specimen is unifacially worked except for the stem. This specimen has a sharply contracting stem and a pointed-convex basal edge. The specimen has one horizontally protruding barb and one strong shoulder. The neck of the stem is as wide as the base of the blade. Most of the blade is missing.

Specimen A37 (Fig. 29): Morphologically similar to Specimen A27, this specimen is made from a white chert flake or blade. As in the case of Specimen A27, this specimen is unifacially worked except for the stem, and has one strong shoulder and one laterally protruding barb. It also has a sharply contracting stem with a wide neck. The distal tip is missing, and the bulb of percussion is not discernible.

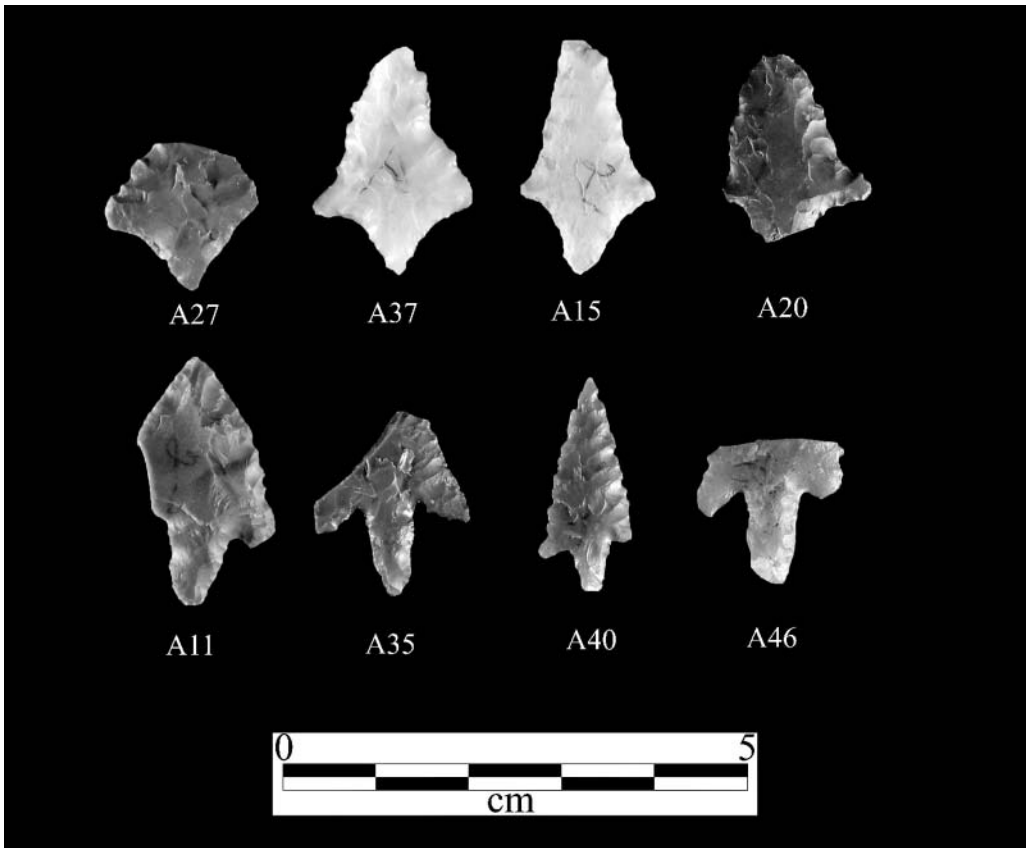


Figure 29. Surface-collected Cliffton, Livermore, and Perdiz arrow points from the Curious Lizard site (41BS764). Photo: E. Blecha.

Livermore Arrow Points (2 collected specimens)

Specimen A15 (Fig. 29): This Livermore arrow point is bifacially worked and has serrated, concave lateral blade edges and laterally protruding barbs. The stem gradually contracts from the barbs to the narrow convex basal edge. A "knot" is present on the lateral margin of the stem where the specimen could not be adequately thinned. Specimen A15 is manufactured from a light tan chert flake or blade.

Specimen A20 (Fig. 29): Made from dark green jasper, this Livermore arrow point has slightly convex lateral blade edges and a convex distal tip. The specimen is missing the stem just below the neck. Both barbs protrude horizontally from the neck and lateral blade edges—one is reworked and smaller. The specimen is bifacially worked; however, parent flake scar remnants are still visible.

Perdiz Arrow Points (4 collected specimens)

Specimen A11 (Fig. 29): Made of dark gray chert, this Perdiz arrow point has convex lateral blade edges and a long contracting stem with a convex basal edge. The specimen has a large snap fracture on one side, removing one of the barbs and half of the blade. The other barb is also snapped but a good portion of it remains. The specimen still retains the curvature of the flake, and the ventral face is worked on the distal blade face where the bulb of percussion is still prominent. The blade exhibits light right-hand alternate beveling.

Specimen A35 (Fig. 29): Specimen A35 is corner notched with a broad triangular blade, and a long contracting stem. This specimen has two hinge fractures, removing most of the blade. However, both barbs are long and still intact. Both faces of the specimen are worked, especially the barbs and the stem. The portion of the blade that is still intact reveals a smooth ventral face. Manufactured from a yellowish-brown chert flake or blade, what remains of the specimen is well executed.

Specimen A40 (Fig. 29): The smallest of the Perdiz arrow points, this specimen has a long and narrow serrated blade and a contracting stem. A portion of the stem is snapped off as well as one barb. The remaining barb is prominent and flares out slightly. The toolstone used to manufacture this specimen is high-quality bluish-gray chert (Balmorhea Blue?). One face exhibits parallel oblique flaking. This specimen is extremely thin and well made.

Specimen A46 (Fig. 29): This specimen is morphologically very similar to, and fractured in the same area, as specimen A35. Specimen A46 is corner notched with a broad triangular blade. Most of the blade is missing, leaving a long contracting stem and two barbs—one is long and intact while the other is reworked into a smaller round barb. The stem is long and contracting with a convex base; both faces of the stem are worked. The barbs and the blade are unworked on the ventral face. The parent material is yellowish-tan chalcedony.

Untypable Arrow Points (3 uncollected specimens; 8 collected specimens)

Three untyped miscellaneous arrow point fragments were recorded but not collected from the Curious Lizard site (41BS764). Two specimens were manufactured from gray chert (A29, A41), and one medial fragment was made from white chert (A44). The following descriptions are of the collected untypable arrow point specimens.

Specimen A1 (Fig. 30): Specimen A1 is an ovate, lanceolate arrow point preform with convex lateral edges. Manufactured from tan fossiliferous chert, this specimen is unifacially worked on the dorsal face. The basal edge is concave and as wide as the lateral edges. The specimen is plano-convex in cross section, with a slight curve of the

flake from which it was manufactured. The extreme distal tip is missing.

Specimen A6 (Fig. 30): This specimen has one straight blade edge and one extremely recurved blade edge. Both blade edges are moderately serrated. The specimen has one small barb and one prominent shoulder. A portion of the stem is missing. Manufactured from a light tan chert flake or blade, this specimen was minimally worked on both faces. Remnant flakes can still be seen on the dorsal face, and compression rings and the bulb of percussion are apparent on the ventral face.

Specimen A13 (Fig. 30): This specimen has a heavily reworked blade. Both lateral blade edges are approximately 12 mm (.5 in) long, and the blade width is almost as wide as the narrow neck. Despite this, the ventral surface is still present in the middle of the specimen. A hinge fracture removed the stem just below the neck. One barb protrudes horizontally, while the other barb is smaller and curved downward. This specimen is manufactured from a dark gray chert flake or blade.

Specimen A16 (Fig. 30): Specimen A16 has slightly concave and serrated lateral

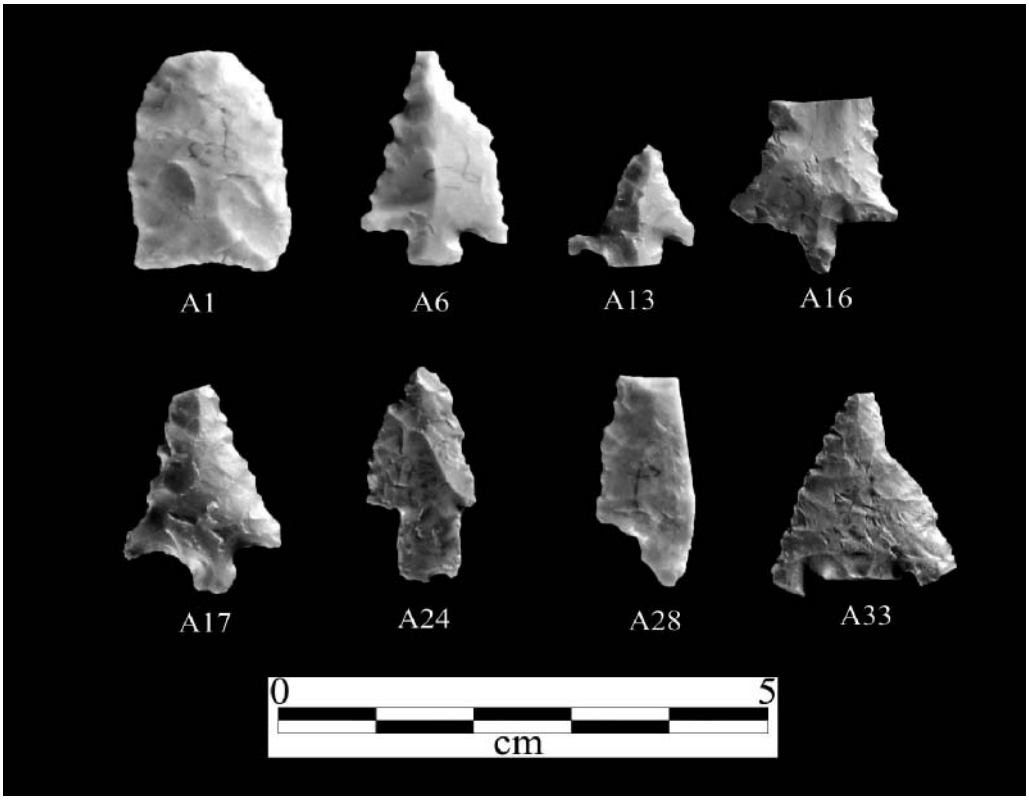


Figure 30. Surface-collected untyped arrow points from the Curious Lizard site (41BS764). Photo: E. Blecha.

blade edges and moderate barbs that protrude horizontally. The short contracting stem has a narrow neck and a pointed-convex basal edge. The original interior flake surface is still present on half of the ventral face. Manufactured from a yellowish-brown chert blade or flake, the specimen is bifacially worked on the stem and one lateral blade edge.

Specimen A17 (Fig. 30): Manufactured from banded brown chalcedonic chert flake or blade, this specimen has straight and moderately serrated lateral blade edges. The barbs are moderately long and slightly down-curved. The stem is very short with a convex basal edge; however, it is possible that the stem snapped off due to an inclusion in the toolstone. The specimen is lenticular in cross section and both faces are completely worked.

Specimen A24 (Fig. 30): Specimen A24 has a long stem compared to its blade element. The stem has parallel sides, a straight basal edge, and is relatively wide. The lateral blade edges are moderately and slightly convex respectively. This specimen is missing the extreme distal blade tip, a portion of the basal edge, and a barb. The other barb was reworked into a weaker shoulder. Made out of a banded yellowish-brown chert flake, the bulb of percussion is still present at the base of the stem.

Specimen A28 (Fig 30): Specimen A28 has a long triangular blade and a shorter contracting stem, and it is possibly a Perdiz arrow point preform. This specimen is plano-convex in cross section and is likely manufactured from a light grayish-tan chert blade because it has no curvature. The ventral face is unaltered and a portion of the bulb of percussion is still present at the distal tip. The specimen has one strong shoulder that slopes into the stem. A large snap fracture removed most of the right lateral blade and shoulder. The distal end of the stem is fractured as well.

Specimen A33 (Fig. 30): This specimen has the widest blade element of the arrow points from this site. One blade edge is straight and moderately serrated; the other is straight with a concave indent at the distal tip. This indent appears intentionally made and may have functioned as a spokeshave. The barbs and the stem are snapped just below the neck. This specimen is bifacial and well made and is manufactured from yellowish-brown mottled chert.

Bifaces (5 uncollected specimens)

Five bifaces were recorded but not collected from the Curious Lizard site. Their descriptions are as follows: two white chert biface fragments (A4 and A30), one gray agate biface fragment with utilized edges (A7), a crude biface (possibly a knife) with utilized edges made of dark gray felsite (A45), and a bluish-gray chert biface fragment (A50).

Spokeshave (1 uncollected specimen)

Specimen A19 is a dark brown felsite spokeshave that was not collected.

End Scrapers (1 uncollected specimen; 2 collected specimens)

A tan felsite end scraper (A48) was recorded but not collected on the site. The following descriptions are for the collected specimens only.

Specimen A31 (Fig. 31): Specimen A31 is a small, domed end scraper that is extremely well made and manufactured from high-quality bluish-gray chert. The distal end is trimmed to a steep and wide convex bit, while the lateral edges contract towards a narrower base. All edges of this specimen are worked and beveled. The curve of the flake is still present and curves down at the distal end. The bulb of percussion is thinned out on the ventral face. On the dorsal face, a thinning flake from the base towards the center terminates on the domed portion of the specimen. The right lateral blade edge is reworked into a graver. This specimen was likely hafted.

Specimen A32 (Fig. 31): This likely hand-held end scraper is made from a large mottled dark gray chert flake that is minimally modified. The dorsal face is covered in cortex except for three large thinning flakes removed from the platform and the worked distal end. The specimen is triangular in shape and is thickest at the platform, gradually thinning towards the distal end. The distal end is convex and exhibits strong unifacial beveling.

Side and End Scrapers (1 uncollected specimen; 1 collected specimen)

A yellow banded chert scraper fragment (A49) was recorded but not collected on the

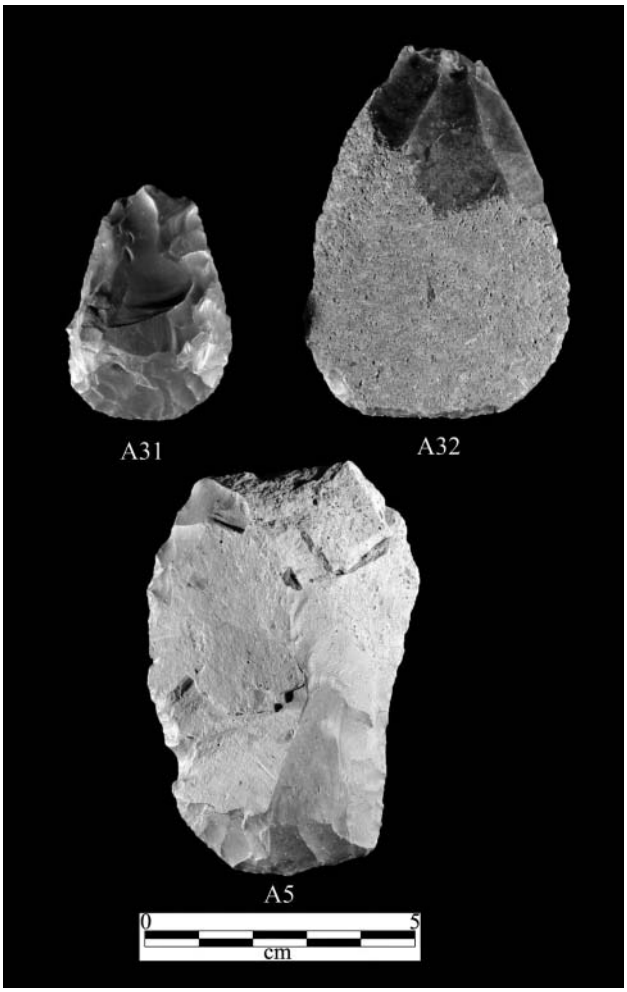


Figure 31. Surface-collected scrapers from the Curious Lizard site (41BS764). Photo: E. Blecha.

site. The following descriptions are of the collected end and side scraper specimen only.

Specimen A5 (Fig. 31): This large ovoid side and end scraper has one convex and one concave lateral edge. Made from a large rhyolite flake that varies from fine-grained purplish-red to grainy light gray, this scraper has a plano-convex cross section. The specimen is unifacially worked on the dorsal face. Both lateral edges are worked (one side into a concave edge), and the distal end is beveled.

Biface Thinning Flake (1 collected specimen)

Specimen A36 : Specimen A36 is a large dark brown hornfels biface thinning flake. The flake is relatively thin and the distal and lateral edges are snapped off. One of the flat snapped edges is utilized. The platform is prepared and ground and there are remnant flake scars present on the dorsal surface. A concave indent lies just above the platform and the opening measures roughly 10 mm (.4 in) wide and may have served as a spokeshave.

Utilized Flakes (5 uncollected specimens; 1 collected specimens)

Six utilized flakes were recorded within the Curious Lizard site, one of which was collected (A34). The parent stones for the uncollected specimens consist of dark brown felsite (A3), off-white chert (A22), red chalcedony (A47), reddish-brown chert (A38), and an unspecified color chert (A8). The following description is of the collected utilized flake.

Specimen A34: Made from dark gray rhyolite, this specimen is a round, thick, asymmetrical flake tool with heavily utilized lateral and distal edges. The striking platform is covered in cortex and the bulb of percussion is prominent.

Cores (3 uncollected specimens)

Three cores were recorded but not collected from the site. They are of dark gray chert (A2), dark reddish-brown felsite (A21), and banded brown chert (A25).

Hammerstones (4 uncollected specimens)

Three hammerstone tools and one hammerstone mano two-sided tool (A12) were recorded but not collected from the site. Toolstone materials include brown agate (A10), brown chalcedony (A23), and indurated tuff (A52). No material type was noted for Specimen A12.

Mano (1 uncollected specimen)

A reddish-brown quartzite one-sided mano was recorded but not collected from the site.

Shell A26 (1 collected specimen)

A fragmented fresh-water mussel shell, species unknown, was recovered from the surface of the site.

Site 41BS810

Site 41BS810 is an extensive open prehistoric site with thermal features that is located on the western bank of Calamity Creek, just east of Texas State Highway 118. Mike Davis originally recorded this site in 1988 for the TPWD, and on June 18, 1996, the SRSU field school crew updated documentation for the site (Fig. 32). Based on the surface extent of cultural debris and features, the site measures ca. 580 m (1,903 ft) (N-S) by 100 m (328 ft) (E-W). A roadside park on the east side of Highway 118 marks the northern boundary of the site, which then extends southward between the highway and creek almost to the WMA headquarters entrance road.

The site, which lies within an active cattle grazing area, is crossed by a pasture road that parallels the highway. Undoubtedly, the construction of Texas State Highway 118 and the roadside park impacted the site. Impacts from cattle grazing, ranching roads, and erosion are also evident. The site area is heavily vegetated, particularly in its northern extent and along the terrace above Calamity Creek. On-site vegetation includes honey mesquite (*Prosopis glandulosa*), fourwinged saltbush (*Atriplex canescens*), tarbush (*Flourensia cernua*), allthorn (*Castela erecta texana*), Russian thistle (*Salsola tragus*), buffalograss (*Buchloe dactyloides*), western hackberry (*Celtis reticulate*), creosote bush (*Larrea tridentata*), and desert bunch grasses.

At the time of recording, no buried cultural materials were observed in the cutbank; however, such material may be buried in other areas of the site. Current (2017) aerial imagery of the site suggests that the bluff face delineating the eastern boundary of the site has eroded since the 1996 SRSU field school visit (Fig. 33).

Fieldwork

On June 18, 1996, Site 41BS810 was extensively surveyed and surface-collected by the field school participants. A primary mapping station was established in the north-central portion of the site. The large size of the site, along with dense vegetation that often obscured visibility, made necessary the establishment of three additional mapping datums. The cultural and noncultural features of the site were instrument mapped along with 31 formally and/or temporally diagnostic surface artifacts. The 13 thermal features and 1 possible burial feature were recorded, measured, and described. The 31 mapped artifacts were collected along with 5 additional artifacts which were collected without provenience.

Features

Exposed on the surface of Site 41BS810 are 13 thermal features (F2–F14) and one large concentration of cobbles (F1), the latter is possibly a burial (Table 4). Features are most prominent on the east-central side of the site along the Calamity Creek cutbank. Many of the features in the northern portion of the site are difficult to discern due to thick vegetation. The visible thermal features include 11 hearths and 2 firecracked rock concentrations (F5 and F11). All the thermal features have been disturbed, likely by cattle, and now measure over 100 cm (39 in) in diameter—the

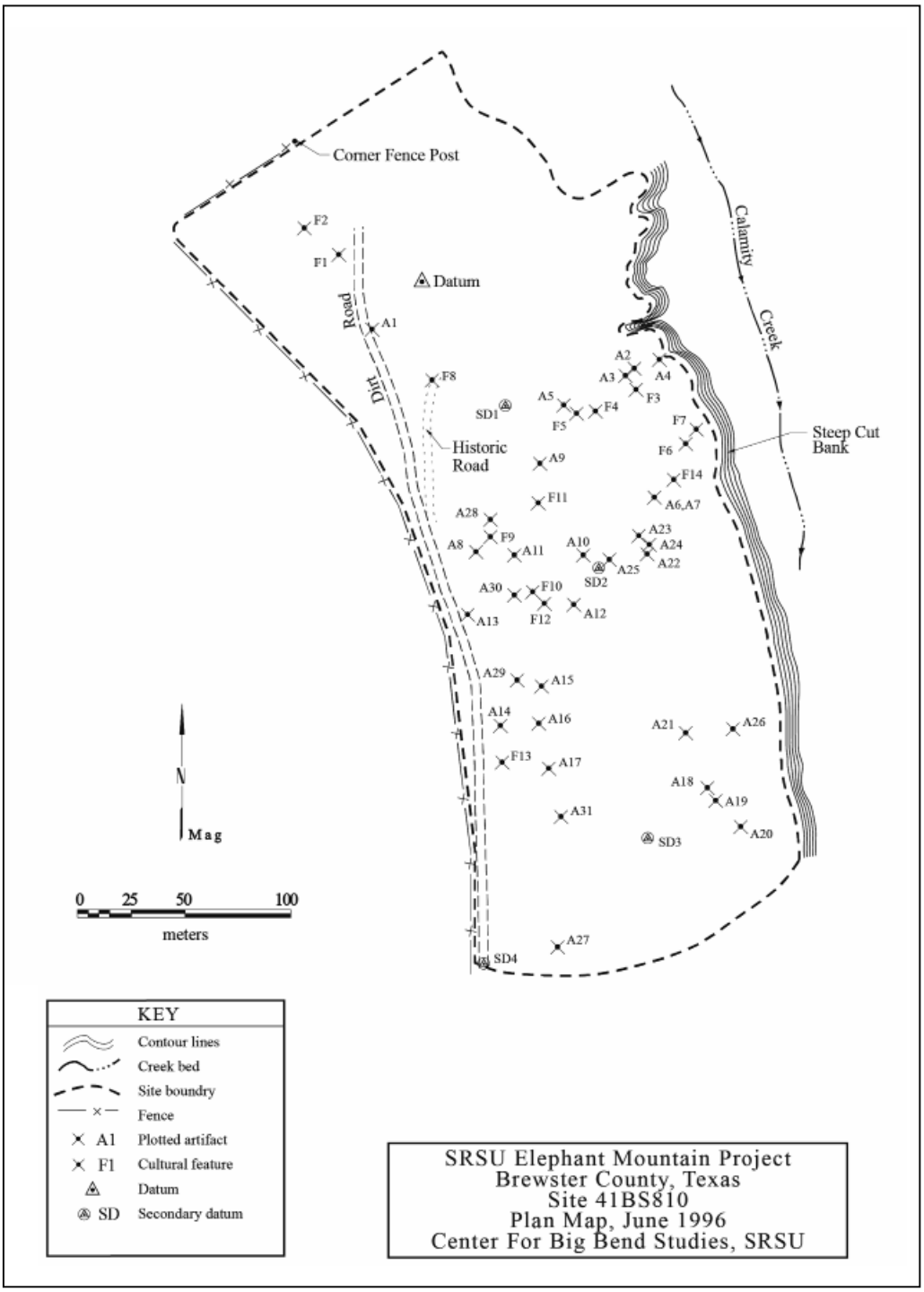


Figure 32. Plan map of Site 41BS810. Drafting: D. Hart.

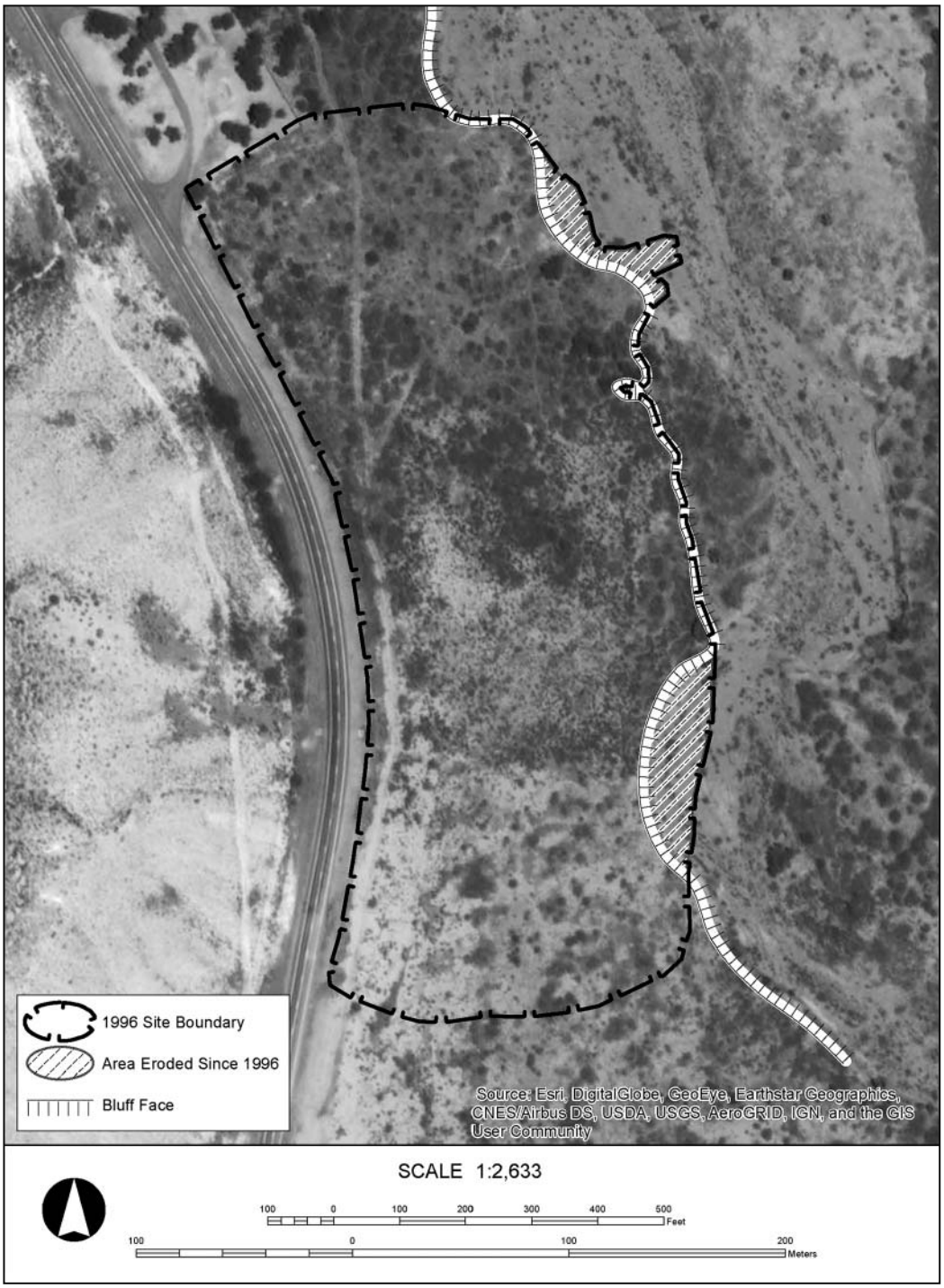


Figure 33. Aerial map of Site 41BS810 showing erosion of the western cutbank of Calamity Creek that occurred after 1996 (outlined in white). Graphics: E. Blecha.

Table 4: Surface features at Site 41BS810

Feature #	Type	Shape	Dimensions (cm)	Condition	% of Intactness
1	Possible Burial	Oval	200 x 160	Partially Intact	90
2	Hearth	Circular	85	Partially Intact	80
3	Hearth	Amorphous	n/a	Scattered	<10
4	Hearth	Circular	100	Partially Intact	50
5	FCR Concentration	Oval	600 x 300	Scattered	<10
6	Hearth	Linear	130	Scattered	<10
7	Hearth	Oval	110 x 60	Partially Intact	20
8	Hearth	Oval	110 x 130	Partially Intact	70
9	Hearth	Oval	150 x 120	Partially Intact	65
10	Hearth	Circular	140	Partially Intact	55
11	FCR Concentration	n/a	400 x 250	Scattered	<10
12	Hearth	Circular	55	Partially Intact	45
13	Hearth	Circular	70	Partially Intact	20
14	Hearth	Oval	250	Partially Intact	45

n/a = not addressed in field notes

original measurements of these features were likely more compact. The most common stones used in the thermal features are vesicular basalt and limestone, and they average 13 cm (5 in) in diameter. One hearth (F13) is associated with a slab metate, located 1.2 m (4 ft) to the north of the hearth.

The possible burial feature (F1) is oval and measures 200 x 160 cm (79 x 63 in). All associated rocks—the largest of which is ca. 30 x 40 cm (12 x 16 in)—appear to be stream-rounded and show no signs of thermal fracturing. The feature is mainly comprised of igneous rocks.

Artifacts

This large site contains a wide range of artifacts and numerous thermal features exposed on the surface. Artifacts are concentrated mainly in the central to southern portions of the site. Material types include high-quality chert, chalcedony, jasper, agate, silicified wood, felsite, and andesite. The lithic materials are of an exceptional quality, mirroring the high-quality lithic sources that occur in Calamity Creek and the general area. Many of the tools, and much of the debitage, are associated with scattered fire-cracked rock and/or hearth features.

Thirty-one artifacts were mapped and collected, and five additional specimens were collected using the "grab bag" method—i.e., without provenience—at a later date (Table 5; Figs. 34, 35, 36, and 37). For descriptive purposes, the grab bag specimens are described below along with the provenienced specimens. The five grab bag specimens are as follows: a knife, two flakes, a Paleoindian Dalton dart point (8500–7900 B.C.), and one Late Paleoindian Angostura dart point (7700–5550 B.C.).

Provenienced artifacts include an Ensor dart point (200 B.C.–A.D. 1000; n=1); a Paisano dart point (500 B.C.–A.D. 800; n=1); Frio dart points (200 B.C.–A.D. 500; n=2); a Shumla dart point (1300–200 B.C.; n=1); untyped dart points (n=3); Livermore arrow points (A.D. 800–1350; n=2); Perdiz arrow points (A.D. 1200–1700; n=4); a Cliffton arrow point (n=1); untyped arrow points (n=5); a knife (n=1); an arrow preform (n=1); thick and thin bifaces (n=2); an end scraper (n=1); a hammerstone (n=1); and utilized flakes (n=3). As noted earlier, many of the provenienced tools were found near hearth features—primarily in the south-central portion of the site. A slab metate was also recorded on the site, located 1.2 m (3.9 ft) north of a partially intact hearth (F13). Diagnostic artifacts indicate Paleoindian (8500–5550 B.C.), Late Archaic (1000 B.C.–A.D. 700), and Late Prehistoric (A.D. 700–1535) occupations at Site 41BS810.

Angostura Dart Point (1 specimen)

Grab Bag Specimen A (Fig. 34): This thin lanceolate point has a diamond-shaped body and a concave basal edge. The proximal blade edges, or hafting element, are well ground and contracting, and the lateral blade edges are straight. The flaking patterning is loosely parallel and the thinning flake facets are worn. Several minor "knots" are exhibited on either face of the specimen where the toolstone could not be effectively thinned. This specimen is made from an orange-red fine-grained andesite flake. Overall, this specimen is well executed.

Dalton Dart Point (1 specimen)

Grab Bag Specimen B (Fig. 34): This well-made specimen exhibits strong alternate beveling along straight, carefully serrated blade edges. The hafting element is wider than the blade element—likely due to reworking—and ground dull. The lateral edges of the hafting element are straight to slightly concave. The basal edge is strongly concave with a deep U-shaped indent. The specimen is made from high-quality yellow-translucent chalcedony.

Ensor Dart Points (1 specimen)

Specimen A3 (Fig. 34): This dart point is complete, well thinned, and well made. It has a narrow and long blade element with slightly concave lateral blade edges. The specimen has moderately deep and narrow corner notches and small barbs. The stem is short and expands to a convex basal edge that is as wide as the base of the blade element. The specimen is made from heat-treated red and white banded chert.

Frio Dart Points (2 specimens)

Specimen A16 (Fig. 34): Made from red and yellow heat-treated agate, this dart point is small with convex lateral edges and one shallow side notch. The basal edge is convex with a deep U-shaped indent and rounded basal ears (one is missing) that are slightly flared. The specimen is widest at the base.

Specimen A30 (Fig. 34): This specimen is the exact size and morphology as specimen A16. The only difference is one of the basal ears is reworked and much shorter and

Table 5: Recorded and collected surface artifacts at Site 41BS810

Spec No.	Type	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
1	Thin Biface	Silicified Wood	–	36.2	8.2	–
2	End Scraper	Chert	57.9	46.6	18.7	–
3	Ensor Dart Point	Chert	43.3	21.2	5.3	13.2
4	Arrow Preform	Jasper	42.6	19.8	10.8	–
5	Scraper	Chert	45.9	49.4	15	–
6	Knife	Chert	–	36.4	6.1	–
7	Untyped Arrow Point	Jasper	–	16.2	4.2	6.7
8	Untyped Arrow Point	Chert	–	15.2	4.4	–
9	Perdiz Arrow Point	Chert	–	17.1	2.9	6.4
10	Untyped Arrow Point	Chert	–	9.6	2.1	–
11	Untyped Dart Point	Chert	–	18.9	5.2	–
12	Hammerstone	Andesite	63.4	66.2	46.4	–
13	Knife	Chert	–	37.1	6.8	–
14	Livermore Arrow Point	Agate	–	19	5.6	8.3
15	Paisano Dart Point	Chert	33.9	17.5	6.8	12.4
16	Frio Dart Point	Agate	–	17.5	5.8	–
17	Perdiz Arrow Point	Chert	–	–	2.8	–
18	Untyped Arrow Point	Chert	–	17	2.5	–
19	Cliffton Arrow Point	Chert	–	20.2	3.3	8.9
20	Utilized Flake	Chert	50.8	30.5	6.5	–
21	Utilized Flake	Silicified Wood	45.8	33.8	7.6	–
22	Thick Biface	Chert	45.1	30.6	11.6	–
23	Perdiz Arrow Point	Chert	30.7	14.6	3.7	7.8
24	Perdiz Arrow Point	Jasper	–	–	3.1	7.4
25	Livermore Arrow Point	Chert	–	17.6	3	6.4
26	Untyped Dart Point	Chert	–	16.6	6.4	13
27	Shumla Dart Point	Chert	–	24.6	5.8	12.8
28	Untyped Dart Point	Chert	28.8	18.1	4.8	9.4
29	Untyped Arrow Point	Chert	–	–	3.4	–
30	Frio Dart Point	Chert	–	17.5	6.8	–
31	Utilized Flake	Chert	–	25.8	5.1	–
Grab Bag-A	Angostura Dart Point	Felsite	49.4	21.1	6.2	–
Grab Bag-B	Dalton Dart Point	Chalcedony	37.4	15.1	4.4	–
Grab Bag	Flake	Chert	39.8	27.1	8.6	–
Grab Bag	Flake	Andesite	21.9	21.9	4.6	–
Grab Bag	Knife	Jasper	–	32.5	7.9	–

smaller. This specimen is made from light pink fossiliferous chert.

Paisano Dart Point (1 specimen)

Specimen A15 (Fig. 34): This side-notched specimen has a concave basal edge and rounded basal ears. The lateral blade edges are uniformly undulated on both sides. The specimen is made from light gray chert toolstone with red streaks.

Shumla Dart Point (1 specimen)

Specimen A27 (Fig. 34): This is a medial fragment of a shallowly corner-notched Shumla dart point. The specimen has small barbs and a slightly expanding stem with rounded basal corners suggesting a convex basal edge; however, most of the basal edge is missing. The toolstone is light pink chert.

Untyped Dart Points (3 specimens)

Specimen A11 (Fig. 34): Specimen A11 is the expanding stem fragment of an untyped dart point. The basal edge is moderately convex and the lateral edges are concave. The neck is wider than the basal edge, which is uniformly thinned. The toolstone is dark and light brown banded chert.

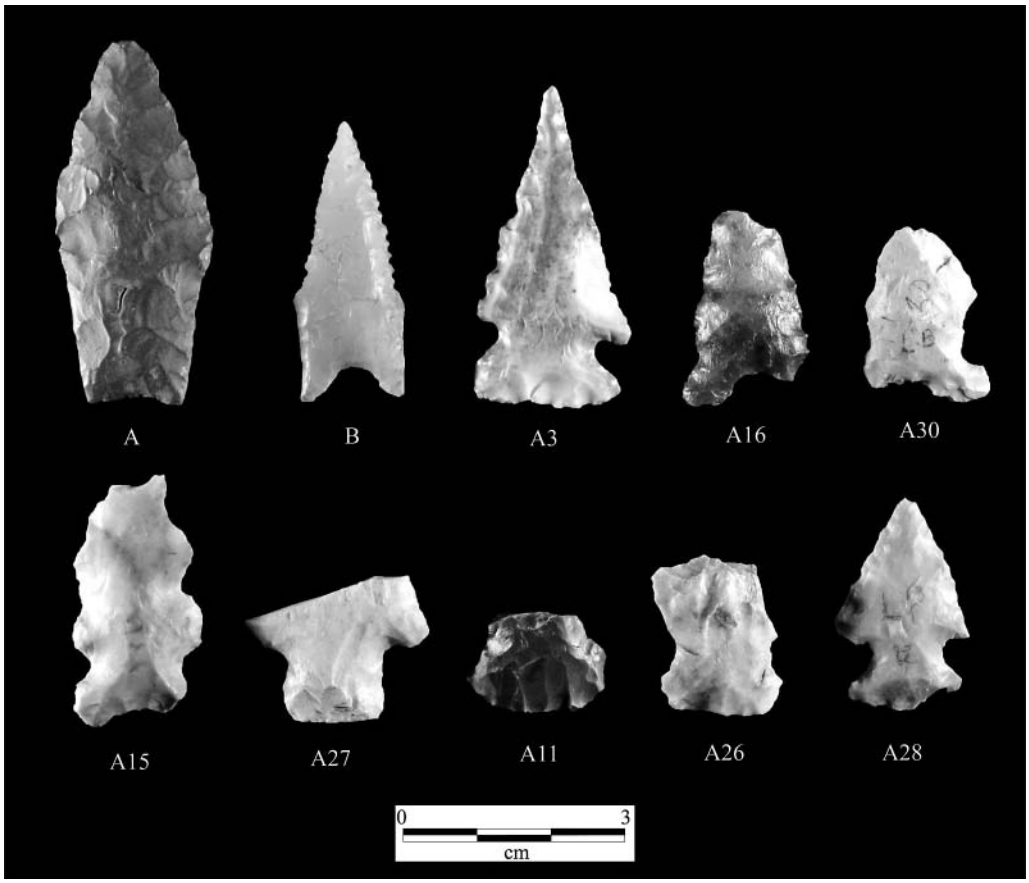


Figure 34. Surface-collected dart points from Site 41BS810. Photo: E. Blecha.

Specimen A26 (Fig. 34): Made from the same toolstone as specimen A15, this specimen is also side notched; however, the side notches are much wider. The basal edge is straight with rounded corners. The lateral blade edges are missing; however, the distal tip appears to be reworked into a graver.

Specimen A28 (Fig. 34): Although complete, this specimen remains untypable due to its small size. It has deep U-shaped side notches and a wide-necked expanding stem with a convex basal edge. The small blade element has straight lateral edges. This specimen is lenticular in cross section and manufactured from a light-to-medium gray mottled chert flake.

Cliffton Arrow Point (1 specimen)

Specimen A19 (Fig. 35): This is a proximal fragment of a Cliffton arrow point. It has a wide blade and down-sloping shoulder that contracts to a point. Plano-convex in cross section, this specimen is bifacially worked from a black chert flake or blade.

Livermore Arrow Points (2 specimens)

Specimen A14 (Fig. 35): This Livermore arrow point has concave and extremely serrated lateral blade edges. The small barbs extend from the stem at a 90-degree angle. The specimen is relatively thick and manufactured from a mottled yellow and red chert flake. The stem and distal tip are missing.

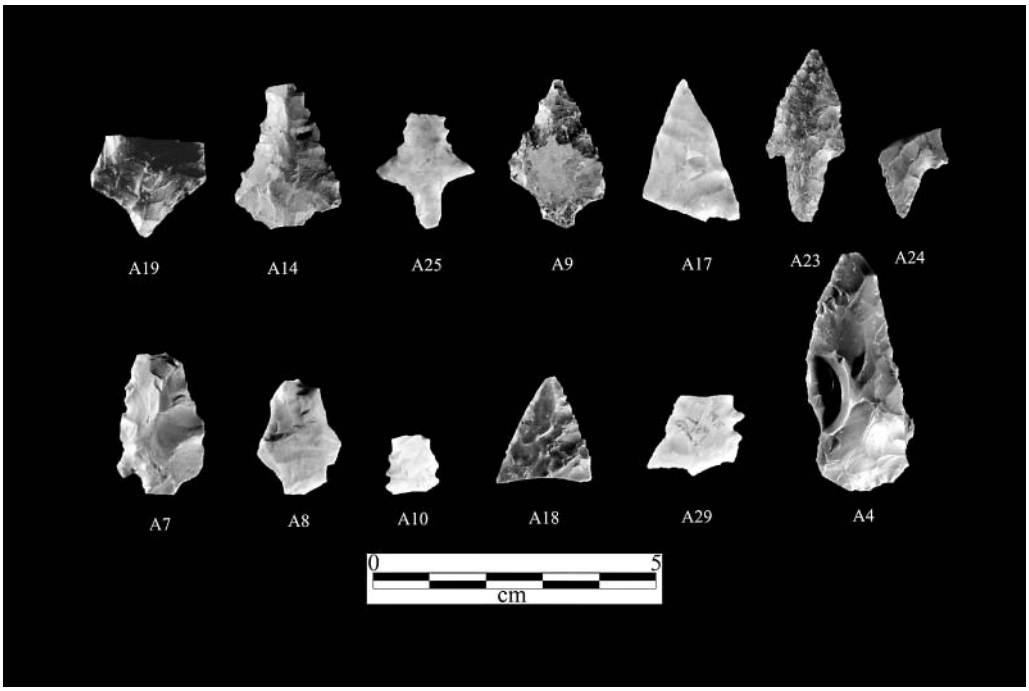


Figure 35. Surface-collected arrow points and arrow preform from Site 41BS810. Photo: E. Blecha.

Specimen A25 (Fig. 35): Specimen A25 is an extremely well-made Livermore arrow point with a narrow, strongly serrated blade element and large V-shaped laterally extending barbs. The slightly contracting stem has a convex basal edge and the distal blade tip is missing. The specimen is made from light gray chert.

Perdiz Arrow Points (4 specimens)

Specimen A9 (Fig. 35): This Perdiz arrow point is missing two barbs and a portion of the stem. Manufactured from a dark maroon and brown blade or flake, this specimen has reworked convex blade edges.

Specimen A17 (Fig. 35): This specimen consists of the blade element and one moderate barb. Made from a light gray chert flake, this specimen is thin and has been minimally worked on the ventral face—only on the distal tip. The blade element is large with straight lateral edges.

Specimen A23 (Fig. 35): This specimen is complete and plano-convex in cross section. The stem is long and contracting with a convex basal edge. The barbs are small, and one has been reworked into a shoulder. The blade edges are slightly convex and exhibit unifacial beveling. The ventral face is only minimally worked—around the corner notching. The specimen is made from dark gray chert.

Specimen A24 (Fig. 35): The proximal fragment of a Perdiz arrow point, this specimen has a stem that contracts to a point. The shoulder that remains is strong and pointed. The specimen is made from yellowish-brown jasper and is bifacially worked.

Untyped Arrow Points (5 specimens)

Specimen A7 (Fig. 35): This arrow point is likely a Perdiz but it lacks the diagnostic stem. This specimen is corner notched with one small barb and one rounded shoulder. The lateral blade edges are moderately sinuous and convex. The specimen is made from dark yellow jasper and is minimally worked around the corner notches on its ventral surface.

Specimen A8 (Fig. 35): Extremely fragmented, this arrow point midsection has no discernible margins or distinctive features. Made from gray chert, the fragment is thin and bifacially worked.

Specimen A10 (Fig. 35): The midsection of an extremely serrated and narrow blade, Specimen A10 is bifacially worked and well made. The toolsone is white chert.

Specimen A18 (Fig. 35): The distal blade of an arrow point, this specimen is thin and well worked on both faces. The lateral blade edges are straight to slightly convex. The specimen is made from a dark brown chert flake or blade.

Specimen A29 (Fig. 35): Specimen A29 is probably the midsection of a Livermore arrow point. What remains of the specimen is one V-shaped laterally extending barb and a portion of the lateral blade edges. One blade edge is extremely serrated while the

other lacks serrations. The specimen is bifacially worked and manufactured from a light gray chert blade or flake.

Arrow Preform (1 specimen)

Specimen A4 (Fig. 35): This is an arrow point preform with wide convex basal edges, shallow side notches, and slight shoulders. The specimen has one straight blade edge and one convex. Two large "knots" are on either face of the specimen—one is in the low center of the blade element and the other is a piece of cortex close to the blade edge. The specimen is made from yellowish-brown jasper.

Knives (3 specimens)

Grab Bag Specimen C (Fig. 36): Manufactured from mottled dark olive green and black jasper, this is the distal fragment of a beveled knife. The specimen is minimally worked on the ventral face and exhibits unifacial beveling. Use-wear is present in the form of polish on one distal margin.

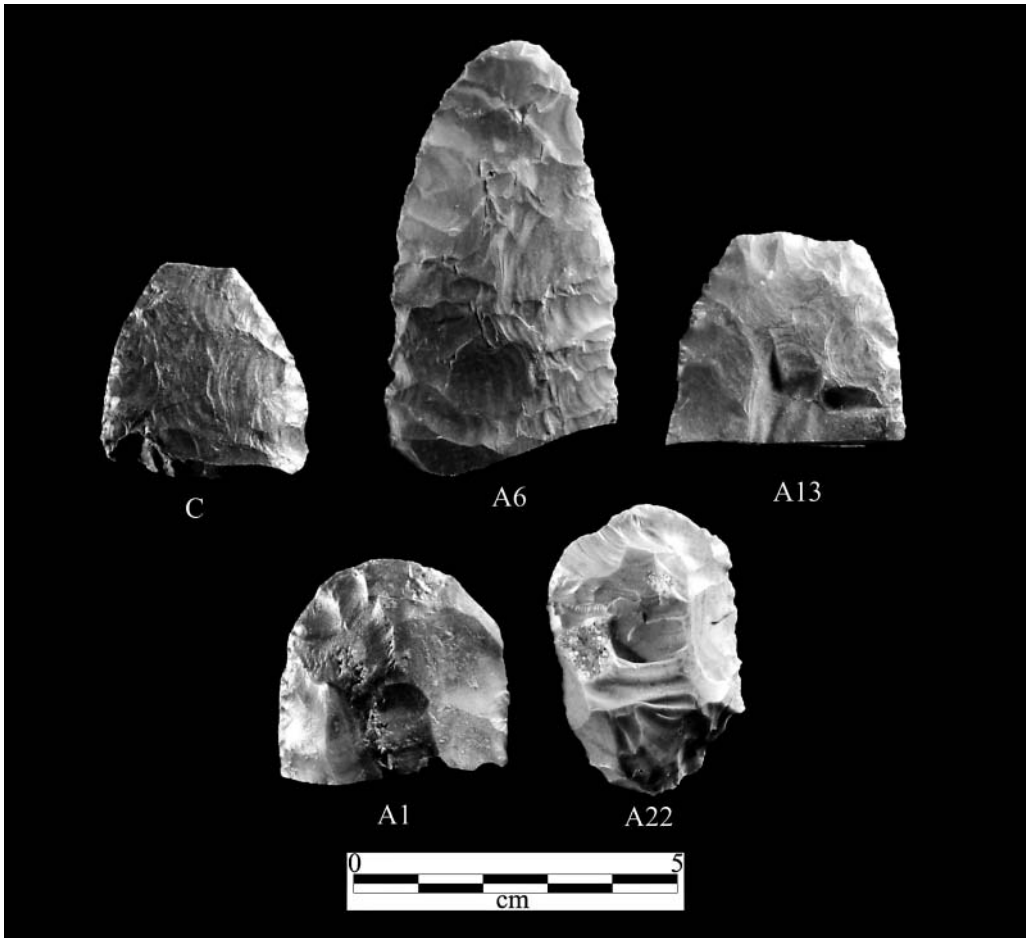


Figure 36. Surface-collected knives and bifaces from Site 41BS810. Photo: E. Blecha.

Specimen A6 (Fig. 36): This specimen is the distal and medial portion of a thin bifacial knife. The specimen has convex lateral edges that narrow towards a convex distal end. It is manufactured from dark gray chert and is well made.

Specimen A13 (Fig. 36): This bifacial knife is roughly the same width and thickness as specimen A6, though more fragmented. Made of red and yellow banded chert, this specimen has slightly convex lateral edges that narrow to a straight basal edge—the distal end is missing. This biface also exhibits use-wear along the blade margins.

Thin Biface (1 specimen)

Specimen A1 (Fig. 36): This is the distal fragment of a long, ovate, thin biface with a convex distal end and straight lateral edges. The specimen is thinned along the face and the side edges into the rounded distal end and exhibits use-wear. The toolstone is yellow and brown mottled silicified wood.

Thick Biface (1 specimen)

Specimen A22 (Fig. 37): This thick biface is small and oval shaped. The specimen exhibits use-wear and reworking along its distal edges and is made from yellow and orange mottled chert with tiny crystalline inclusions in its dorsal surface.

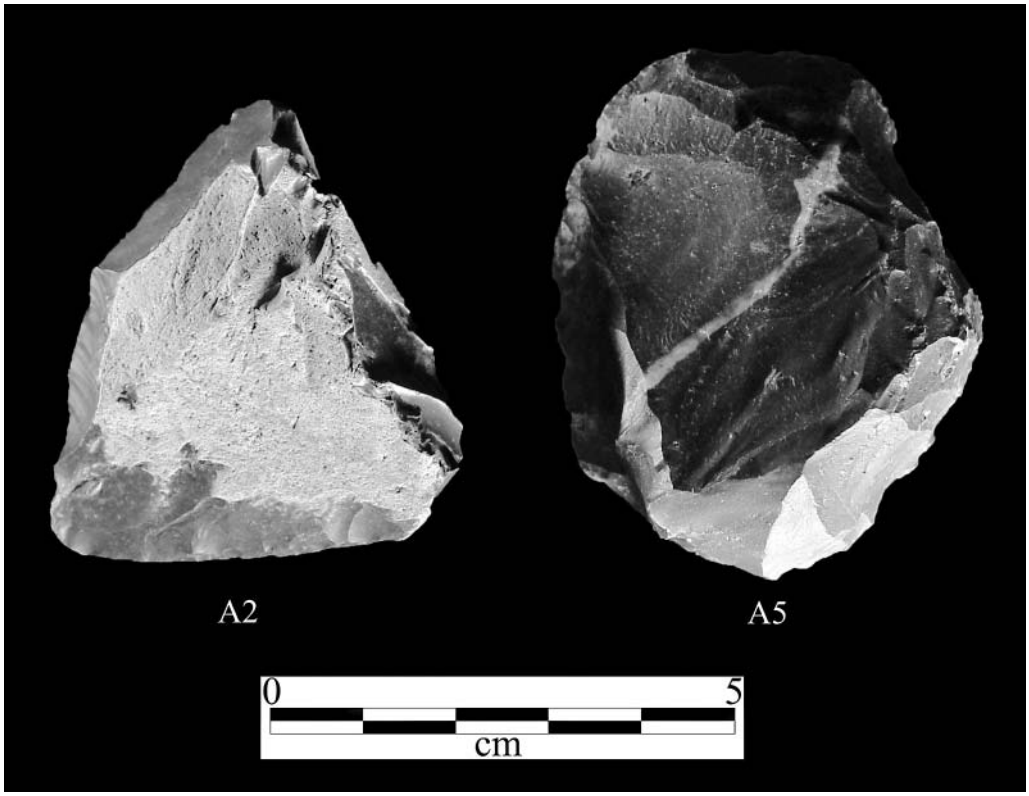


Figure 37. Surface-collected scrapers from Site 41BS810. Photo: E. Blecha.

End Scraper (1 specimen)

Specimen A2 (Fig. 37): This ovate-to-circular dome-shaped end scraper is manufactured from black chert with a strip of white chalcedony through the middle. The distal end and lateral sides are beveled to give the margins a sharp but sturdy edge.

Scraper (1 specimen)

Specimen A5 (Fig. 37): This scraper is triangular shaped with cortex covering the dorsal face except where the specimen is modified along the margins. Made of black chert, this specimen is worked along two of its three margins to create a dome-like profile. It is also worked on the ventral surface.

Utilized Flakes (3 specimens)

Specimen A20: This utilized flake was manufactured from a yellow and brown mottled chert. The specimen is "kidney-bean" shaped, with one extremely convex, worked lateral edge. The opposite edge is slightly concave. The striking platform is small and prepared, and the dorsal face is thinned.

Specimen A21: Specimen A21 is a rectangular silicified wood flake with a hinge termination that exhibits use-wear along all margins. The striking platform is not discernible.

Specimen A30: This utilized flake or blade has a prepared small platform. The specimen is thin and broken in the middle, and all edges exhibit use-wear. The specimen has been heat treated as evinced by a small pot-lid near the fracture.

Flakes (2 specimens)

These two grab bag flakes are both fragmented. One is made of banded yellowish-brown, dark red, and black chert and is likely a piece of shatter. The other specimen is made of red andesite and is a proximal flake fragment with snapped lateral and distal margins.

Hammerstone (1 specimen)

Specimen A12: This roughly spherical hammerstone, pecked and dulled from use, is made from a red andesite cobble.

Site 41BS811

Site 41BS811 is a multicomponent open prehistoric site located within the relic floodplain ca. 350 m (1,148 ft) west of Calamity Creek (Fig. 38). The site's surface is relatively flat with a very slight slope to the south. The site measures ca. 130 m (427 ft) (E-W) by 240 m (787 ft) (N-S) and is bisected east to west by a power line. The main road into Elephant Mountain WMA is located ca. 30 m (98 ft) south of the site, and an inverted fence line runs north-south from the road just outside the western site boundary. Site boundaries are delineated primarily by the scatter of lithic debitage. The site occupations appear stronger in the eastern-central area of site, but this may be a factor of enhanced aeolian and sheet erosion occurring within subareas of the site.

Due to the aforementioned erosion, the likelihood of buried cultural components

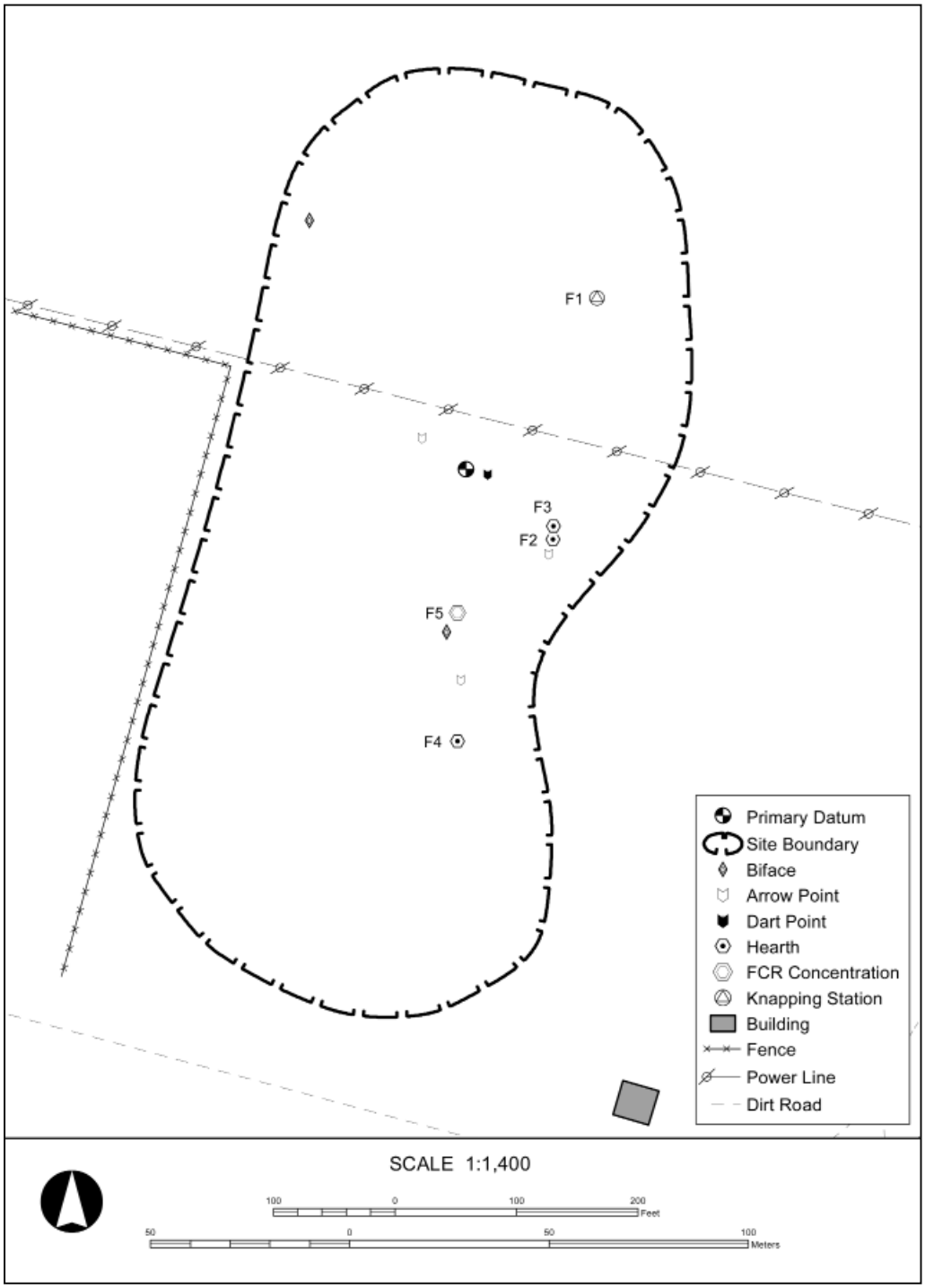


Figure 38. Plan map of Site 41BS811. Drafting E. Blecha.

within the site is low. Elephant Mountain lies to the east of the site. Crossen Mesa is visible to the southwest, and Cathedral Mountain to the northwest. Vegetation observed on the site includes honey mesquite (*Prosopis glandulosa*), tarbush (*Flourensia cernua*), four-winged saltbush (*Atriplex canescens*), Russian thistle (*Salsola tragus*), Green condalia (*Condalia viridis*), prickly pear (*Opuntia* sp.), and various desert bunch grasses.

Fieldwork

On June 17, 1996, Site 41BS811 was mapped and surface-collected by the SRSU field school participants. A primary datum was established roughly in the center of the site, and a theodolite was used to map the cultural and noncultural features. All observed surface artifacts at this site were instrument-plotted, along with five features that were measured and described.

Feature

A total of five features (Table 6) were observed within Site 41BS811. Feature 1 is a lithic workstation comprised of a single reduction episode of a yellow-brown chalcedony core, concentrated within a 5-m (16-ft) area. Three features, F2 through F4, are small hearths aligned approximately north to south along the eastern edge of the site south of the power line. All are stone ring hearths that tend to be open in the center, circular to sub-circular in shape, and partially intact. They average 55 cm (22 in) in diameter and are constructed of small igneous stones with apparent thermal fracturing. The fifth feature, F5, is a fire-cracked rock scatter that is likely a highly disturbed hearth and is spread across a 2-m (7-ft) area.

Artifacts

Six formal and temporally diagnostic artifacts, along with 40 pieces of chalcedony debitage from the lithic workstation feature (F1), were documented and recovered from Site 41BS811. Collected artifacts include an untyped dart point (n=1), Perdiz arrow points (n=2), an untyped arrow point fragment (n=1), and a thin and a thick biface (n=2) (Table 7; Fig. 39). These artifacts tend to be in the near vicinity of thermal features within the site and are described in detail below.

The debitage tends to be small and tertiary and consists largely of variegated chert,

Table 6: Surface features at Site 41BS811

Feature #	Type	Shape	Dimensions (cm)	Condition	% of Intactness
1	Lithic Workstation	Circular	500	Scattered	n/a
2	Hearth	Circular	55	Partially Intact	70
3	Hearth	Oval	56	Partially Intact	30
4	Hearth	Sub-circular	55	Partially Intact	50
5	FCR Concentration	Sub-circular	220	Scattered	10

n/a = not addressed in field notes

Table 7: Recorded and collected artifacts at Site 41BS811

Spec No.	Type	Description	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
1	Thick Biface	Cortex Present	Chert	43.9	25.7	8.4	n/a
2	Untyped Dart Point	Missing Distal Tip; Diminutive	Chert	n/a	n/a	6.2	10.4
3	Untyped Arrow Point	Distal Fragment	Chert	n/a	11.7	2.4	n/a
4	Perdiz Arrow Point	Complete	Chert	19.5	14.1	2.6	6.3
5	Thin Biface	Fragment	Chert	n/a	28.1	4.4	n/a
6	Perdiz Arrow Point	Missing Stem	Chert	n/a	10.9	2.4	5.4

n/a = not addressed in field notes.

chalcedony, and silicified wood. To the northeast of the site is a lithic workstation consisting of a chalcedony core and associated debitage. Debitage is also clustered in the east-central and eastern portions of the site in the general vicinity of hearth features. As noted earlier, a lithic workstation consisting of a chalcedony core and associated debitage was recovered in the northeastern area of the site.

Based on recovered diagnostic artifacts, Site 41BS811 has multiple cultural components related to Late Archaic (ca. 1000 B.C.–A.D. 700) and Late Prehistoric (ca. A.D. 700–1535) periods.

Untyped Dart Point (1 specimen)

Specimen A2 (Fig. 39): Made from pink chert, this diminutive dart point is side notched with an expanding stem and a convex basal edge. The distal blade tip and one shoulder are missing. Remaining blade edges appear to be convex and the shoulder is strong.

Perdiz Arrow Points (2 specimens)

Specimen A4 (Fig. 39): This bifacial specimen has a contracting stem with pointed barbs and straight, slightly serrated lateral blade edges. The basal edge is convex. The specimen was manufactured from a light and medium gray chert flake or blade and is missing the extreme distal tip.

Specimen A6 (Fig. 39): Morphologically similar to Specimen A4, this specimen is missing its pointed barbs and the basal edge of the expanding stem. It has straight and lightly serrated lateral edges. Manufactured on a dark bluish-gray chert flake or blade, this specimen is bifacially worked.

Arrow Point Fragment (1 specimen)

Specimen A3 (Fig. 39): The medial blade fragment of an arrow point, this specimen has one convex lateral blade edge and one serrated straight blade edge. The specimen is bifacially worked and made from a dark red chert flake or blade.

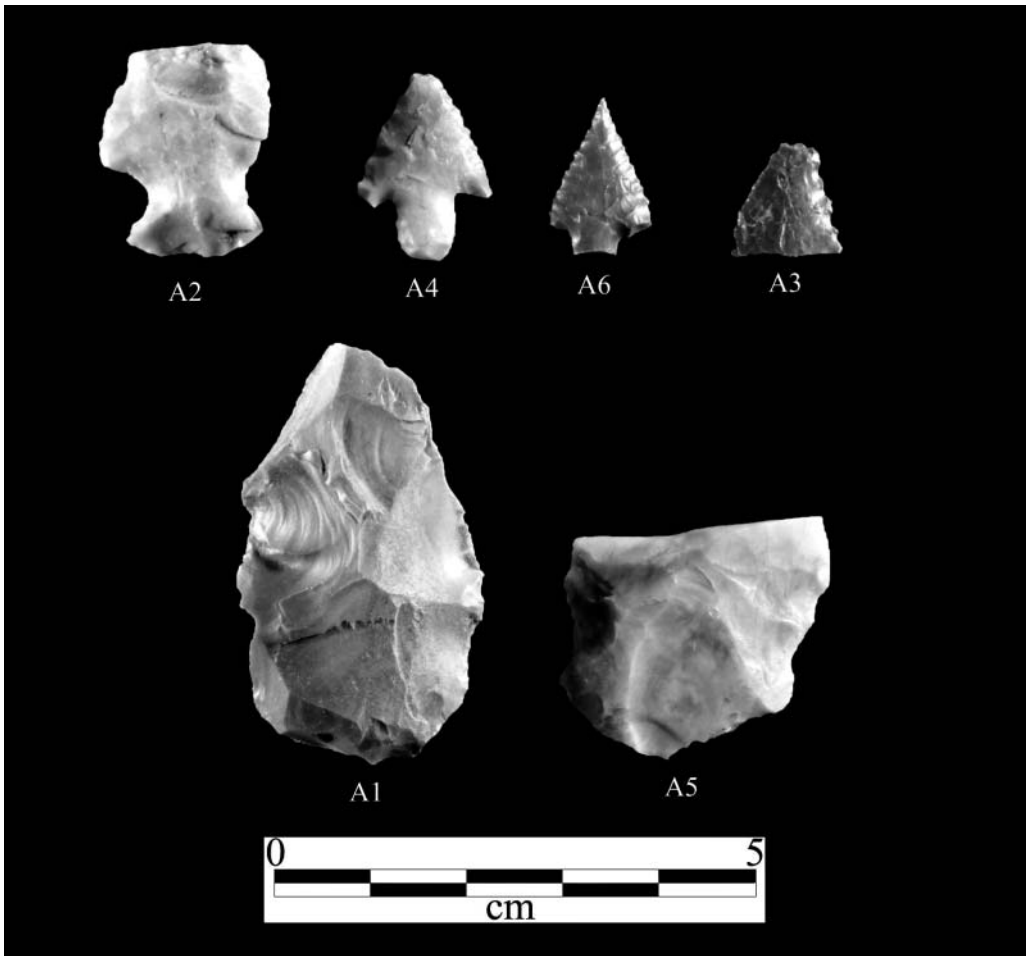


Figure 39. Surface-collected projectile points and other bifaces from Site 41BS811. Photo: E. Blecha.

Thick Biface (1 specimen)

Specimen A1 (Fig. 39): This is a small, thick (8.4 mm [.3 in]), leaf-shaped and pointed-ovate biface. Made of pink, gray, and tan mottled chert, this specimen has cortex along the distal blade edge. Both lateral blade edges are convex, as is the basal edge.

Thin Biface (1 specimen)

Specimen A5 (Fig. 39): Specimen A5 is the distal fragment of a bifacially worked tool. This specimen is thinner than specimen A5 (4.4 mm [.17 in]), with a convex and wide distal end. One lateral edge is convex while the other is straight and slightly contracting with a shallow concave indent. The specimen is made from blue and gray mottled chert.

Site 41BS814

Site 41BS814 is a deeply buried open prehistoric site in a high alluvial cutbank of Calamity Creek (west side) that was recorded by Mike Davis and Virginia Wulfkuhle in 1988 while conducting a reconnaissance for TPWD. Located a short distance upstream from a low-water crossing north of the WMA headquarters, this bluff face site was relocated and investigated by the SRSU field school team on June 3–5, 1996.

In 1988, Davis and Wulfkuhle (Center for Big Bend Studies n.d., documentation on file) discussed their finding of a large metate (40 x 32 x 8 cm [16 x 13 x 3 in]) buried deep in the cutbank, roughly 30 m (98 ft) upstream from the northernmost extent of a buried cultural lens. The metate was 1.5 m (5 ft) below the surface and lying work-surface down with a layer of charcoal underneath and two large burned rocks on top. They collected a charcoal sample and extracted the metate. During their visit, Davis and Wulfkuhle noted cultural strata in the bluff, as well as a series of very thin gray lenses containing carbonized plant material that might have resulted from ancient grass fires.

Detailed examination of the vertical bluff by the field school participants in 1996 revealed strong similarities of the tan alluvial stratigraphy here with that of the Sheep Creek (41BS36) and Calamity Creek (41BS35) site localities downstream in the more central area of the WMA. All three localities are characterized by vertical exposures several meters thick of both upper and lower Calamity formation alluvium. In 1996, the 4-m (13-ft) cutbank at Site 41BS814 exhibited evidence of at least two paleosols—an upper and a lower—both containing prehistoric cultural components with thermal features.

All strata in the bluff face dip from north to south (Fig. 40). The upper paleosol (Z-1), which constitutes the uppermost stratum in the bluff, is dissected by erosion and is missing along a significant portion of the bluff face. Moving northward, however, Z-1 reappears and can be traced out across much of the remaining bluff face where it contains

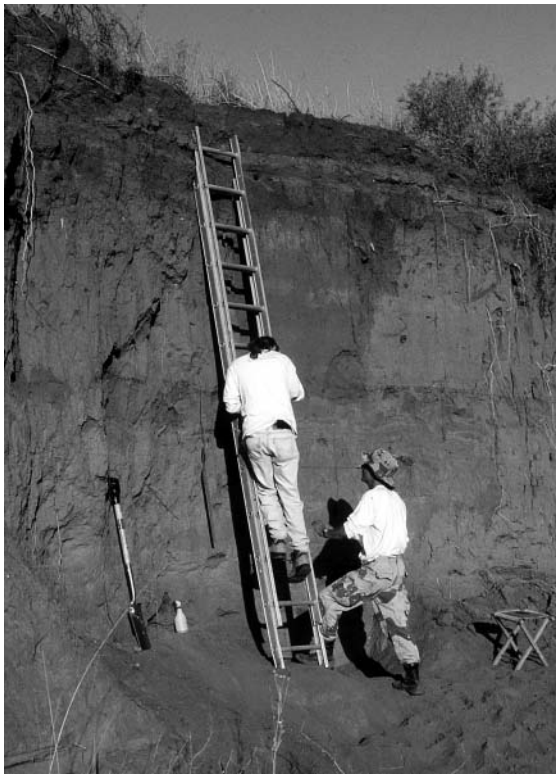


Figure 40. Preparing cutbank face for profiling at Site 41BS814. Photo: R. Mallouf.

thinly scattered cultural debris as well as a hearth feature (F2).

The lower paleosol is somewhat segmented but fairly well defined by its grayish hue and constitutes a lower soil zone (Z-8) naturally exposed at the site. Located within this zone at a depth of ca. 4.7 m (15.4 ft) is a second thermal feature (F1) and thinly scattered cultural material. Close by this lower thermal feature, but at a higher elevation, are a series of very thin, parallel, superimposed lenses (Z-3) of carbonized vegetal matter having characteristics of freshwater reeds or similar plants that might be expected to occur along the edges of a marsh or pond (Fig. 41). As was previously suggested by Davis and Wulfkuhle (Center for Big Bend Studies n.d., document on file), these lenses are thought to be traces of prairie fires that repeatedly raced across the site at intervals over a long period of time. The lower paleosol is traceable along the base of the vertical bluff for a distance of ca. 8.5 m (28 ft), and it is highly likely that additional deeply buried features are present in the zone. Immediately downstream from 41BS814, the soil sequence is truncated and replaced by thick channel-fill gravels.

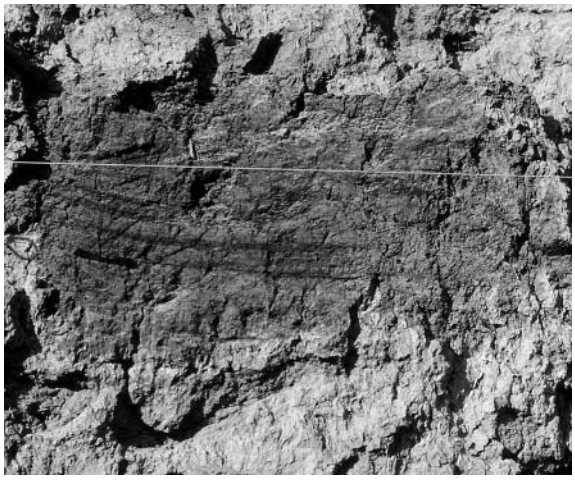


Figure 41. Series of thin, superimposed carbon lenses deep in cutbank, Site 41BS814. Photo: R. Mallouf.

Fieldwork

Fieldwork at Site 41BS814 was carried out by the field school over a period of three days and was restricted to detailed profiling of the bluff face and recording the erosionally exposed cultural content. After initial examination, two locations on the bluff, separated by a distance of 35 m (115 ft), were selected for detailed profiling. Using a sliding aluminum ladder to access the higher section of the cutbank, two 1-m-wide (3-ft) sections were cut and scraped from the top leading edge down to its contact with the arroyo floor.

Cutbank Profile (CBP) 1 was placed 10 m (33 ft) upstream from thermal Feature 1, which was exposed in the lower unit of the Calamity formation sediments. The upstream placement was due to an overhanging bluff configuration and attendant mesquite root systems that made ladder access to the bluff face impossible at the feature location itself. The profiling team was able to discern 10 alluvial soil zones (Zone 1 through 10, in descending order) in CBP-1. The top ca 30 cm (12 in) of this soil sequence (Zone 1) was found to correspond to the Kokernot (recent) formation as originally defined by Albritton and Bryan (1939), while Zones 2 through 10 constitute variable cut-and-fill

episodes of the Calamity (Holocene) formation. The series of superimposed thin lenses of carbonized plant material discussed above occurs only in Zone 3 of CBP-1 and are not present in CBP-2.

Feature 1, which was exposed in Zone 8 of the lower cutbank, was drawn to scale and its matrix sampled for radiocarbon and matrix analysis. Thermal Feature 2 was located 19 m (62 ft) upstream from CBP-2, high on the bluff some 30 cm (12 in) below the terrace edge in Zone 3, but it was inaccessible by ladder for purposes of a scale drawing, although a radiocarbon and matrix sample was obtained from the feature via safe access from the top of the terrace.

Spots of orange-colored sediments in the cutbank might have origins in outcropping yellow Cretaceous-age limestone a short distance upstream. It was speculated, but not demonstrated, that lime-coated gravels eroding out of the base of the bluff might be related to the underlying Neville (Pleistocene) formation.

Soil Zones 1, 2, and 10 were only present in CBP-1. A few meters upstream these zones are truncated by sheet erosion at contact with the terrace surface. Cultural content in CBP-1 is mainly confined to Z-3 and Z-8, although sparsely scattered debitage and pieces of burned rock have a spotted occurrence in other strata as well.

As noted earlier, CBP-2 was placed 35 m (115 ft) upstream from CBP-1 where a second thermal feature had been discovered near the top of the cutbank, and the same location where a metate and charcoal samples were taken by Davis and Wulfkuhle in 1988. Soil Zones 1 and 2 were missing at this location, and the sequence begins with Zone 3 and ends with Zone 9 (Zone 10 runs underground at this location). The bluff face here was 4.4 m (14.4 ft) high, and most of the soil zones delineated here could be correlated with those at CBP-1 (Fig. 42).

All soil zones, lenses, and other content were delineated and described in detail during the fieldwork and training sessions performed at Site 41BS814. As is the case across much of the Calamity Creek basin, most of the largely homogeneous alluvial strata (Straddlebug soil series) are derived from Duff and Pruitt formation tuffs, which gives the sediments their ubiquitous light tan coloration. The two cutbank profiles have been integrated below in Table 8 to provide a simplified stratigraphic overview of Site 41BS814.

Features

The two thermal features discovered in the cutbank at 41BS814 both exhibited shallow basin-shaped pit outlines with ashy matrices of fragmented burned rock and bits of charcoal. Feature 1, the larger of the two, was embedded in Zone 8 at 10 m (33 ft) downstream from CBP-1. A charcoal sample recovered from this feature yielded a radiocarbon assay of cal. 3631–3037 B.C. (cal. 5580–4986 yrs. B.P.), or toward the latter end of the Early Archaic period in the Big Bend region.

As noted earlier, and in contrast to Feature 1, Feature 2 was located high on the bluff in Zone 3. A charcoal sample obtained from the feature returned an assay of cal. A.D. 1443–1644 (cal. 507–315 B.P.), indicating occupation very late in prehistory or

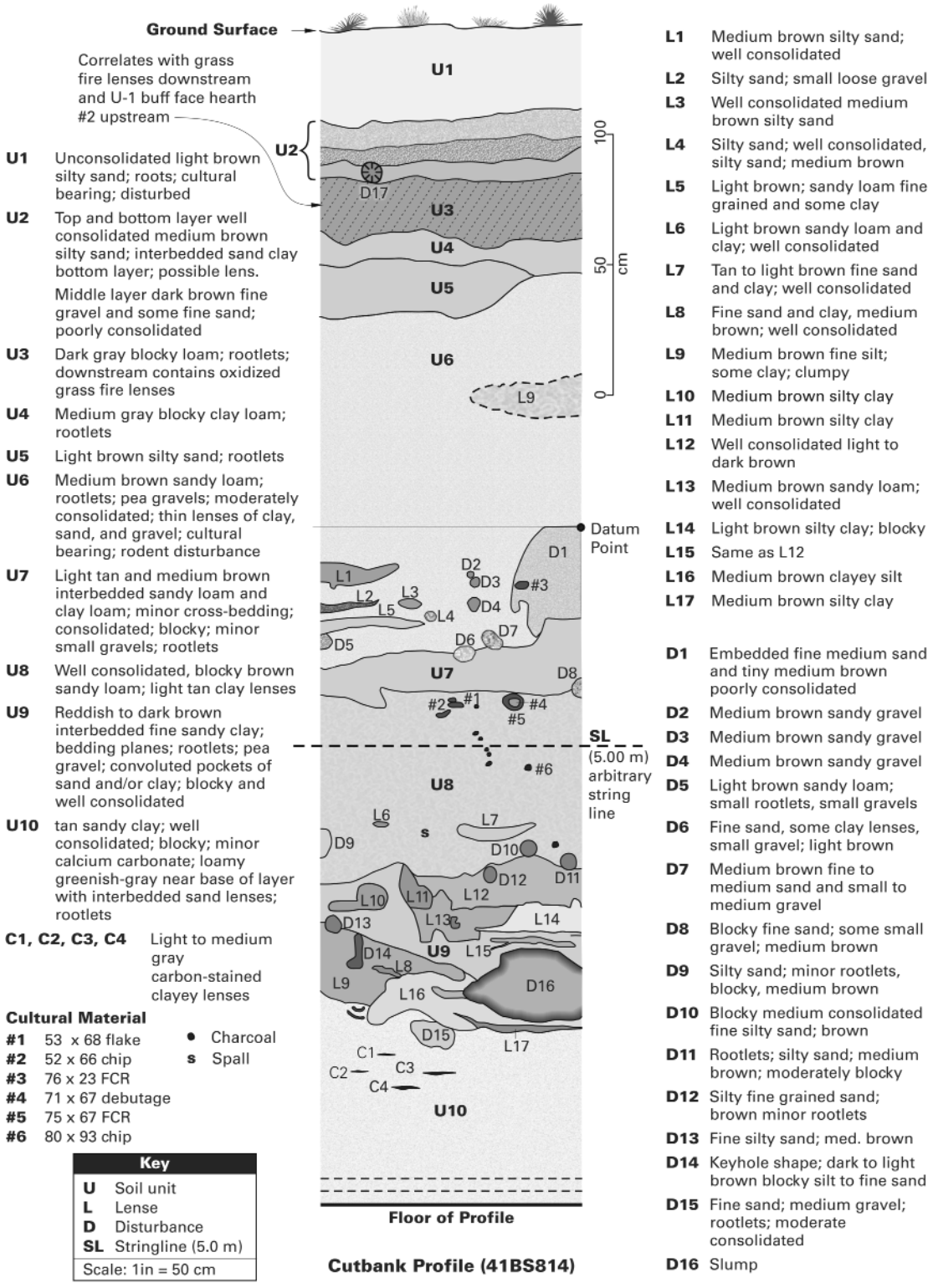


Figure 42. Cutbank Profile 2 at Site 41BS814. Drafting: L. Wetterauer.

Table 8: Stratigraphic overview of Cutbank Profiles 1 and 2 at Site 41BS814

Zone	Description	Layer Thickness (cmbs)	CBP-1 Cultural Materials	CBP-2 Cultural Materials
1	Dark brown, poorly consolidated, fine gravel and sand	CBP-1: S–30 CBP-2: NP	None	None
2	Three layers—Top and bottom layer well consolidated, medium brown, interbedded silty sand and clay; middle layer dark brown, poorly consolidated fine gravel and sand	CBP-1: 30–55 CBP-2: NP	None	None
3	Blocky, dark gray loam; Hearth 2	CBP-1: 55–80 CBP-2: S–55	None	None
4	Medium gray, blocky clay and clay loam with small rootlets	CBP-1: 80–92 CBP-2: 55–95	None	None
5	CBP-1: Light brown, vesicular clay loam with some silt and small rootlets; CBP-2: Blocky clay loam with scattered calcium carbonate	CBP-1: 82–112 CBP-2: 95–155	None	None
6	Medium brown sandy loam, with rootlets, small gravel, fairly well consolidated clay and sand gravel lenses. CBP-2 also had scattered pieces of charcoal	CBP-1: 112–242 CBP-2: 155–270	220 cmbs: FCR in disturbed area (A3)	162 cmbs: FCR 168 cmbs: Charcoal collected
7	Light tan to medium brown interbedded sandy loam and clay loam with minor crossbedding. Well consolidated and blocky with minor small gravel or coarse sand. Rootlets and root molds are present.	CBP-1: 242–260 CBP-2: 270–320	255 cmbs: FCR (A5)	None
8	Well consolidated, blocky, brown, sandy loam, light tan clay lenses with numerous charcoal deposits, small snails, rootlets throughout (correlation with bluff face Hearth 1)	CBP-1: 260–325 CBP-2: 320–370	260 cmbs: Flake (A2) 262 cmbs: Hammerstone (A4) 268 cmbs: Flake (A1) 285 cmbs: Flake (A6)	None
9	Interbedded fine sand and clay, reddish-tan to darker brown, some bedding planes, rootlets, small gravel, convoluted pockets of consolidated sand and blocky clay	CBP-1: 325–390 CBP-2: 370–420	None	400 cmbs: FCR laying horizontally (4 x 8 cm) 408 cmbs: Faunal 410 cmbs: Charcoal in intact portion of layer
10	Sandy, moist, consolidated, blocky clay with calcium carbonate and a reduced greenish-gray clay layer near the base. Sand lenses are interbedded throughout and rootlets	CBP-1: 390–445 CBP-2: NP	None	None

*NP = Not Present; S = Surface

during the early Contact period. Two bulk carbon samples consisting of superimposed carbonized plant leaves taken from Zone 3 were, for fiscal reasons, not submitted for dating.

Artifacts

Six artifacts were collected from the site, all of which were found in CBP-1 during its preparation for profiling. The artifacts and the depths below surface at which they were discovered are as follows: two fire-cracked rock fragments (A3, 220 cmbs; A5, 255 cmbs), three flakes (A1, 268 cmbs; A2, 260 cmbs; A6, 285 cmbs), and one hammerstone (A4, 262 cmbs). The artifacts are described in more detail below (Table 9).

Observed in CBP-2 was a piece of charcoal and burned rock in Zones 6 and 9, as well as a flat-laying piece of FCR in Zone 9. A mammal tooth was collected from Zone 9 of CBP-2 (Special Sample 1). For additional information on the matrices represented and the depths of cultural materials located in CBP-1 and CBP-2, see Table 8.

Flakes (3 specimens)

Specimen A1, A2, and A6: Specimen A1 is a large, black hornfels flake with a concave termination. Specimen A2 is a smaller piece of reddish-black hornfels angular shatter. The smallest of the flakes is Specimen A6, which is a thin medial red chert flake fragment.

Hammerstone (1 specimen)

Specimen A4: Made from red andesite, this is a highly fragmented piece of a hammerstone. The specimen is thick (26.9 mm [1.06 in]) and roughly dome shaped. The distal end is crushed, suggesting its use as a hammer.

Fire Cracked Rock (2 specimens)

Specimen A3 and A5: These two specimens are fragments of fire-cracked brown rhyolite cobbles.

Table 9: Cultural materials observed and/or recovered at Site 41BS814

Spec No.	Type	Description	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)
1	Flake	Complete	Hornfels	52.9	51.1	19.7
2	Flake	Angular Shatter	Hornfels	25	22.7	7.9
3	Fire-cracked Rock	n/a	Andesite	57.8	39.9	38.5
4	Hammerstone	Fragmented	Andesite	47.9	47.2	26.9
5	Fire-cracked Rock	n/a	Rhyolite?	80.2	46.2	41.1
6	Flake	Fragment	Chert	17.9	10.6	2.4

n/a = not addressed in field notes

Hackberry Motte Site (41BS1104)

The Hackberry Motte site (41BS1104) was discovered by CBBS archaeologist William A. Cloud (1996) while conducting a cultural resources survey on a proposed primitive campground within Elephant Mountain WMA. The site (Fig. 43) was recorded and subsequently test excavated by the SRSU archaeological field school on May 29–31, 1996. This is an open prehistoric site at the northwest corner of the WMA on a well-elevated terrace forming the east bank of Calamity Creek. The amorphously shaped site, measuring approximately 520 m (1,706 ft) (NW-SE) x 220 m (722 ft) (NE-SW), is adjacent to a 90-degree meander bend in the creek.

Calamity Creek forms the site boundary in the area of the meander bend. The northern boundary is about 80 m (262 ft) north of the meander bend, while the eastern boundary is 200 m (656 ft) east of the bend. The southeastern boundary is about 400 m (1,312 ft) southeast of the bend. The southwestern boundary is along the high terrace edge which is adjacent to the creek for about 100 m (328 ft) south of the bend before angling away from the creek to the southeast. The site area is crossed by two fence lines and a looped ranch road (now a campsite).

There were a number of indications that this terrace had been cultivated in the past: a) evidence of furrows and possibly two remnants of irrigation canals; b) vegetation indicative of disturbed soil, including broomweed (*Gutierrezia sarothrae*), Russian thistle (*Salsola tragus*), honey mesquite (*Prosopis glandulosa*), algerita (*Mahonia trifoliolata*), sweet acacia (*Acacia farnesiana*), whitebrush (*Aloysia gratissima*), and western hackberry (*Celtis reticulate*); c) the presence of large hackberry trees that were probably left standing when the terrace was originally plowed (probably using draft animals in the 1920s). A portion of the cultural deposit exposed in a shallow blow-out appears to have been plowed through and disturbed in the past.

Terrace deposits are slumping into the creek, and some artifactual material was recorded in these sediments (a worked fossilized astragalus bone, possibly from a bison, was found in the slump). The top of the underlying Calamity formation does contain a buried paleosol; however, the top of the paleosol lies at ca. 20 cm (8 in) below the ground surface.

Fieldwork

The Hackberry Motte site was the first site to be investigated by the SRSU archaeological field school. The main objective of the fieldwork was to assess site content and integrity and to determine whether or not campground construction would adversely affect cultural deposits present in the project zone. The fieldwork conducted on the site began on May 29, 1996, and ended May 31, 1996. The investigation consisted of a pedestrian inspection of the surface, assessment of cutbank profiles (CBP-1 and CBP-2), controlled shovel tests (Shovel Tests 1, 2, and 3), uncontrolled shovel tests (Shovel Tests 4, 5, 6, and 7), and a single controlled 1 x 1 m (3 x 3 ft) excavation unit (Excavation Unit 1). All subsurface recovery was

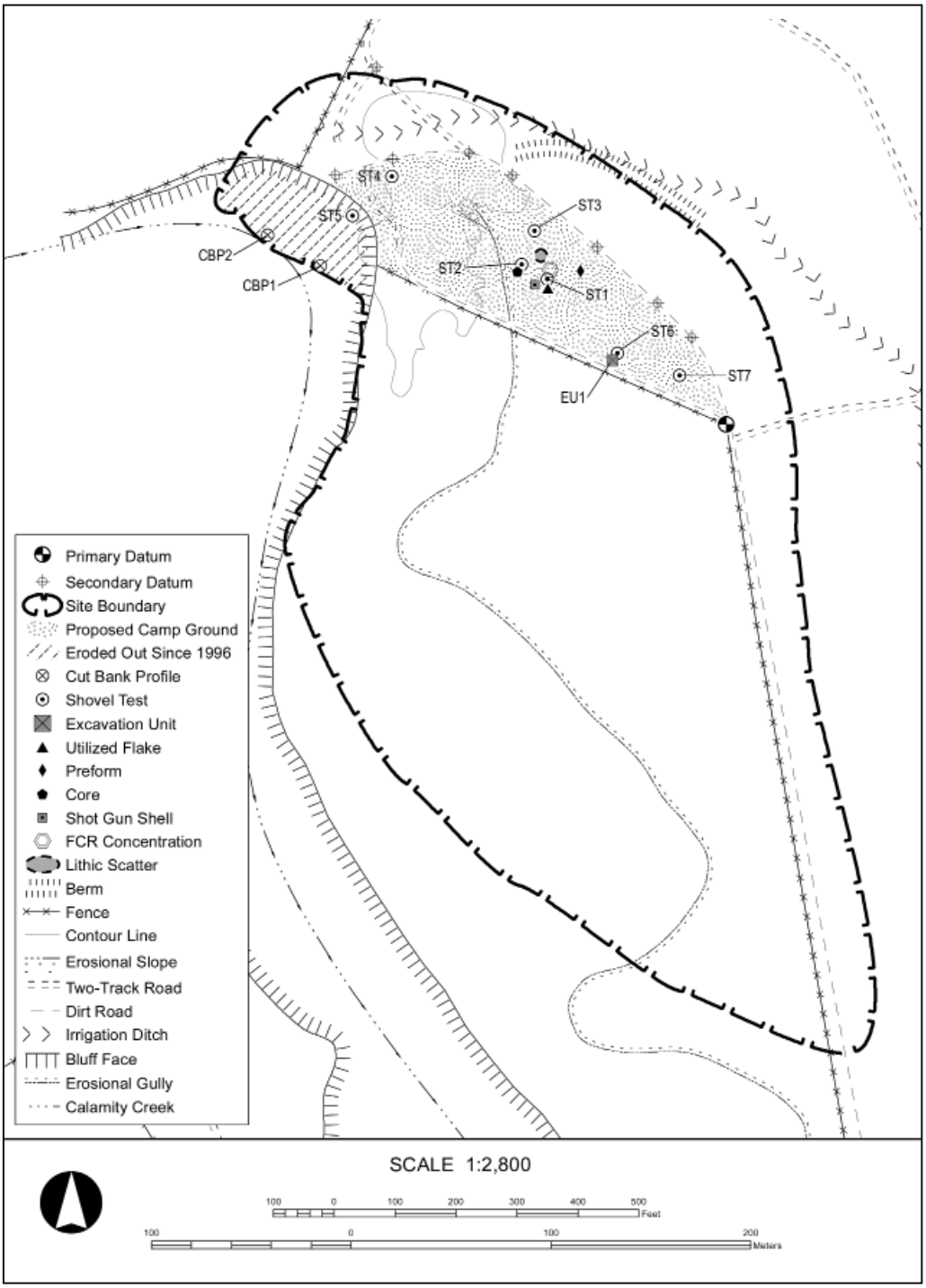


Figure 43. Plan map of the Hackberry Motte site (41BS1104). Drafting E. Blecha

accomplished using one-quarter-inch hardware cloth, and all cultural material recovered from the excavations was collected.

Survey

Pedestrian inspection of the surface was accomplished with nine people who made an initial very tight transect across the area and continued to cross it over a three-day period. A compass and 50-meter tape were used to map the site within the proposed campground area.

The cutbank profiles were initiated to provide insights on the stratigraphic column present in the area adjacent to the proposed campground and to attempt to locate buried cultural components that might lie below the plow zone. They were done along Calamity Creek just west of the meander bend, approximately 30 m (98 ft) from the southwestern edge of the proposed campground. These profiles were concentrated on the upper portion of the eroded cutbank. CBP-1 was 1 m (3 ft) wide and extended to a depth of 103 cm (41 in). CBP-2 was 90 cm (35 in) wide and extended to a depth of ca. 150 cm (59 in) (Fig. 44). Both profiles yielded evidence of the top of a possible paleosol at a depth of ca. 20 cm (8 in) below surface. The uppermost zone (Zone 1), a light brown sandy loam with rootlets, was loosely consolidated and poorly developed.

Controlled Shovel Tests 1, 2, and 3

Controlled shovel tests (ST) were formal 50 x 50 cm (20 x 20 in) units that were excavated in 10-cm (4-in) levels to depths of 40 cm (16 in). These units were placed in upper, middle, and lower elevations of a blow-out area in the central portion of the proposed campground where a minor concentration of cultural material was observed. A few pieces of debitage and fire-cracked rock were recovered from depths of 0–10 cm (0–4 in) at two of the shovel tests. No cultural material was found in ST-3.

Uncontrolled Shovel Tests 4, 5, 6, and 7

The uncontrolled shovel tests were excavated to depths of 50–60 cm (20–24 in). Recovery in these shovel tests was aimed simply at determining the presence or absence of cultural material, so levels were not used. They were placed in the eastern and western subareas of the project zone. Only one of these tests, ST-6, yielded cultural material.

Controlled Excavation Unit 1

One controlled excavation unit (EU-1), measuring 50 cm x 1 m (20 in x 3 ft), was placed adjacent to ST-6 in order to more thoroughly investigate the buried cultural zone identified in that shovel test. The unit was excavated to a depth of 53 cm (21 in). The upper levels in this unit proved to be culturally sterile, but Level 3 (20–30 cm [8–12 in] below the surface) yielded cultural material from a depth of 23–29 cm (9–11 in). Cultural material was not encountered below 29 cm (11 in) in this test unit. This small area of the site seemed to contain a highly localized, shallow, buried cultural deposit that was probably related to deposits to the south toward the nearby creek. The cultural deposit was thin and scattered (Cloud 1996).

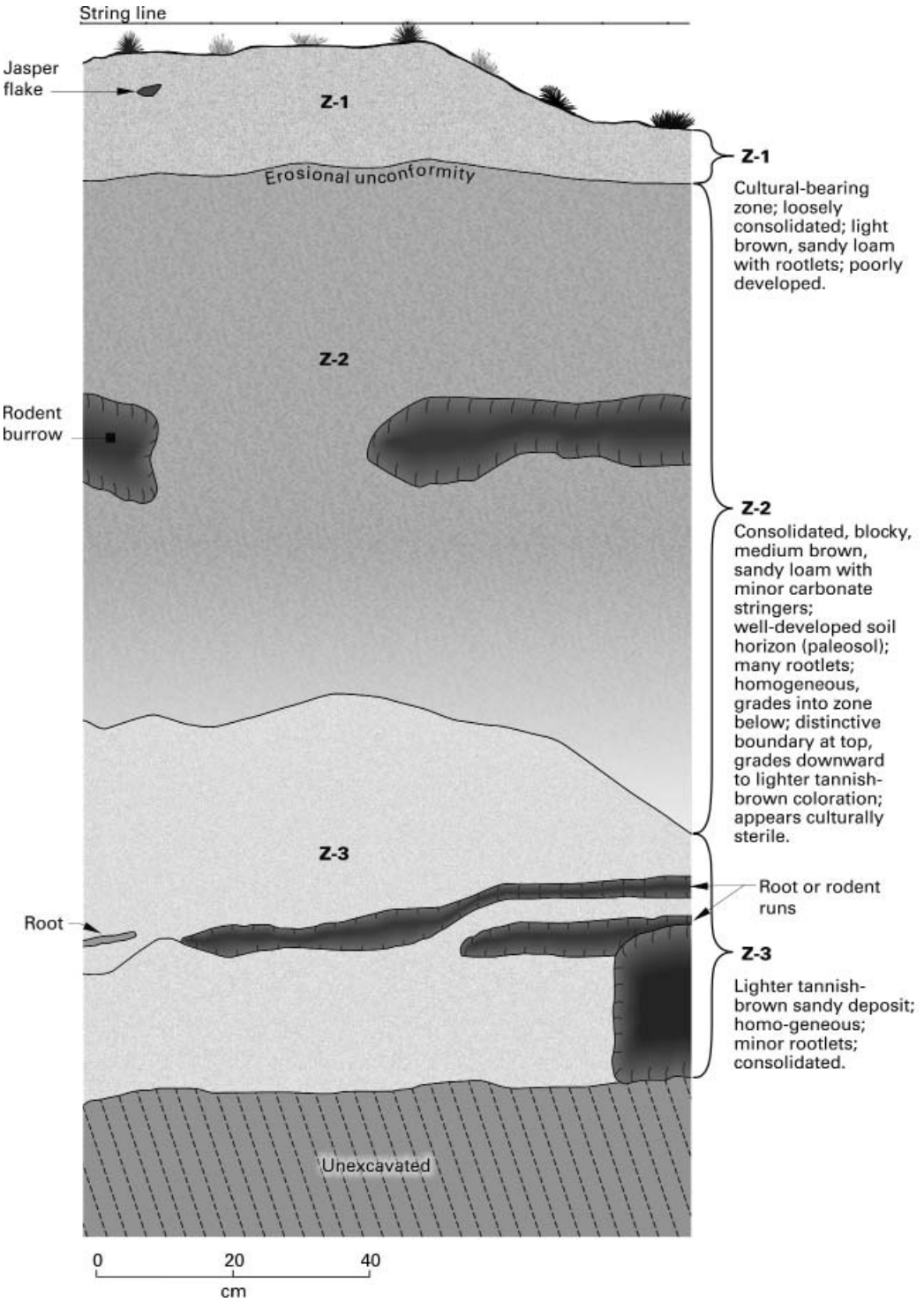


Figure 44. Cutbank Profile 2 at the Hackberry Motte site (41BS1104) on the east side of Calamity Creek. Drafting: L. Wetterauer.

Features

Though there are numerous fire-cracked rocks scattered throughout the site, no cultural features were encountered. Surface and shallowly buried thermal features were likely once present on the site; however, past agricultural pursuits appear to have scattered them across the site.

Artifacts

Only two artifacts were collected from the surface of the Hackberry Motte site: a fossilized astragalus and a contracting stem dart point preform (Fig. 45). Four of the eight excavation units were positive for cultural material (ST-1, ST-2, ST-6, and EU-1). The cultural materials encountered in the shovel tests and excavation unit consisted exclusively of lithic debitage and fire-cracked rock. Descriptions of the collected artifacts and fire-cracked rock counts are provided in the following pages (Tables 10, 11, 12, and 13). Debitage scattered thinly across the site consists of a variety of chalcedonies, felsite, quartz, and possibly andesite.

Dart Point Preform (1 collected specimen)

Specimen A1 (see Fig 45): Specimen A1 is a white chert dart point fragment that was collected. The fragment has what appears to be a broken beveled exaggerated barb common to Andice dart points from the Early Archaic (ca. 6500–2500 B.C.) period, although this affiliation remains tentative at this time.

Astragalus Bone (1 collected specimen)

The fossilized astragalus, possibly bison, has had several flat facets intentionally cut on its surface. It is possible, because of its location in slump deposits, that it was carried down the creek and redeposited from upstream. Its presence at the site remains a curiosity. This specimen is currently missing from the project collections.

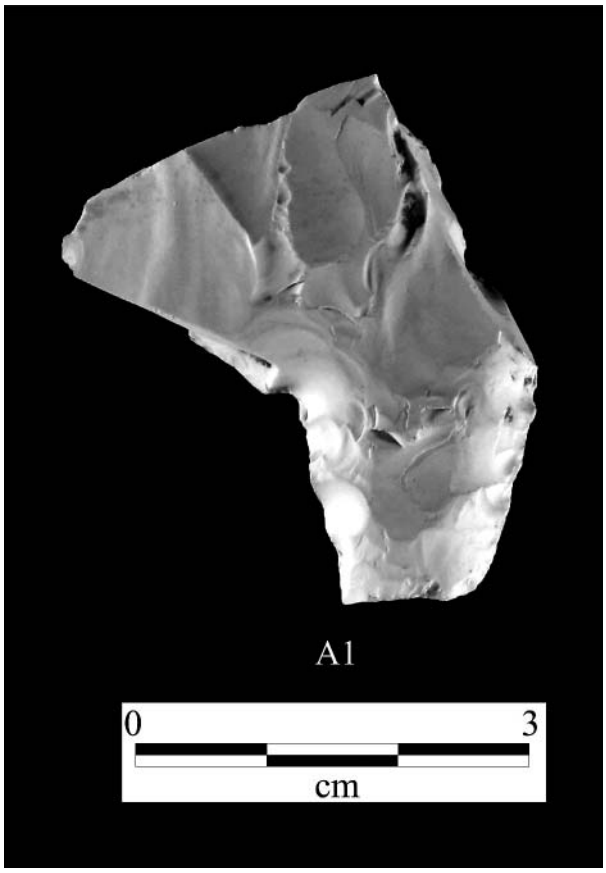


Figure 45. Surface-collected artifact (A1) from the Hackberry Motte site (41BS1104). Photo: E. Blecha.

Table 10: Surface artifacts documented from the Hackberry Motte site (41BS1104)

Spec No.	Type	Description	Material	Collected Yes/No	Max Thick. (mm)	Neck Wdth (mm)
1	Dart Point Preform (?)	Contracting Stem; Proximal Fragment	Chert	Yes	7.6	18.4
2	Utilized Flake	n/a	n/a	No	–	–
3	20-Gauge Shotgun Shell	Casing	n/a	No	–	–
4	Core	Fragment	n/a	No	–	–
n/a	Astragalus	Missing; Possibly Bison; Possibly Modified	Bone	Yes	–	–

n/a = not addressed in field notes

Controlled Shovel Tests 1, 2, and 3 (Table 11)

Shovel Test 1 produced a brown felsite flake from Level 1 (0–10 cm [0–4 in]) and two fragmented flakes (brown chert and dark gray chalcedony) from Level 3 (20–30 cm [8–12 in]). Shovel Test 2 yielded five relatively small pieces of fire-cracked rock from Level 1 (0–10 cm [0–4 in), eight small pieces of fire-cracked rock and a dark bluish-gray chalcedony tertiary flake from Level 2 (20–30 cm [8–12 in]), as well as four small pieces of fire-cracked rock from Level 3 (20–30 cm [8–12 in]). No cultural material was found in ST-3.

Uncontrolled Shovel Tests 4, 5, 6, and 7 (Table 12)

All uncontrolled shovel test units except ST-6 were culturally sterile. The material in this unit consisted of eight small pieces of fire-cracked rock, two tertiary flakes (black hornfels, and off-white chert), one light olive green chert secondary flake, one banded pink and white chert flake fragment, and three fragmented flakes (two off-white chert and a grayish-green serpentine (Cloud 1996).

Table 11: Artifacts from controlled shovel tests at the Hackberry Motte site (41BS1104)

Unit	Provenience	Count	Type	Description	Material	Collected Yes/No
ST-1	0–10 cm	1	Flake	Proximal Fragment	Felsite	Yes
ST-1	20–30 cm	1	Flake	Proximal Fragment	Chalcedony	Yes
ST-1	20–30 cm	1	Flake	Fragment	Chert	Yes
ST-2	0–10 cm	5	Fire-cracked Rock	Small Pieces	–	No
ST-2	10–20 cm	8	Fire-cracked Rock	Small Pieces	–	No
ST-2	10–20 cm	1	Flake	Complete	Chalcedony	Yes
ST-2	20–30 cm	4	Fire-cracked Rock	Small Pieces	–	No

Table 12: Artifacts from uncontrolled Shovel Test 6 at the Hackberry Motte site (41BS1104)

Type	Count	Description	Material	Collected Yes/No
Fire-Cracked Rock	8	Small Pieces	–	No
Flake	1	Angular Shatter	Serpentine	Yes
Flake	1	Fragment; Cortex Remnant	Chert	Yes
Flake	1	Complete	Hornfels	Yes
Flake	1	Complete; Cortex on Platform	Chert	Yes
Flake	1	Fragment	Chert	Yes
Flake	1	Complete	Chert	Yes
Flake	1	Fragment	Chert	Yes

Table 13: Artifacts from controlled Excavation Unit 1 at the Hackberry Motte site (41BS1104)

Provenience (cm below datum)	Count	Type	Description	Material	Collected Yes/No
20–30	1	Flake	Complete	Chert	Yes
20–30	1	Flake	Complete	Chert	Yes
20–30	1	Flake	Complete	Felsite	Yes
20–30	6	Fire-Cracked Rock	Small Pieces	–	No

Controlled Excavation Unit 1 (Table 13)

The upper two levels in this unit were culturally sterile, but Level 3 (20–30 cm [8–12 in] below the surface) yielded cultural material from a depth of 23–29 cm (9–11 in). This material consisted of six small pieces of fire-cracked rock, one dark brown felsite flake, and two flake fragments (yellowish-green chert and variegated yellowish-tan chert). Cultural material was not encountered below 29 cm (11 in) in this test unit. (Cloud 1996).

Stinger Site (41BS1480)

The Stinger site was discovered and documented on June 12–13, 1996, by the SRSU field school team (Fig. 46). Situated on a gravel-capped terrace remnant, this site is a multicomponent open prehistoric site with over 20 prehistoric thermal features and various historic ranching disturbances. The site trends northwest to southeast ca. 400 m (1,312 ft) across the terrace. The northwest end of the site is located 10 m (33 ft) from the westernmost buildings at Elephant Mountain WMA headquarters. The eastern site boundary is 90 m (295 ft) west of Calamity Creek. To the west 70 m (230 ft) is the Rounders site (41BS1481), which is located on an adjacent terrace.

A fence surrounds the WMA headquarters and cuts through the northern portion of the site. A faint historic ranch road crosses the northwest corner of the site

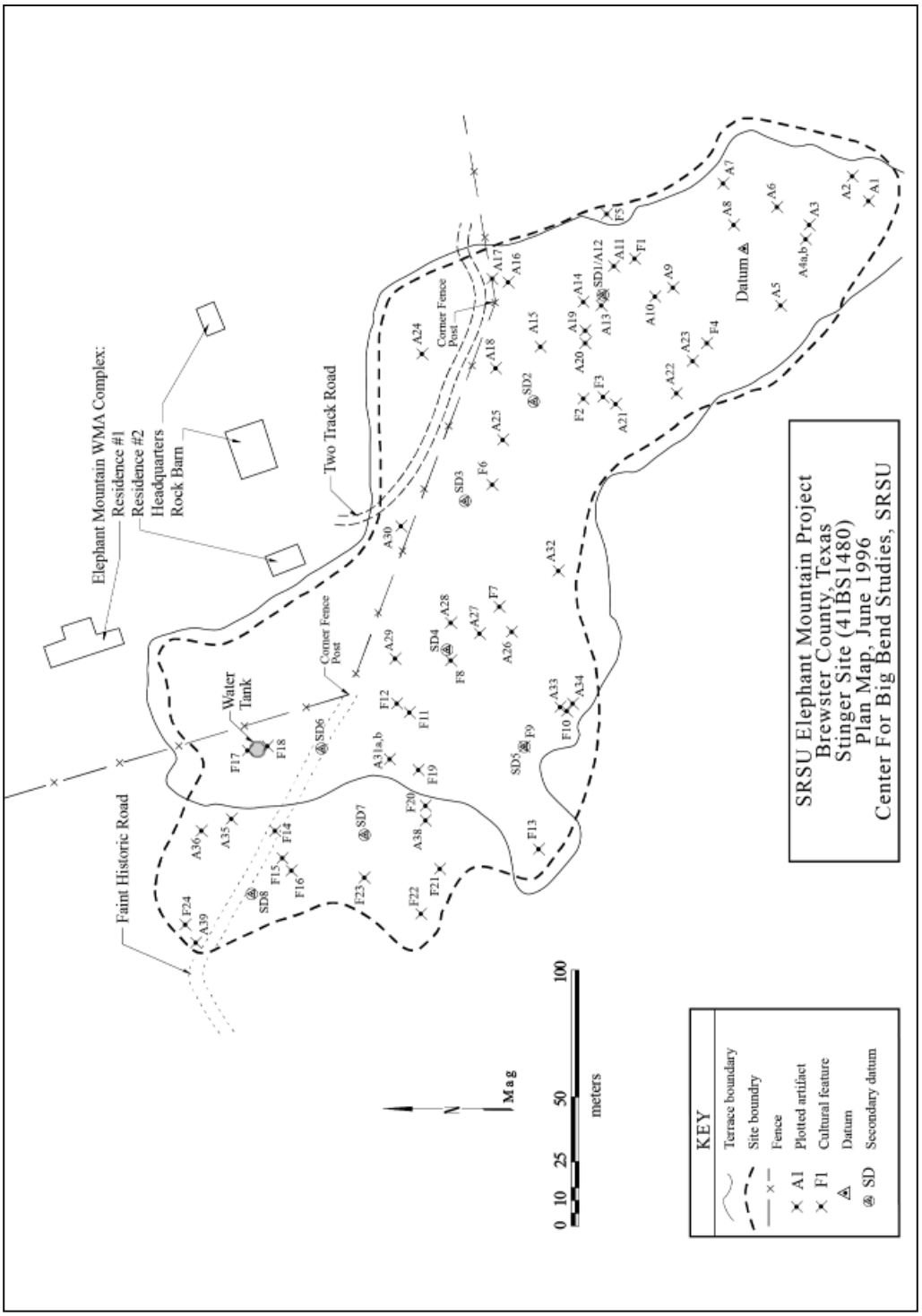


Figure 46. Plan map of the Stinger site (41BS1480). Drafting: D. Hart.

along a modern fence line. Various historical disturbances occur along this fence line, including a rock pile (F17), and a cement pile (F18). A modern road also cuts through the site and parallels the north side of the fence line from an WMA residential building to a work area just east of the eastern site boundary.

At the time of recording, vegetation on the site included honey mesquite (*Prosopis glandulosa*), Russian thistle (*Salsola tragus*), creosote bush (*Larrea tridentata*), tarbush (*Flourensia cernua*), four-winged saltbush (*Atriplex canescens*), cane cholla (*Cylindropuntia imbricate*), yucca (*Yucca* sp.), green condalia (*Condalia viridis*), tasajillo (*Cylindropuntia leptocaulis*), pampas grass (*CortADeria selloana*), and other desert bunch grasses.

Fieldwork

Two mapping datum points—one in the north segment of the site, the other in the south—were set up. A compass and 50-meter tape were used to map the site (Fig. 47). Pedestrian survey of the site revealed 24 cultural features and 43 temporally and/or functionally diagnostic artifacts and tools on the surface. Twenty-seven artifacts were plotted and collected for further analysis. All recorded features, tools, diagnostic artifacts, and modern features were mapped on-site. Detailed notes were taken on the site, features, and artifacts.

Figure 47. Mapping and controlled surface-collecting at the Stinger site (41BS1480). Photo: C. Harrell.

Features

The crew recorded 24 features scattered across the gravel-capped terrace of the Stinger site. Twenty-two are prehistoric thermal features, and two are possibly associated with the historic ranching operation at the site (Table 14). The two possible historic features are a rock pile (F17), and a cement fragment pile (F18) located to the north and south of a water tank and just north of a two-track road. These features are either associated with the historic ranching operation or more recent work performed around the WMA headquarters.

Of the 22 prehistoric thermal features, 20 are hearths (F1 through F9, F11 through F16, F19 through F23), 1 is a fire-cracked rock concentration (F10), and the other is an incipient ring midden (F24). The hearth

Table 14: Cultural features documented on the surface of the Stinger site (41BS1480)

Feature #	Type	Shape	Dimensions (cm)	Condition	% of Intactness
1	Hearth	Amorphous	340 x 200	Scattered	5
2	Hearth	R. Circular	40	Partially Intact	35
3	Hearth	R. Oval	100 x 120	Scattered	0
4	Hearth	R. Linear	330 x 100	Scattered	40
5	Hearth	R. Circular	40	Intact	90
6	Hearth	R. Oval	80 x 65	Partially Intact	70
7	Hearth	Linear	170 x 50	Partially Intact	<10
8	Hearth	Circular	90 x 100	Scattered	15
9	Hearth	R. Circular	40 x 50	Partially Intact	60
10	FCR Concentration	Amorphous	600 x 400	Scattered	<10
11	Hearth	Oval	n/a	Partially Intact	15
12	Hearth	Amorphous	83 x 75	Scattered	10
13	Hearth	Oval	110	Partially Intact	70
14	Hearth	R. Oval	n/a	Scattered	5
15	Hearth	Amorphous	n/a	Scattered	10
16	Hearth	Circular	65 x 60	Scattered	10
17	Rock Pile	Amorphous	140	Scattered	10
18	Cement Frag Pile	Circular	190 x 130	Partially Intact	10
19	Hearth	Oval	100 x 60	Scattered	<10
20	Hearth	Amorphous	n/a	Scattered	<10
21	Hearth	Amorphous	n/a	Scattered	20
22	Hearth	Oval	40	Partially Intact	30
23	Hearth	R. Oval	60	Partially Intact	40
24	Incipient Ring Midden	Unknown	n/a	Partially Intact	70

n/a = not addressed in field notes; R = roughly

shapes are oval (n=8), amorphous (n=5), circular (n=5), and linear (n=2) and range in size from 40 to 340 cm (16 to 130 in) in diameter (average diameter: 108 cm [43 in]). All except one hearth (F5) are partially intact or scattered. The incipient ring midden (F24) has a mesquite and soil hummock at the northeast edge of the feature and appears to have associated lithic debitage. The thermal features are generally comprised of rhyolite, or other igneous thermally fractured cobbles. These prehistoric thermal features are concentrated in the northwestern portion of the site.

Artifacts

Field school participants mapped 43 functionally and/or temporally diagnostic prehistoric artifacts on the surface of the Stinger site, 27 of which were collected for further analysis. Most of the recorded artifacts were concentrated along the top of the remnant terrace. Groundstone artifacts (manos) were concentrated in the southeastern section of the site, but also occurred in the northwest and central sections of the site. Fifteen projectile points (complete and fragmented) were recovered from the site including Late Archaic Paisano (500 B.C.–AD 800; n=4) and Ensor (200 B.C.–A.D. 1000) dart points (n=1), Late Prehistoric Livermore (A.D. 800–1300; n=1) and Perdiz (A.D. 1200–1700) arrow points (n=6), as well as untypable dart and arrow points (n=3) (Figs. 48 and 49). Other specimens recorded include: manos (n=5), utilized flakes (n=3), thin and thick bifaces (n=8), cores (n=3), scrapers (n=7), and debitage (Figs. 50 and 51). Material types include agates, chalcedony, chert, claystone, felsite, and possibly diorite (various colors and qualities represented). The recorded artifacts are described in more detail below (Table 15).

One of the Perdiz arrow points (A23) was discovered in association with a hearth (F4). A fire-cracked rock scatter (F10), rep Fire-Cracked Rock resenting one or two scattered hearths, had possible associations of 8–10 pieces of debitage, an end scraper (A33), and a spokeshave (A34).

Ensor Dart Point (1 collected specimen)

Specimen A40 (Fig. 48): Made from gray chalcedony, this specimen has shallow U-shaped side notches with an expanding stem. The basal edge is convex and as wide as the shoulders. The blade is slightly off-set, and one lateral blade is convex, while the other is slightly concave.

Paisano Dart Points (4 collected specimens)

Specimen A5 (Fig. 48)*:* This specimen has an off-set blade and a concave basal edge with rounded basal ears. One lateral blade edge is straight, and the other is strongly convex. The blade element is heavily reworked and short (27 mm [1 in] in length). Manufactured from white chert, this specimen is poorly made and thick (7.2 mm [.3 in] thick).

Specimen A7 (Fig. 48): Specimen A7 is complete and made from yellowish-brown chert with white chalcedonic inclusions. The lateral blade edges are moderately to extremely convex and converge to a graver-like

Table 15: Documented surface artifacts from the Stinger site (41BS1480)

Spec No.	Type	Material	Collected Yes/No	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
1	Mano	n/a	No	–	–	–	–
2	Mano	n/a	No	–	–	–	–
3	Thick Biface	Chert	No	–	–	–	–
4a, b	Perdiz Arrow Point	Chert	Yes	–	–	2.2	8.3
5	Paisano Dart Point	Chert	Yes	27	19.8	7.2	–
6	Side Scraper	n/a	No	–	–	–	–
7	Paisano Dart Point	Chert	Yes	33.1	23.4	9.6	21.4
8	Core	Chert	Yes	59.2	49.1	27.7	–
9	Biface	Chert	No	–	–	–	–
10	Thick Biface	Diorite?	Yes	48.7	43	15.2	–
11	Biface	Chert	No	–	–	–	–
12	Mano	n/a	No	–	–	–	–
13a, b, c, d, e	Side and End Scraper	Felsite	Yes	66.9	47.1	12	–
14	Scraper	Chert	No	–	–	–	–
15	Utilized Flake	Felsite	No	–	–	–	–
16	End Scraper	Chert	Yes	37.7	36.9	12.1	–
17	Paisano Dart Point	Chert	Yes	33.4	22.8	8.7	19.2
18	Livermore Arrow Point	Chert	Yes	24.3	–	3.5	6.4
19	Mano	n/a	No	–	–	–	–
20	Mano	n/a	No	–	–	–	–
21	Uniface	Chert	No	–	–	–	–
22	Untypable Dart Point	Chert	No	–	–	–	–
23	Perdiz Arrow Point	Chert	Yes	30.8	–	2.5	5.2
24	Paisano Dart Point	Chert	Yes	40.9	18.9	6.2	–
25	Thin Biface	Chert	Yes	38.1	–	6.2	–
26	Perdiz Arrow Point	Chert	Yes	–	12.7	3.6	4.6
27	Perdiz Arrow Point	Chert	Yes	–	–	2.5	–
28	Perdiz Arrow Point	Chert	Yes	–	–	1.9	5.4
29	Utilized Flake	Chert	Yes	49	29.4	5.4	–
30	Core	Plume Agate	Yes	86.7	80.6	50.5	–
31a	Core	Claystone	Yes	~185	70.7	51.1	–
31b	Flake	Claystone	Yes	24.5	15.5	4.5	–
32	Perdiz Arrow Point	Chert	Yes	–	–	1.9	4.8

Table 15: Documented surface artifacts from the Stinger site (41BS1480) *(continued)*

Spec No.	Type	Material	Collected Yes/No	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
33	End Scraper	Chert	Yes	–	24.6	6.6	–
34	Utilized Flake	Chert	Yes	35.5	38.5	11.9	–
35	Thin Biface	Chert	No	–	–	–	–
36	Scraper	Felsite	No	–	–	–	–
37	Thin Biface	Plume Agate	Yes	31.1	19.9	7.1	–
38	Thin Biface	Chert	No	–	–	–	–
39	End Scraper	Chert	Yes	50.4	37.4	9.4	–
40	Ensor Dart Point	Chalcedony	Yes	41.6	20	7.1	14.4
41	Untypable Arrow Point	Chert	Yes	–	–	2.3	–
42	Untypable Arrow Point	Chert	Yes	–	14.3	1.6	6.4

n/a = not addressed in field notes

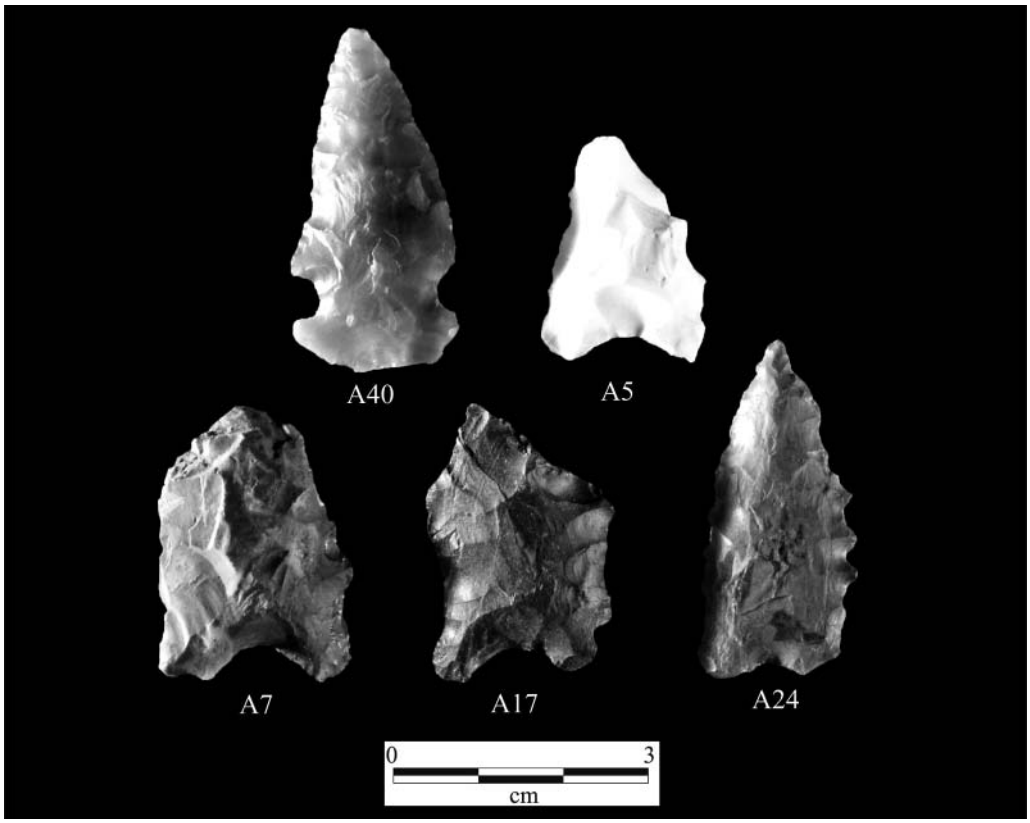


Figure 48. Surface-collected dart points from the Stinger site (41BS1480). Photo: E. Blecha.

tip on the distal end. One lateral blade edge is moderately serrated. The specimen has very weak shoulders and a strongly concave basal edge with rounded basal ears.

Specimen A17 (Fig. 48): This Paisano dart point is repurposed into a graver. One lateral blade edge is strongly convex, and the other is extremely recurved to create an off-set distal graver tip. This specimen has weak shoulders and a wide expanding stem. The basal edge is strongly concave with rounded basal ears. Made from black chert with thin brown bands, the specimen is poorly thinned.

Specimen A24 (Fig. 48): This Paisano dart point has moderately to extremely serrated convex lateral blade edges. The hafting element is slightly expanding with a concave basal edge and rounded basal ears. The specimen is manufactured from yellowish-brown and red chert.

Untypable Dart Point

Specimen A22 is a medial fragment of an untypable off-white chert dart point.

Livermore Arrow Point (1 collected specimen)

Specimen A18 (Fig. 49): This Livermore arrow point has one large laterally extending barb and a parallel-sided stem with a convex basal edge (the other barb is missing). One blade edge is straight, the other convex irregular. It is made from yellowish-brown and red banded chert.

Perdiz Arrow Points (6 collected specimens)

Specimen A4a, b (Fig. 49): Manufactured from a black chert flake or blade, this specimen is comprised of two refitted fragments—a medial portion of the blade (4b), and a distal portion of the point (4a). The distal tip, two barbs, and the stem are missing. From what remains of the barbs, they were likely long, and the stem was likely contracting. The specimen is corner notched and well thinned on the dorsal face (2.2 mm [.09 in] thick). On the ventral face, the specimen is only worked along the outer edge of the barbs and stem.

Specimen A23 (Fig. 49): This specimen is very well made with micro serrations on the straight lateral blade edges. The stem is long and slightly contracting with a convex basal edge. The stem, as well as the barb, is worked bifacially and the dorsal face is completely worked. One barb is missing while the remaining barb is long and pointed with a deep V-shaped corner notch. The specimen is made from a light pink chert flake or blade.

Specimen A26 (Fig. 49): This specimen has one convex and one slightly concave blade edge. Both blade edges are strongly serrated. The distal tip and stem are missing, and one barb is reworked into a shoulder. The barb is small and downturned. The specimen is made from a gray chert blade or flake.

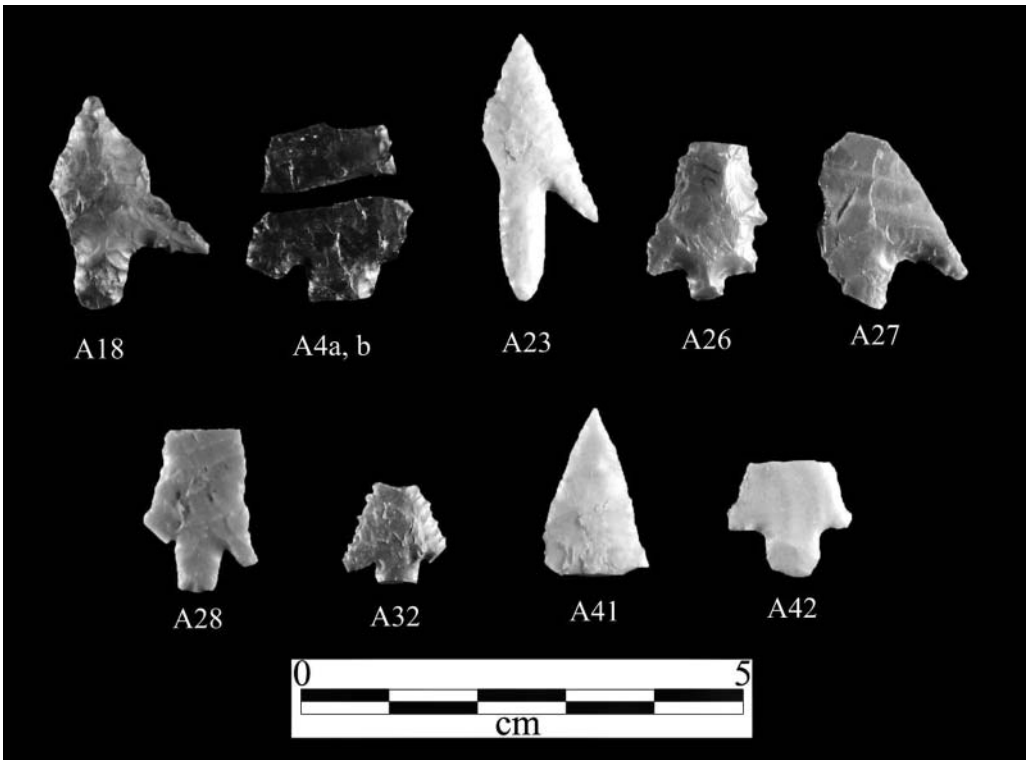


Figure 49. Surface-collected arrow points from the Stinger site (41BS1480). Photo: E. Blecha.

Specimen A 27 (Fig. 49): Specimen A27 has a broad triangular blade element with strongly beveled blade edges on the ventral face. A portion of the blade element, the contracting stem, and one barb are missing. The remaining lateral blade edge is straight with a long barb and wide U-shaped corner notch. The toolstone is dark gray chert with brown bands.

Specimen A28 (Fig. 49): This long-bladed Perdiz arrow point has slightly concave lateral blade edges and a contracting stem. The basal edge is slightly convex with square basal corners. Made of light gray chert, this specimen is missing the distal blade and one barb. The remaining barb is long and narrow and extends downward. The specimen is bifacially worked on both sides. A small area of ventral surface is located in the center of the blade element, above a "knot," suggesting this area could not be adequately thinned.

Specimen A32 (Fig. 49): The smallest of the Perdiz arrow points, this specimen has a small, yet broad, triangular blade. The blade edges are straight and have small, intricate serrations. Although portions of both barbs are missing, they were likely long, judging from the narrow V-shaped corner notches. The stem and distal tip are also

missing. Manufactured from dark gray chert, the dorsal face was thinned and worked well. One barb shows evidence of being worked on the ventral face.

Untypable Arrow Points (1 uncollected; 2 collected specimens)

Specimen A41 (Fig. 49): This light tan chert specimen is missing the distal blade; however, the lateral blade edges appear straight. The barbs are small and laterally extended. The bulbous stem is short with a convex basal edge. The specimen is unifacial and minimally worked on the lateral blade edges and corner notches, and the stem and basal edge are thinned. The specimen is very thin and straight with a plano-convex cross section.

Specimen A42 (Fig. 49): This is a long triangular blade fragment with slightly convex lateral blade edges. The barbs/shoulders and the stem are missing. The dorsal face of this specimen is completely worked, and a "knot" is present next to the fracture where the toolstone could not be adequately thinned. On the ventral face, the distal tip is worked. The specimen is made from pinkish-tan fossiliferous chert.

Thin Bifaces (2 uncollected; 2 collected specimens)

Two thin biface fragments were field recorded but not collected from the Stinger site. One was manufactured from caramel chert (A35), and the other from an opaque off-white chert, Descriptions of two other collected thin bifaces follow.

Specimen A25 (Fig. 50): This thin late-stage biface is circular with a slightly concave, oblique basal edge. A hinge fracture has removed one lateral blade edge from the specimen. Manufactured from yellowish-brown chert, this specimen is worked and utilized along the basal and lateral blade edges. The specimen is lenticular in cross section.

Specimen A37 (Fig. 50): This pointed-ovate biface is short (31.1 mm [1.2 in] long) with slightly convex blade edges and a straight basal edge. The specimen is manufactured from red and purple plume agate and still retains the curve of the flake. One lateral margin exhibits use-wear, and the basal edge is thinned.

Thick Bifaces (1 uncollected; 1 collected specimen)

Specimen A13 is a light yellowish-brown chert biface that was not collected from the site. Below is the description of the only collected thick biface from 41BS1480.

Specimen A10 (Fig. 50): Made of greenish-gray coarse-grained (possible) diorite, this circular biface was expediently manufactured. The specimen is roughly worked bifacially along one lateral margin, giving the margin a scalloped or wavy appearance. Due to the nature of the toolstone, it is difficult to discern edge use-wear.

Unknown Bifaces (2 uncollected specimens)

Two bifaces were recorded but not collected from the site. Specimen A9 is made

Figure 50. Surface-collected bifaces from the Stinger site (41BS1480). Photo: E. Blecha.

from dark black or gray chert, and specimen A11 is a white chert biface fragment that is heavily patinated.

End Scrapers (3 collected specimens)

Specimen A16 (Fig. 51): This circular scraper is made from mottled tan and light brown chert. The specimen is thickest near the platform and is worked on its lateral and distal margins. An area of the lateral edge is missing.

Specimen A33 (Fig. 51): The proximal end of this domed-ovate side and end scraper is missing. This variegated yellow and pink chert scraper retains cortex along one lateral margin. The dorsal face is well thinned.

Specimen A39 (Fig. 51): This ovate end scraper is made of gold-colored chert. The dorsal face is domed, and the platform of the specimen is prepared but crushed.

Side and End Scraper (1 collected specimen)

Specimen A13a, b, c, d, and e: This specimen is comprised of 5 pieces (2 large and 3 small) of fine-grain red felsite that can be refitted. This ovate specimen is a unifacially modified side and end scraper that exhibits edge use-wear. The opposing lateral margin is unworked. A large protrusion is present close to the unworked margin and distal end of the specimen.

Unknown Scrapers (3 uncollected specimens)

Three scrapers were recorded but not collected from the site. Specimen A6 is noted as a side scraper; however, the other two are not specified as to which edge was modified.

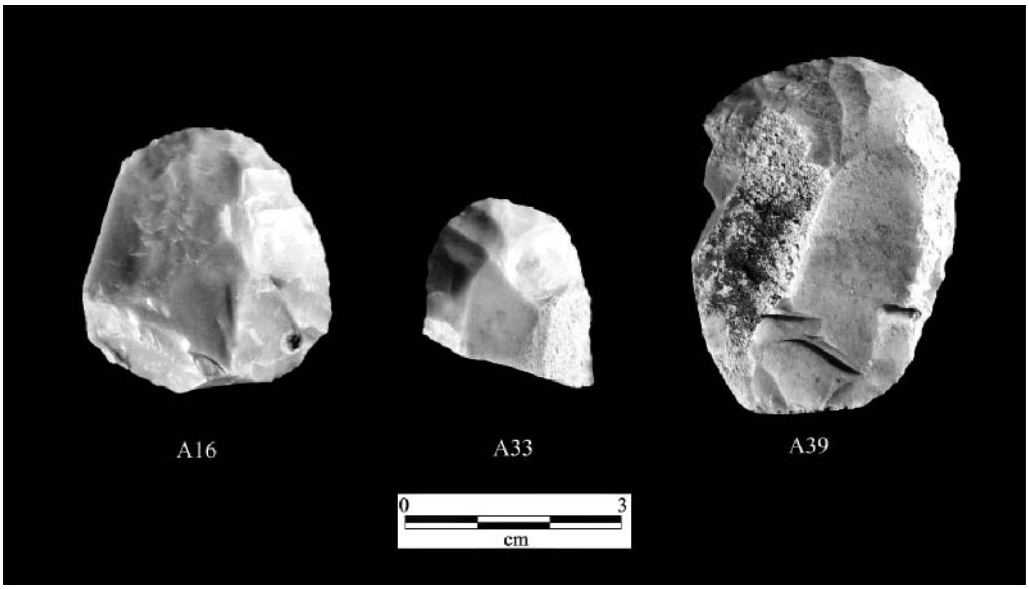


Figure 51. Surface-collected scrapers from the Stinger site (41BS1480). Photo: E. Blecha.

Specimen A36 is a dark felsite scraper with a possible bit edge on the platform end, and specimen A14 is a brown fragmented chert scraper.

Uniface (1 uncollected specimen)

Specimen A21 was recorded but not collected. It is unifacially worked and fragmented and made from medium gray chert. This specimen is heavily patinated on one side.

Utilized Flakes (1 uncollected; 2 collected specimens)

Specimen A15 is a dark red felsite utilized flake that was recorded but not collected from the site. Below are descriptions of the utilized flakes that were collected.

Specimen A29: This flake is long and thin with expanding lateral edges and a convex distal end. The specimen exhibits use-wear along the convex hinge termination and the thin and sharp lateral edges. The specimen has a cortex platform. The parent material is variegated gray chert.

Specimen A34: Specimen A34 is a minimally worked and utilized greenish-gray chert flake. The flake is thick and triangular shaped. Cortex is present along one lateral margin. The distal end is minimally modified. The specimen was likely utilized for a scraping task.

Cores (3 collected specimens)

Specimen A8: The smallest of the cores, this specimen is comprised of turquoise banded chert and has cortex on two sides. It is tabular and multidirectional.

Specimen A30: Made of red, blue, and white chalcedonic chert, this core is conical and is modified and utilized along one of its margins.

Specimen A31a and b: This specimen is comprised of 2 pieces—1 large core (A31a) and one refitted small flake (A31b)—of red and black banded claystone. The core is large (ca. 185 mm [7 in] long), tabular, and multidirectional, with red cortex on two sides and multiple negative flake scars. The flake is tertiary with a feather termination.

Manos (5 uncollected specimens)

Five manos were recorded within the Stinger site (A1, A2, A12, A19, and A20). Four specimens are fragmented; one of these fragments was noted as being one-sided. The complete specimen (A12) is a two-sided mano.

Rounders Site (41BS1481)

The Rounders site was discovered and recorded on June 13, 1996, by the SRSU archaeological field school team (Fig. 52). This is a multicomponent open prehistoric site on a terrace system roughly 800 m (2,625 ft) west of Calamity Creek. Site dimensions are 118 m (387 ft) (north to south) by 120 m (394 ft) (east to west); Texas State Highway 118 lies 200 m (656 ft) to the east of the site. The entrance road to Elephant Mountain WMA is 200 m (656 ft) to the north. The Stinger site (41BS1480), discussed above, is located 70 m (230 ft) to the east. The surface of the Rounders site is relatively flat with a slight slope to the west. Remnants of an old ranch road (two-track) cuts through the northern portion of the site from east to west. Elephant Mountain looms to the east, Cathedral Mountain is visible to the north-northwest, and Crosson Mesa is visible to the west.

Vegetation occurring on the site at the time of recording included four-winged saltbush (*Atriplex canescens*), tarbush (*Flourensia cernua*), honey mesquite (*Prosopis glandulosa*), Russian thistle (*Salsola tragus*), tasajillo (*Cylindropuntia leptocaulis*), and desert bunch grasses.

Fieldwork

Upon discovery, the Rounders site was systematically mapped and surface-collected by field school participants. The survey team documented 14 thermal cultural features and conducted controlled surface collection of 13 temporally and/or functionally diagnostic artifacts. A mapping datum was established in the south-central area of the site. Using a compass and 50-meter tape, the crew mapped the features, surface artifacts, and site boundaries.

The crew returned to the Rounders site on June 25, 1996, to investigate 3 (F4, F6, and F10) of the 14 recorded cultural features. The purpose of this revisit was threefold: 1) to obtain scale drawings of the features, 2) to obtain radiometric and botanical samples from feature matrices, and 3) to assess the integrity and conditions of the three features to guide future studies at the site.

In order to maintain horizontal and vertical control during excavation, 1 x 1 m (3 x 3 ft) units were established with metric tapes and chaining pins over all three features. Unit sizes were enlarged when and if needed. An arbitrary datum of 100 m (328 ft) and an instrument station was established

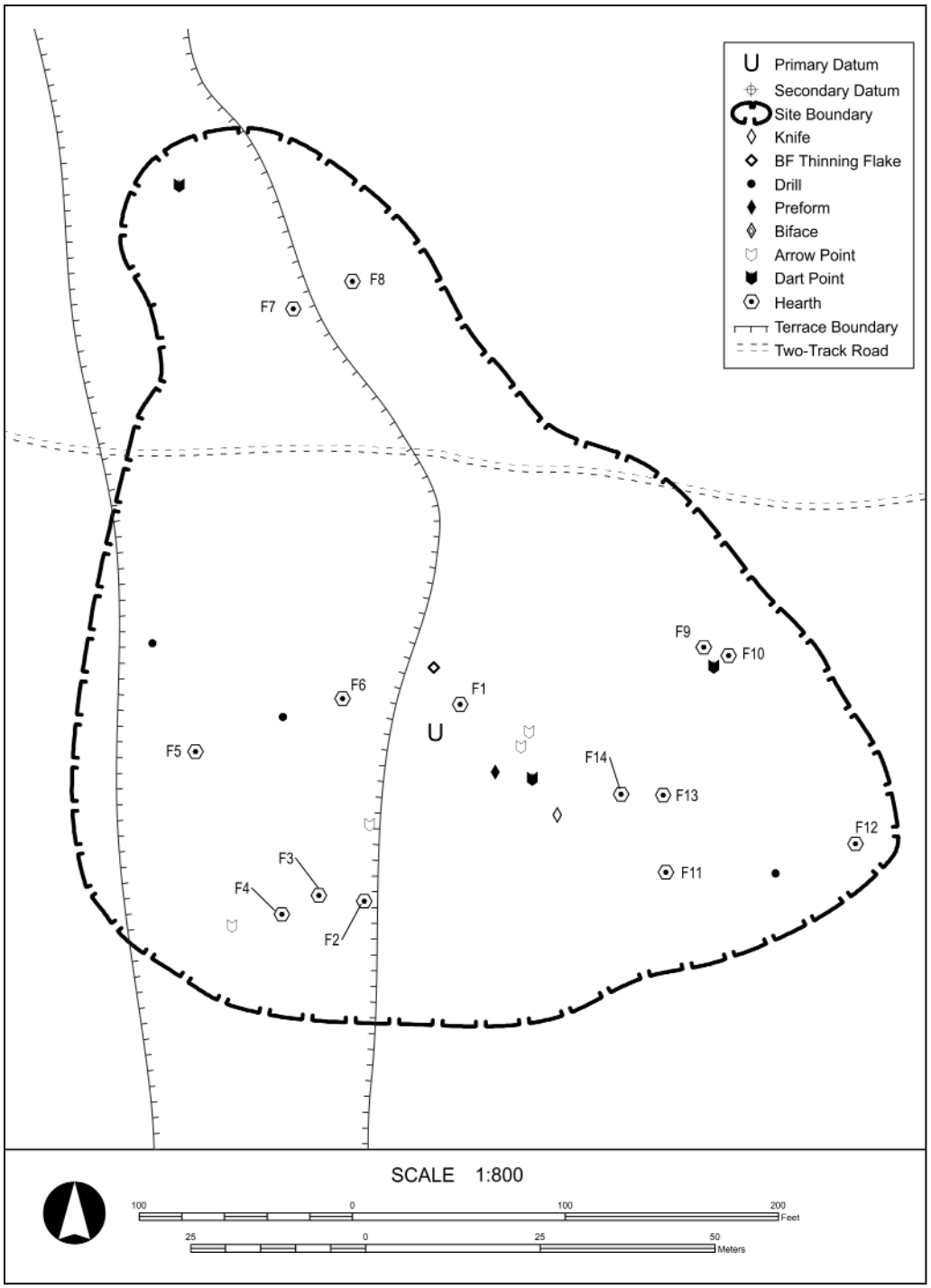


Figure 52. Plan map of Rounders site (41BS1481). Drafting E. Blecha.

outside of each of the three units to ensure stratigraphic control. Areas outside the features were excavated in arbitrary levels and all subsurface artifact recovery was accomplished using one-quarter-inch hardware cloth screens. Feature matrices were excavated as a unit, without use of arbitrary levels. Features were bisected to obtain cross sections, and excavation unit walls were profiled.

Excavation Unit A—Feature 4

Excavation Unit A was placed over Feature 4, a thermal feature, and excavated on June 24–26 (Figs. 53 and 54). On the surface of this feature, within the excavation unit, was one small flake. The unit was first excavated in the south two-thirds of the 1 x 1m (3 x 3 ft) unit to obtain a profile of the feature. The profile did not show any evidence of a pit and so the complete unit was excavated to chase out charcoal flecks and uncover the morphology of the thermal feature (which was oval). The hearth was comprised of 14 embedded stones, 4 of which were vesicular basalt.

The unit was terminated at 75 cm (30 in) below ground surface when sediments became sterile. Only fragmented bone was observed and collected in the unit, including four fragments in Level 2. No stone debitage was observed.

Twelve charcoal samples were collected during the excavation of this feature—2 samples from Level 1 (0–10 cm [0–4 in]) and 10 samples from Level 2 (10–20 cm

Figure 53. Excavation of Unit A, Feature 4, at the Rounders site (41BS1481). Photo: R. Mallouf.

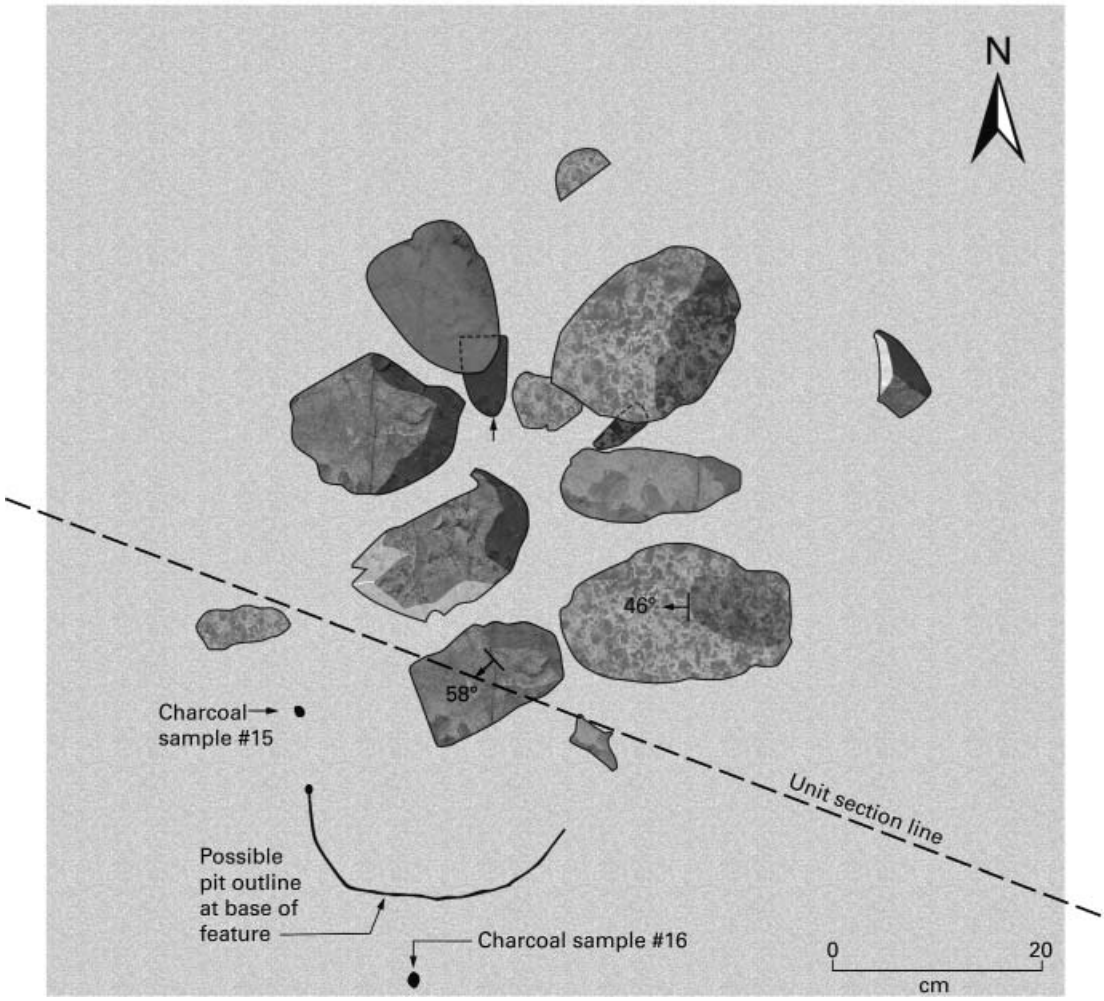


Figure 54. Schematic of Unit A, Feature 4, at the Rounders site (41BS1481). Drafting: L. Wetterauer.

[4–8 in]). The two charcoal samples from Level 1 (Radiocarbon Samples 4 and 8) were taken from immediately outside of the hearth and were not submitted for assay. Out of the 10 charcoal samples taken from Level 2, 3 samples were collected just outside the hearth (Radiocarbon Samples 11, 16, and 22), while the 7 were either collected from inside the hearth or on the edge under a piece of fire-cracked rock (Radiocarbon Samples 10, 15, and 17–21). Radiocarbon Sample 10 was submitted for assay and returned a calibrated date of A.D. 1417–1644 (cal. 534–307 years B.P.), placing this feature in the terminal Late Prehistoric to Contact period.

Excavation Unit B—Feature 6

Excavation Unit B was set over Feature 6, a thermal feature, and excavated on June 25 and 26 (Fig. 55). Prior to excavation three artifacts, including two flakes (one utilized)

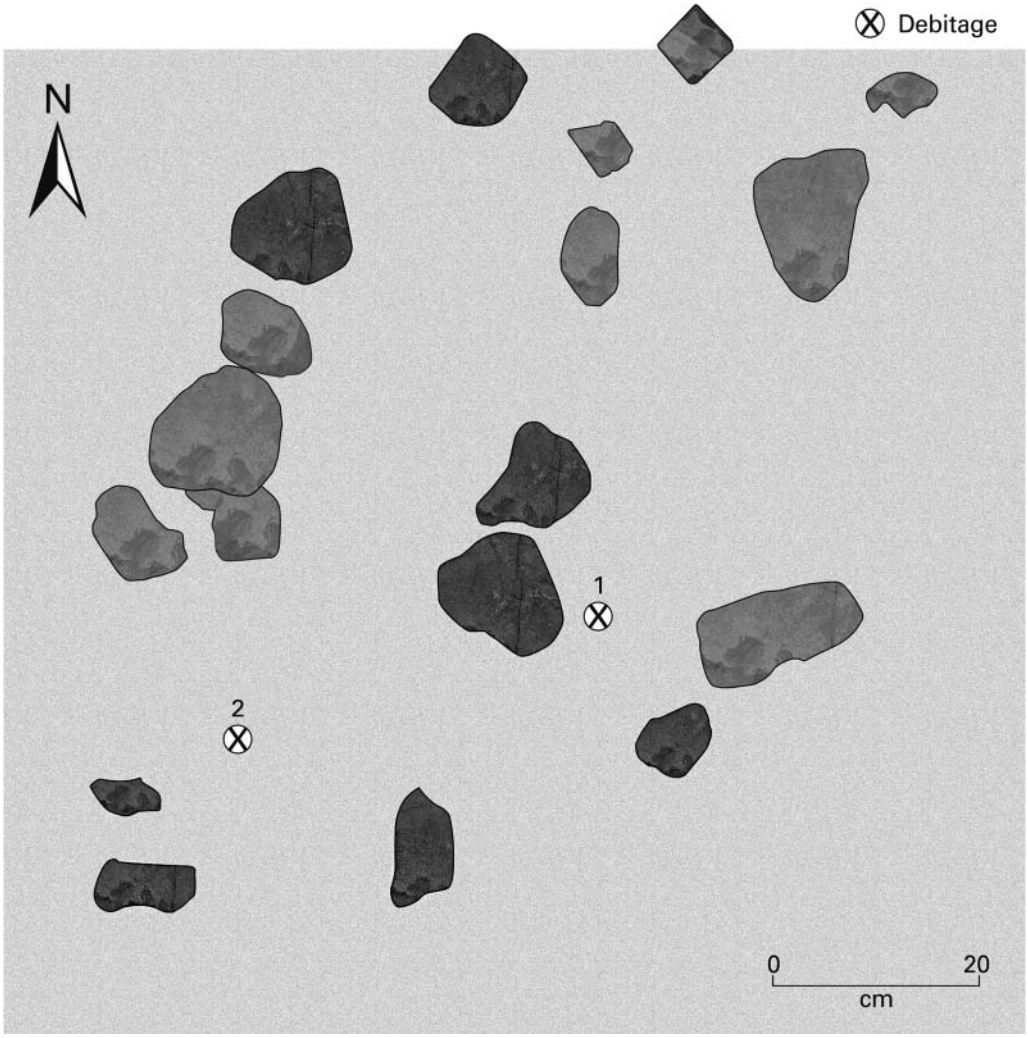


Figure 55. Schematic of Unit B, Feature 6, at the Rounders site (41BS1481). Drawing by L. Wetterauer.

and a Perdiz arrow point (B-3), were recovered from the interior surface of this feature. The feature was exposed in plan, and then cross-sectioned to obtain a hearth profile; however, the feature proved to be badly disturbed and scattered with no visible pit outline. Four charcoal samples were collected from Feature 6, three from inside (Radiocarbon Samples 6, 7, and 9) and one from outside the feature (Radiocarbon Sample 5). The presence of an associated Perdiz point on the surface interior of the feature suggests affiliation with the terminal Late Prehistoric to Contact period.

Excavation Unit C—Feature 10

A 50 x 100 cm (20 x 40 in) unit was placed initially in a manner to cross-section Feature 10, a small hearth partially exposed on the ground surface (Figs. 56 and 57). Although fairly intact, the feature did not yield charcoal and yielded only minimal artifactual

material. The adjacent half of the feature was then exposed with similar results. Thermal fracturing of hearthstones was minimal, indicating only minimal use of this feature by the camp's inhabitants. A small cluster of hackberry seeds encountered in the feature did not appear to have cultural origins.

Figure 56. Initiating cross section of Feature 6, Excavation Unit B, Rounders site (41BS1481). Photo: R. Mallouf.

Features

In addition to the 3 hearth features described above that were subjected to excavation at 41BS1481, there were 11 additional small circular to oval hearths scattered across the site surface. The features were primarily concentrated in the central and southern half of the site and tended to be clustered together in groups of two to

Figure 57. Excavation of Feature 10, Excavation Unit C, at the Rounders site (41BS1481). Photo: R. Mallouf.

three. Of the total 14 hearth features, 2 were intact (F4 and F10), nine are partially intact (F2, F3, F5, F6, F8, F9, F11, F13, and F14), and 3 were scattered (F1, F7, and F12). The hearths were variable in shape (triangular, oval, circular, and amorphous) and averaged 125 cm (49 in) in diameter. While the excavations did not yield any diagnostic artifacts, the crew was able to establish that the cultural deposits extend from the surface to 25 cm (10 in) below the surface. Additional data concerning cultural features at the Rounders site is provided in Table 16.

Artifacts

Lithic debitage is scattered across the surface of the Rounders site but is concentrated, along with cultural features, in the south-central subarea of the site. Most formal artifacts recovered (n=13) at the site were clustered here as well (Table 17 and Figs. 58 and 59). The excavation of Features 4, 6, and 10 recovered a few pieces of debitage, fragments of bone, a uniface, and a cluster of hackberry seeds (Tables 18, 19, and 20). A Perdiz arrow point was recovered in association with F6, on the interior surface of the feature (Fig. 60). Toolstone used in the manufacture of implements include variegated chert, jaspers, chalcedony, agate, rhyolite, basalt, and indurated sandstone.

Artifacts recorded and collected on the site include a Late Archaic Shumla (1300–200 B.C.; n=1) and Conejo (n=1) dart points,

Table 16: Cultural features documented on the surface of the Rounders site (41BS1481)

Feature #	Type	Shape	Dimensions (cm)	Condition	% of Intactness	Comment
1	Hearth	Amorphous	90	Scattered?	n/a	–
2	Hearth	Unknown	95	Unknown/ Partially Intact	n/a	–
3	Hearth	Oval	97 x 95	Partially Intact	n/a	–
4	Hearth	Oval	102 x 64	Intact	100	Excavation A
5	Hearth	Circular	145	Partially Intact	90	–
6	Hearth	R. Oval	120 x 80	Partially Intact	40	Excavation B
7	Hearth	Amorphous	145 x 204	Scattered	n/a	–
8	Hearth	Triangular	60 x 40 x 40	Partially Intact	20	–
9	Hearth	Eroded	100	Partially Intact	40	–
10	Hearth	Eroded	170	Intact	90	Excavation C
11	Hearth	Amorphous	155	Partially Intact	30	–
12	Hearth	Unknown	293 x 330	Scattered	30	–
13	Hearth	Unknown	100	Partially Intact	30	–
14	Hearth	Unknown	40 x 223	Partially Intact	30	–

n/a = not addressed in field notes; R = roughly

Table 17: Surface-collected artifacts from the Rounders site (41BS1481)

Spec No.	Type	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
1	Biface Thinning Flake	Chalcedony	–	19.6	3.4	–
2	Cliffton Arrow Point	Chert	–	20.2	3.9	9.4
3	Perdiz Arrow Point	Chert	–	–	2.5	6.5
4	Shumla Dart Point	Chert	–	–	7	17.1
5	Arrow Preform	Jasper	32.5	20.8	6.1	–
6	Thin Bifacial Knife	Chert	–	34.5	6.7	–
7	Untyped Projectile Point	Chert	–	–	3.1	–
8	Perdiz Arrow Point	Chert	–	18	2.2	8.3
9	Flake Drill	Chert	29.3	19.7	5.1	13.3
10	Flake Drill	Chert	–	19.2	3.4	–
11	Conejo Dart Point	Chalcedony	–	–	6.4	17.2
12	Untyped Dart Point	Chert	–	–	5.2	–
13	Flake Drill	Chert	25.6	16.6	3.5	–

Late Prehistoric Perdiz (1200–1700 A.D.; n=2) and Cliffton arrow points (n=1), untyped projectile point fragments (n=2), an arrow point preform (n=1), flake drills (n=3), a thin bifacial knife (n=1), and a biface thinning flake (n=1) (Fig. 58). Based on all recovered data, the Rounders site appears to have been occupied during both Late Archaic and Late Prehistoric/Contact period times, with the latter best represented.

Conejo Dart Point (1 specimen)

Specimen A11 (Fig. 58): What remains of this Conejo dart point is a wide and short, slightly expanding stem and one small barb. The specimen is corner notched and has a slightly concave basal edge with rounded basal ears. The toolstone is high-quality grayish-brown chalcedony, and the specimen is well made.

Shumla Dart Point (1 specimen)

Specimen A4 (Fig. 58): This Shumla dart point is corner notched with a small barb and a short and wide, slightly expanding/bulbous stem. The basal edge is slightly convex with round basal corners. The specimen is missing the distal tip, a lateral blade edge, and shoulder. The remaining lateral blade edge is slightly convex. The basal edge is thinned but the rest of the specimen is relatively thick. The toolstone is yellowish-brown chert.

Untyped Dart Point (1 specimen)

Specimen A12 (Fig. 58): This is the midsection from a small dart point. The cross section is lenticular with slightly convex lateral edges. It is bifacially worked and made from dark yellowish-brown chert.

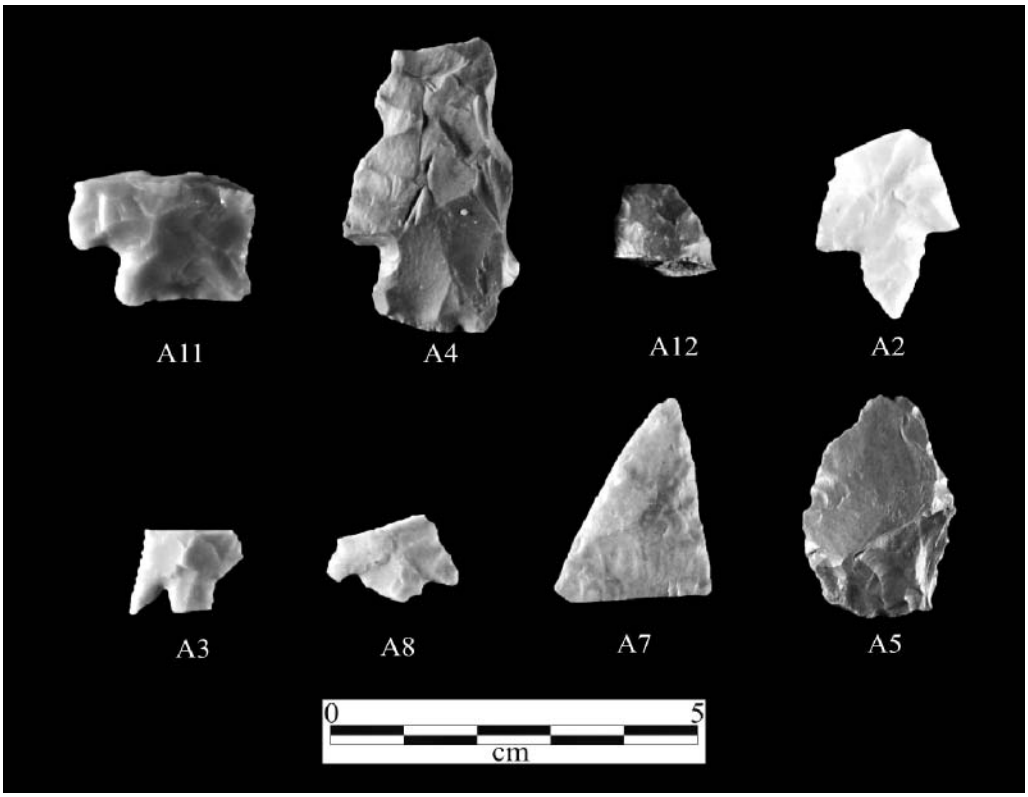


Figure 58. Surface-collected artifacts from the Rounders site (41BS1481). Photo: E. Blecha.

Cliffton Arrow Point (1 specimen)

Specimen A2 (Fig. 58): This specimen has a broad, triangular blade element with one barb missing and the other reworked into a strong shoulder that protrudes from the neck at right angles. The lateral blade edges are straight, and the distal blade is missing. The sharply pointed contracting stem has one convex lateral stem edge and one straight. The ventral face is worked along the stem and one lateral blade margin. The toolstone is tan fossiliferous chert.

Perdiz Arrow Points (2 specimens)

Specimen A3 (Fig. 58): This fragmented Perdiz point has straight, finely serrated blade edges. The stem is contracting, and the barbs are pointed and long. The specimen has V-shaped corner notches and is made from a light brown chert flake or blade. It is missing the distal blade, one barb, and the basal edge.

Specimen A8 (Fig. 58): This Perdiz arrow point fragment consists of two moderate-sized barbs with a portion of lateral blade and neck of the stem. The specimen is thin (2.2 mm [.08 in]), bifacially worked, and made from a yellowish-tan chert flake. On the ventral face the specimen is worked only on the barbs and around the neck of the stem.

Untyped Projectile Point (1 specimen)

Specimen A7 (Fig. 58): This long and narrow triangular blade is well thinned with straight lateral blade edges. The specimen is manufactured from a mottled purple chert flake or blade. The thinness of the specimen suggests that it is an arrow point; however, because it is missing the shoulders/barbs and stem, this is difficult to determine.

Arrow Preform (1 specimen)

Specimen A5 (Fig. 58): This pointed-ovate biface is small (32.5 mm [1.28 in] long), crudely manufactured, and likely an arrow point preform that was discarded by the knapper. It has one extremely convex lateral edge and one recurved. The basal edge is slightly convex with one rounded corner and one squared. Made from a yellowish-brown jasper flake, the specimen has a large "knot" in the center that could not be removed. The base on both faces and the lateral blade edges are minimally worked.

Thin Bifacial Knife (1 specimen)

Specimen A6 (Fig. 59): This thin biface, while missing the proximal end, is leaf- and diamond-shaped with one strongly convex blade edge and one convex angular. The blade is offset and reworked along the angular blade edge. Manufactured from mottled light gray fossiliferous chert, this specimen has thinned but slightly sinuous lateral blade edges.

Flake Drills (3 specimens)

Specimen A9 (Fig. 59): Made from a dark bluish-gray high-quality chert flake, this specimen is expediently manufactured. Remnant flake scars and small areas of cortex are visible on both blade faces. The blade

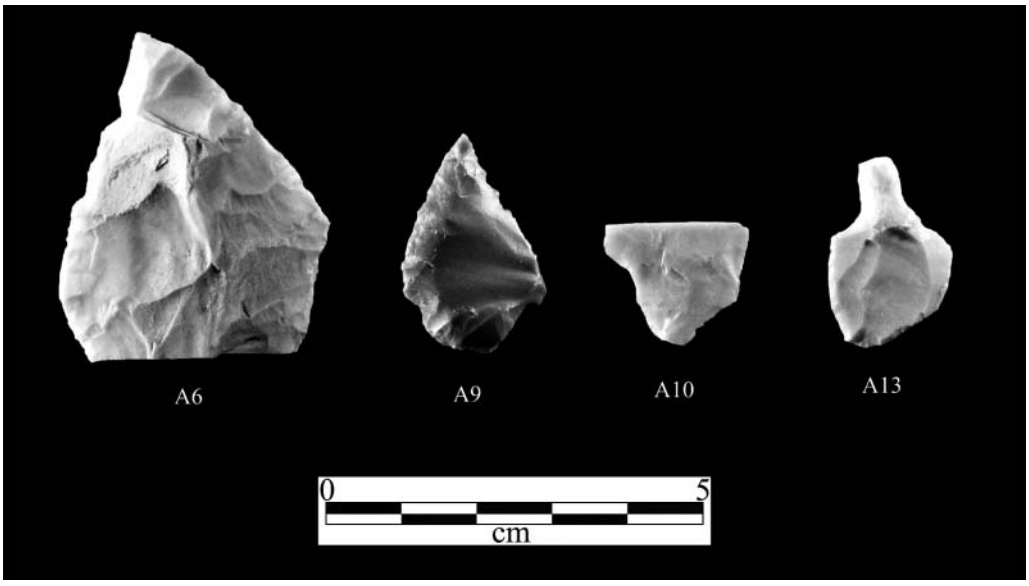


Figure 59. Knife fragment and flake drills recovered from the surface of the Rounders site (41BS1481). Photo: E. Blecha.

is offset with one convex blade edge and one recurved. The convex blade edge is strongly beveled on the ventral face, while the other blade edge is serrated and beveled along the distal tip or bit. The specimen has a short, wide bulbous stem and is corner notched with a weak shoulder and a small barb. The basal edge has a hinge fracture that is partially reworked into a convex edge on the dorsal face.

Specimen A10 (Fig. 59): While the distal end, or bit, is missing, the morphology of this specimen suggests it is a drill. It is bifacially worked and thinned with one large fracture along the blade and another along the distal protuberance or stem. Manufactured from light pinkish-tan chert, the stem of this specimen is irregular and contracting.

Specimen A13 (Fig. 59): This drill was manufactured from a tan chert flake. The edges of the flake are slightly beveled, and the striking platform was removed. The main body of the flake is well thinned on the dorsal face. The drill was made on the distal end of the flake and is lenticular in cross section. The drill bit is snapped in half but measures 5.4 mm (.21 in) wide x 3.2 mm (.13 in) thick.

Biface Thinning Flake

Specimen A1: This is a yellow chalcedony biface thinning flake that is utilized along both lateral margins. The striking platform is small and prepared. The distal portion of the flake is missing.

Excavation Unit A, Feature 4 (6 specimens; Table 18)

Surface Level

Specimen A-01: Located on the surface within F4, this specimen is the distal end of a yellowish-tan and purple banded chert flake with red cortex along one margin.

Level 2 (10–20cm [4–8 in]) South Section of Unit A

Specimen A-L1 (n=4): This is a small (9.8 mm [.4 in] long) complete tertiary flake. The parent stone is dark yellowish-brown chert with a feather termination.

Level 2 (10–20cm [4–8 in]) North Two-thirds of Unit A

Specimen A-L2: Four pieces of fragmented bone were collected from the north two-thirds of Unit A. Fragments are likely from a medium-sized mammal. No charring is present.

Table 18: Cultural materials recovered from EU-A, Feature 4, of the Rounders site (41BS1481)

Provenience	Spec No.	Type	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)
Surface	A-01	Flake	Chert	9.6	9.5	1.1
Level 2 (10–20 cm)	A-L1	Flake	Chert	9.8	8.3	1.4
Level 2 (10–20 cm)	A-L2	Bone	Bone	–	–	–

Excavation Unit B, Feature 6 (3 specimens; Table 19)

Surface Level (3 specimens)

Specimen B-1: This is a mottled tan fossiliferous chert flake with a snapped termination. The platform is partially crushed.

Specimen B-2: This flake tool is 40.9 mm (1.6 in) long x 25.6 mm (1 in) wide with a hinge termination. One lateral margin is moderately serrated and worked.

Specimen B-3 (Fig. 60): This Perdiz arrow point has one straight and one slightly convex lateral edge. Both edges are unsystematically serrated. There are two tiny intentionally fashioned prongs at the distal tip. The stem is long and slightly contracting with a convex basal edge. Both faces are completely worked. One barb is missing, and the other barb is reworked into a shoulder. The toolstone is mottled pinkish-tan chert.

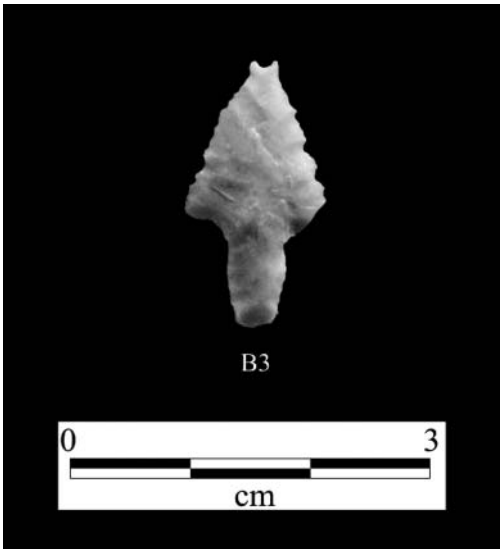


Figure 60. Modified Perdiz arrow point (B3, Table 19) from Feature 6 at the Rounders site (41BS1481). Photo: E. Blecha.

Excavation Unit C, Feature 10 (5 specimens; Table 20)

Level 1 (0–10 cm [0–4 in]) (5 specimens)

Specimens C-L1 Unplotted (n=3): Three pieces of debitage were recorded from Level 1 in Unit C. Two pieces are from the same purple chert toolstone, each with the same white cortex on a portion of the specimen. The other flake is a proximal fragment of a tan chert flake.

Specimen L-1: This is a complete flake with a small prepared platform and a hinge termination. The parent material is the same as the two pieces of unplotted purple chert debitage of this same level. A large area of cortex is present on the dorsal face.

Table 19: Cultural materials from EU-B, Feature 6, of the Rounders site (41BS1481)

Provenience	Spec No.	Type	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
Surface	B-1	Flake	Chert	23.6	22.5	4.4	–
Surface	B-2	Uniface	Chert	40.9	25.6	7.2	–
Surface	B-3	Perdiz Arrow Point	Chert	22.8	11.6	2.5	4.7

Table 20: Cultural materials from EU-C, Feature 10, of the Rounders site (41BS1481)

Provenience	Spec No.	Type	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)
Level 1 (0–10 cm)	C-L1	3 Flakes	Chert	–	–	–
Level 1 (0–10 cm)	L-1	Flake	Chert	25.6	17.5	6.2
Level 1 (0–10 cm)	L-2	Flake	Chert	12.3	11	3.3
Level 2 (10–20 cm)	C-L2	22 Hackberry Seeds	Seeds	–	–	–

Specimen L-2: This small piece of dark gray chert debitage is thermally altered. A pot-lid removed a large portion of the ventral face.

Level 2 (10–20 cm [4–8 in]) (22 specimens)

Specimen C-L2: 22 hackberry seeds.

Diamondback Site (41BS1482)

The Diamondback Site was discovered and recorded on June 14, 1996, by the archaeological field school team (Fig. 61). This is a multicomponent open prehistoric site having 19 thermal features on the surface and 1 subsurface hearth located in an integral cutbank. The site measures 180 m (591 ft) (N-S) x 125 m (410 ft) (E-W) and occupies the top of an elevated terrace on the west bank of Calamity Creek. The site is located ca. 800 m (2,625 ft) upstream from the Calamity Creek and Sheep Creek confluence. The hillside lodge and Elephant Mountain WMA headquarters are visible to the north and northeast from the site.

The level-to-slightly-undulating terrace system here contains widely distributed stream-worn gravels. To the north of the site, and forming a portion of the northern site boundary, is a headward-eroding gully that trends northwest-southeast into Calamity Creek. Large honey mesquite trees (*Prosopis glandulosa*) grow on the site, along with creosote bush (*Larrea tridentata*), Texas croton (*Croton texensis*), cane cholla (*Cylindropuntia imbricate*), prickly pear (*Opuntia* sp.), other cacti, various grasses, blackbrush acacia (*Acacia rigidula*), and yucca (*Yucca* sp.). At the time of recording, a well-established two-track dirt road cut across the northern portion of the site. The road enters the site from the northwest and exits northeast, cutting across Calamity Creek. A secondary two-track road deviates from the primary two-track road northeast towards the gully. Five meters (16 ft) to the south of the roads' intersection lies a modern landfill and back-dirt pile.

Fieldwork

After initial discovery, the Diamondback site was systematically mapped, surface-collected, sampled, and profiled. A thorough investigation of the site revealed 20 cultural features and 28 temporally/functionally diagnostic artifacts (27 of which were collected) on the ground surface. The site was mapped using a compass and

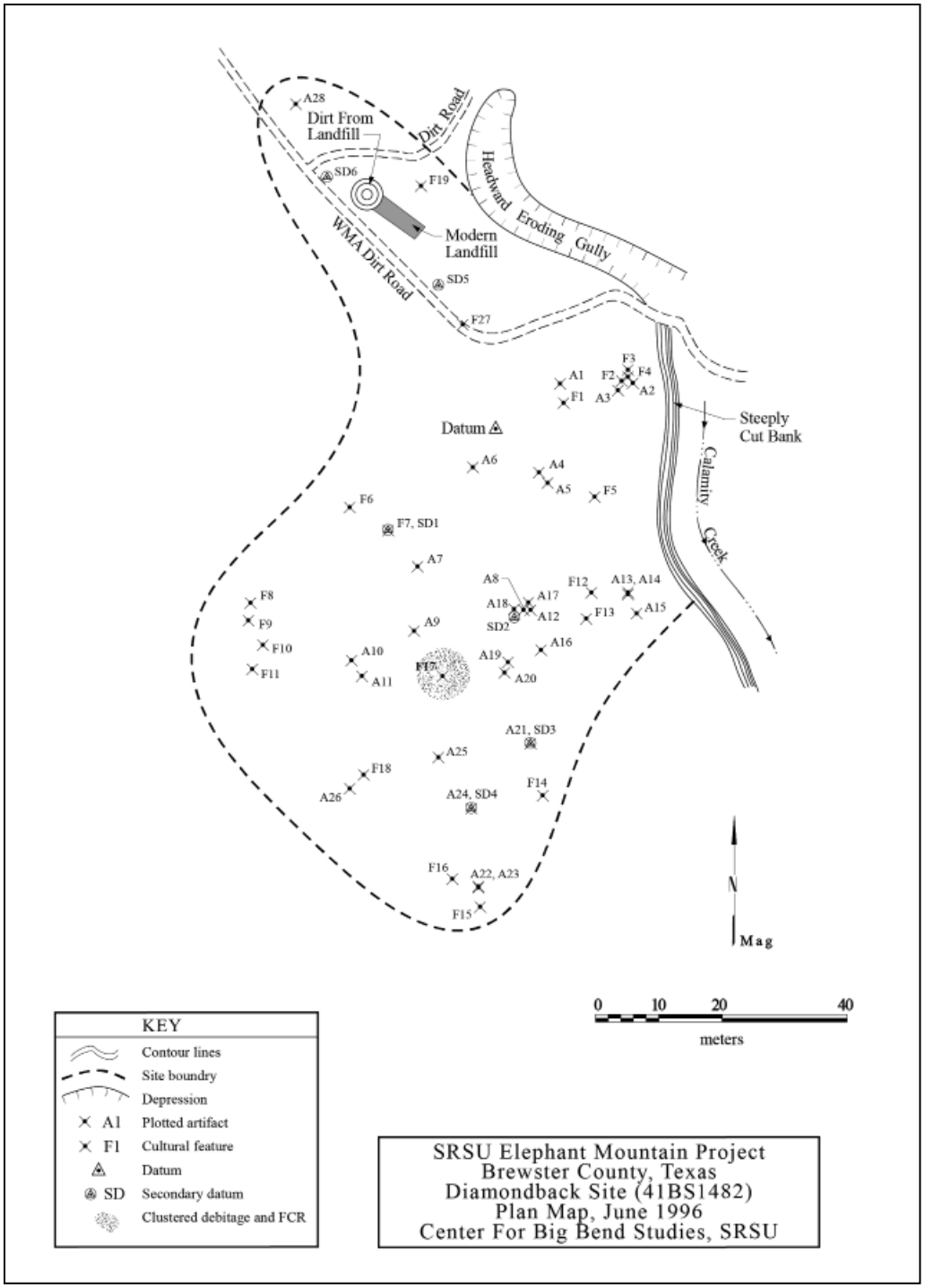


Figure 61. Plan map of the Diamondback site (41BS1482). Drafting: D. Hart.

50-meter tape. A primary central datum point and six secondary datums were set up throughout the site to aid in the mapping of features and artifacts.

A 1 x 1 m (3 x 3 ft) section of the west bank face of Calamity Creek was cut, cleaned, and profiled (Fig. 62). This profile cut exposed a hearth (F20) at ca. 40 cm (16 in) below ground surface. A matrix sample (Matrix Sample 5) and three charcoal samples (Radiocarbon Samples 23, 13, and 14) were taken from the area of the buried feature. Radiocarbon Sample 14 was the only charcoal sample taken from the interior matrix of the buried hearth (F20; see below).

Features

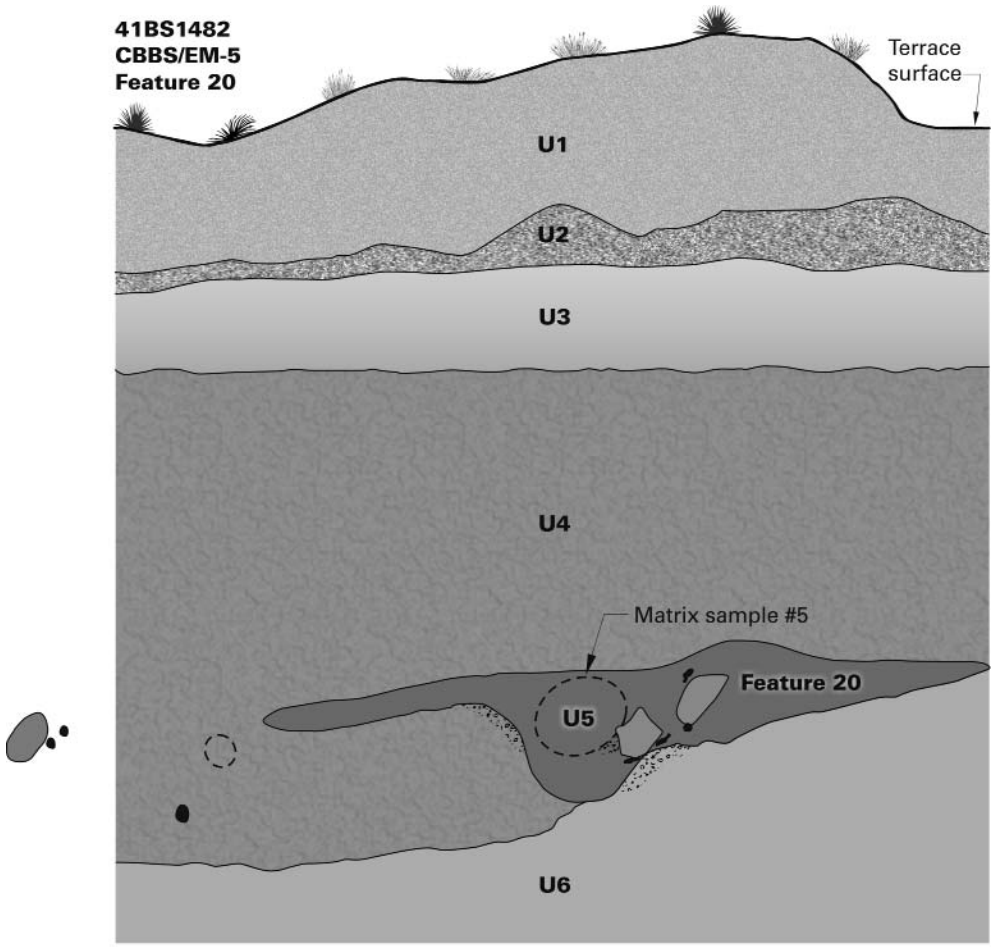
While the Diamondback site probably contains many above and below ground cultural features, at the time of recording they were difficult to distinguish from surrounding natural gravels. Only a total of 20 thermal features could be distinguished with confidence, and these were mapped. The recognizable hearths tended to be small (ca. 50–75 cm [20–30 in] diameters) with minimal amounts of associated stone. Thermal fracturing and discoloration were obvious among some hearth stones. Two thermal features (F7 and F17) appeared to be associated with concentrated amounts of lithic debitage.

Feature 17 comprises a notable concentration of fire-cracked rock and is located in the south-central portion of the site. Having a diameter of ca. 17 m (56 ft), this FCR cluster may represent a scattered incipient ring midden.

The hearth feature (F20) mentioned earlier, discovered at 40 cm (16 in) below the ground surface in the cutbank of Calamity Creek, yielded a calibrated radiocarbon assay of A.D. 1529—out of range, indicating a probable Contact period occupation. On the other hand, a charcoal sample taken ca. 2 m (7 ft) away from F20 at roughly the same elevation in the cutbank yielded an assay of A.D. 1263–1394 (ca. 688–556 yrs. B.P.), or well within the Late Prehistoric period. Details concerning the 20 thermal features documented at 41BS1482 are provided in Table 21.

Artifacts

Twenty-eight artifacts, 27 of which were collected, were mapped on the surface of the Diamondback site. The artifact not collected was a mano (A2). Most diagnostic artifacts were recovered within the northeast subarea of the site. Artifacts include Late Prehistoric Toyah (A.D. 900–1700; n=1) and Diablo (A.D. 1200–1700; n=1) arrow points; a Late Archaic Paisano (500 B.C.–A.D. 800; n=1), Hueco (1000 B.C.–A.D. 500; n=1), and Shumla (1300–200 B.C.; n=1) dart points; an untypable arrow point (n=1); a dart point preform (n=1); a side scraper (n=1); end scrapers (n=3); a thin biface (n=1); gravers (n=2); denticulate flakes (n=2); a perforator (n=1); a unifacial preform (n=1); hammerstone (n=1); cores (n=2); utilized flakes (n=3); and miscellaneous flakes (n=3) (Figs. 63, 64, and 65). Toolstones used in manufacture include highly variable chalcedonies, variegated cherts, jaspers, plume agate, andesite, claystone, quartzite, sandstone, basalt, and rhyolite.



U1 medium brown sandy loam, poorly consolidated, numerous rootlets

U2 medium to coarse mostly quartz sand, subangular to angular, minor silt component fluvial deposit

U3 upper - fine crossbedded silty sand, variegated medium to light brown, some rootlets present, blocky, fairly well consolidated
lower - medium brown sandy silty, carbonate stringers, well consolidated, rootlets, blocky

U4 rootlets with roots 1 cm and larger, bioturbation, insect casts, blocky, dark brown, charcoal flecks, well consolidated, carbonate stringers, fine

U5 charcoal, FCR, bioturbated, less well consolidated than confining layers, 1-1/2 cm root at base, rootlets, charcoal lenses, insect casts, medium brown fine sandy loam

U6 well consolidated, blocky, subangular, lots of carbonate stringers, medium brown with whitish carbonate sheen, fine sandy loam, root casts and rootlets, charcoal flecks

Figure 62. Profile in the cutbank at the Diamondback site (41BS1482). Drawing by L. Wetterauer.

Table 21: Cultural features documented at the Diamondback site (41BS1482)

Feature #	Type	Shape	Dimensions (cm)	Condition	% of Intactness
1	Hearth	R. Circular	40	Intact	100
2	Hearth	Unknown	75	Partially Intact	80
3	Hearth	R. Circular	70	Partially Intact	50
4	Hearth	R. Circular	50	Partially Intact	100
5	Hearth	R. Circular	60	Intact	50
6	Hearth	Amorphous	n/a	Scattered	>10
7	Hearth	R. Oval	110 x 60	Partially Intact	50
8	Hearth	R. Circular	57	Partially Intact	60
9	Hearth	R. Circular	60	Partially Intact	60
10	Hearth	Unknown	n/a	Partially Intact	20
11	Hearth	Amorphous	n/a	Scattered	<10
12	Hearth	R. Circular	54	Partially Intact	90
13	Hearth	Unknown	n/a	Partially Intact	80
14	Hearth	n/a	n/a	n/a	n/a
15	Hearth	n/a	n/a	Scattered	<10
16	Hearth	n/a	n/a	Scattered	<10
17	FCR & Lithic Scatter	Amorphous	17	Scattered	<10
18	Hearth	Amorphous	n/a	Partially Intact	20
19	Hearth	Unknown	60	Partially Intact	80
20	Hearth (cutbank)	Unknown	n/a	Partially Intact	n/a

n/a = not addressed in field notes; R = roughly

Most of the diagnostic artifacts occurred in the northeast section of the site. End and side scrapers were fairly common throughout the site, as were cores, denticulate flakes, and gravers. Additional data concerning recovered artifacts at the site is provided in Table 22.

Based on both surface-recovered artifacts and radiocarbon dates, the Diamondback site was occupied at intervals during the Late Archaic (1000 B.C.–A.D. 700), Late Prehistoric (A.D. 700–1535), and possibly Contact periods.

Hueco Dart Point (1 specimen)

Specimen A8 (Fig. 63): This Hueco dart point is corner notched with an expanding stem and convex basal edge. The blade edges are slightly convex, and the one existing barb is small. This specimen is thermally altered. A large pot-lid on a blade face possibly removed one of the barbs. The toolstone is pink, white, and blue chert.

Paisano Dart Point (1 specimen)

Specimen A28 (Fig. 63): This Paisano dart point has an off-set blade with straight blade edges. Both shoulders are rounded, and one is weaker than the other. The stem is wide and slightly expanding with an extremely concave basal edge and two rounded basal ears. This specimen is made of dark red chert and is thickest at the distal tip.

Table 22: Surface-documented artifacts from the Diamondback site (41BS1482)

Spec No.	Type	Material	Collected Yes/No	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
1	Thin Biface	Chert	Yes	–	31.9	6.9	–
2	Mano	n/a	No	–	–	–	–
3	Graver	Chert	Yes	26.6	20.4	4.3	n/a
4	Toyah Arrow Point	Chert	Yes	19.9	14.7	2	6.9
5	Utilized Flake	Chert	Yes	46.2	35.2	12.3	–
6	Diablo Arrow Point	Chert	Yes	–	–	2	6
7	Hammerstone/Core	Plume Agate	Yes	68.9	72.3	46.3	–
8	Hueco Dart Point	Chert	Yes	43.9	–	6.2	13.2
9	End Scraper	Chalcedony	Yes	36.8	34.5	9.9	–
10	Untyped Arrow Point	Chert	Yes	–	11.2	3	–
11	Denticulate Flake	Andesite	Yes	73	40	16.8	–
12	Unifacial Preform	Chert	Yes	31.7	37.7	7.2	–
13	Side Scraper	Chalcedony	Yes	32.7	38.5	8.5	–
14	Denticulate Flake	Chalcedony	Yes	14.9	21.7	4.8	–
15	Flake	Chert	Yes	24.2	18.3	4.1	–
16	Flake	Jasper	Yes	33	28.7	5.9	–
17	Core	Chert	Yes	64.7	43.6	35.7	–
18	Utilized Flake	Chert	Yes	34.2	27.7	8	–
19	Perforator	Chert	Yes	37.4	18.6	6.6	–
20	Utilized Flake	Chert	Yes	40.4	26.6	6.5	–
21	Core	Chalcedony	Yes	54.4	46.3	37	–
22	Dart Preform	Chert	Yes	–	21	9.4	–
23	Shumla Dart Point	Chert	Yes	–	23.8	4.4	12
24	End Scraper	Claystone	Yes	54.9	37.5	20	–
25	Flake	Volcanic other	Yes	28.5	32.5	6.1	–
26	Graver	Chert	Yes	24.3	15.4	3.6	–
27	End Scraper	Chert	Yes	45.2	50.5	12.1	–
28	Paisano Dart Point	Chert	Yes	36.8	20.6	6	16.7

n/a = not addressed in field notes

Shumla Dart Point (1 specimen)

Specimen A23 (Fig. 63): This Shumla dart point has a heavily reworked blade element that is short and wide. The distal blade tip, as well as both barbs, are missing. The stem is straight and expands slightly at the base with a slightly convex basal edge. It is fashioned from pink likely heat-treated chert.

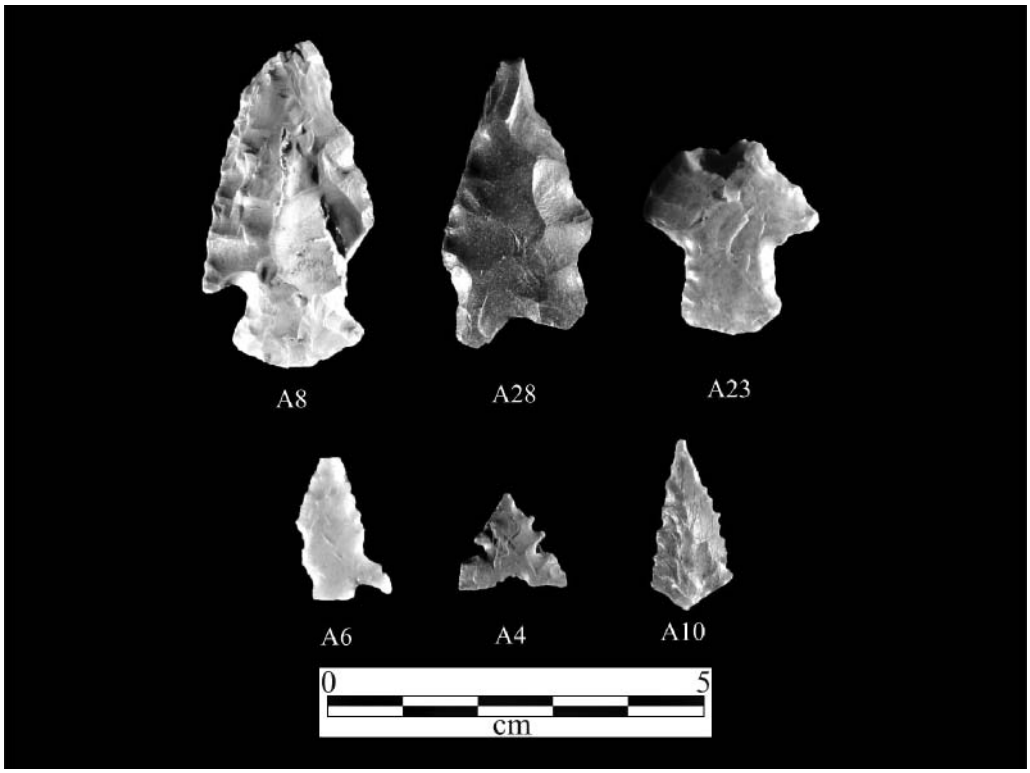


Figure 63. Surface-collected dart and arrow points from the Diamondback site (41BS1482). Photo: E. Blecha.

Diablo Arrow Point (1 specimen)

Specimen A6 (Fig. 63): This Diablo arrow point has a narrow triangular blade element with slightly convex and serrated lateral blade edges. The distal tip, one barb, and a portion of the stem are missing. The barb that is present is exaggerated and arches downward in a hook-like curve. The specimen has deep and wide U-shaped corner notches and is made from pinkish-white chert.

Toyah Arrow Point (1 specimen)

Specimen A4 (Fig. 63): This Toyah arrow point is small and triangular with side and basal notches. The lateral blade edges are straight—one side has two exaggerated serrations. The basal edge is slightly concave with a shallow wide notch in the center. The two side notches are narrow and U-shaped. The pointed basal ears are large compared to the blade element. This specimen is bifacially worked and made from a turquoise-colored chert flake.

Untyped Arrow Point (1 specimen)

Specimen A10 (Fig. 63): This specimen is the blade element of an arrow point. The specimen is moderately serrated and unifacially worked. One blade edge is straight, and the other is slightly convex. A "knot" is present at the base of the blade where the

toolstone could not be adequately thinned. The specimen is made of mottled yellowish-brown and red chert.

Dart Point Preform (1 specimen)

Specimen A22 (Fig. 64): This is the distal blade element of a dart point preform. The specimen is thick and poorly manufactured of yellowish-brown banded chert. One lateral blade edge is convex while the other is slightly concave. ***Thin Biface (1 specimen)***

Specimen A1 (Fig. 64): This specimen is the distal blade of a thin late-stage biface. The lateral blade edges are both convex. There are multiple small low-rise "knots" on both faces where the specimen could not be adequately thinned. Made from dark yellowish-brown chert, the biface is well made.

Unifacial Preform (1 specimen)

Specimen A12 (Fig. 64): This is a unifacial preform that snapped in half while being thinned. Although missing its proximal end, there is a large, flute-like thinning flake that is present from the hinge fracture to the distal tip. The lateral edges of the specimen are well thinned, and one edge is beveled. Use-wear is evident on the lateral margins

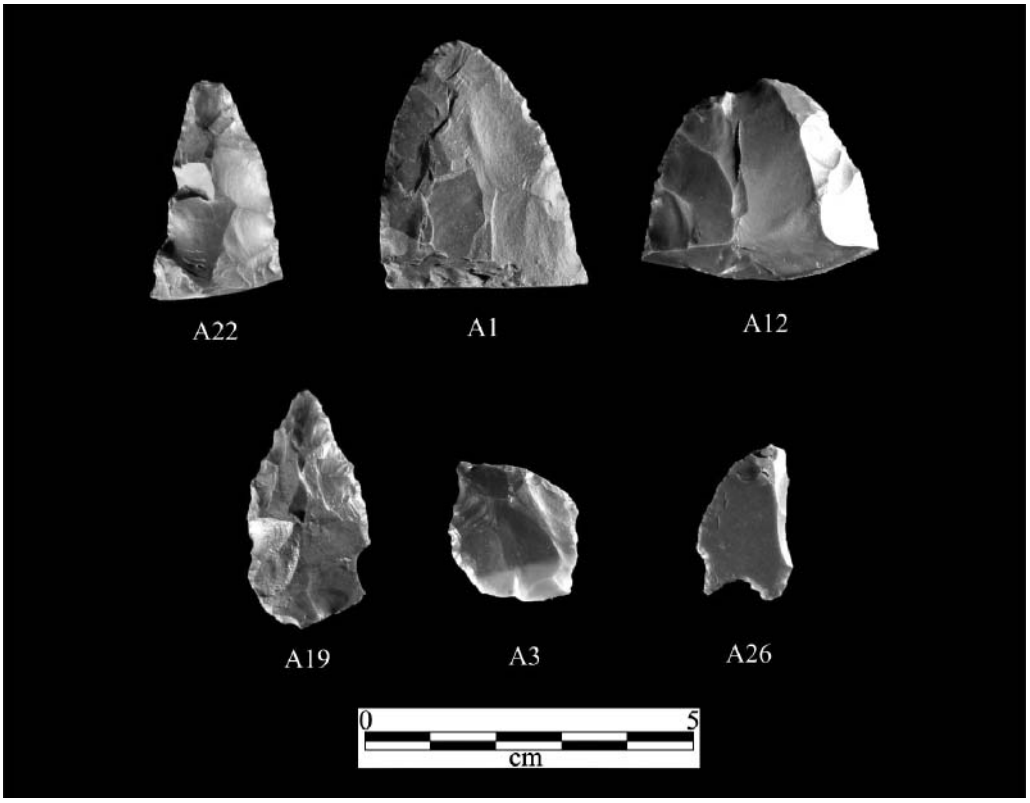


Figure 64. Surface-collected biface, unifacial preform, perforator, and gravers from the Diamondback site (41BS1482). Photo: E. Blecha.

of the ventral face. The toolstone is high-quality dark olive green chert.

Perforator (1 specimen)

Specimen A19 (Fig. 64): This small (27.4-mm-long [1.07 in]) pointed-ovate, leaf-shaped perforator has convex lateral and basal edges. It is bifacially worked; however, the ventral face is only worked on the basal edge. The distal tip exhibits steep unifacial beveling. It is made from yellowish-brown chert.

Gravers (2 specimens)

Specimen A3 (Fig. 64): This graver tool is made from a dark bluish-gray and tan banded chert flake with a hinge termination. The toolstone is likely from the northeastern Davis Mountains. The graver is situated on the corner of the hinge termination. Both the hinge termination and a convex lateral edge are beveled.

Specimen A26 (Fig. 64): The graver component on this yellowish-red chert flake is thinner than A3 and is also positioned on the corner of the termination. The distal end is worked into a deep concave U-shape. One lateral edge is strongly convex and beveled, and the other edge is missing. The graver bit is beveled on alternate edges.

End Scrapers (3 specimens)

Specimen A9 (Fig. 65): This small circular end scraper is bifacially worked, and one end is worked into an exaggerated slope to form a domed shape. On the ventral face, the bulb of percussion has been crudely thinned. This specimen is well made considering it is manufactured from a poor-quality mottled yellow, red, and white chalcedony flake.

Specimen A24 (Fig. 65): This ovate end scraper was made from a primary dark red chert flake. The flake was removed from the corner of a slab core and so the dorsal face consists of a steep off-center ridge line covered in cortex. The lateral edge is crudely worked and sinuous.

Specimen A27 (Fig. 65): This end scraper is circular and has one steeply beveled lateral edge and one denticulated edge. The tool is thick, with a large and prominent bulb of percussion and prepared platform. It is made from pinkish-tan fossiliferous chert.

Side Scraper (1 specimen)

Specimen A13 (Fig. 65): This side scraper is bifacially worked with one steeply beveled lateral edge. The specimen has slightly convex lateral edges and a slightly convex oblique distal end. The proximal end is missing. It is made from tannish-white opaque chalcedony.

Denticulate Flakes (2 specimens)

Specimen A11: This large (73 x 40 x 16.8 mm [2.9 x 1.6 x .66 in]) dark red andesite flake is bifacially worked on the distal blade edge into a denticulate tool. The denticulate component consists of four large saw-like teeth.

Specimen A14: Made from the same material as the side scraper (Specimen A13) described above, this small (14.9 x 21.7 x

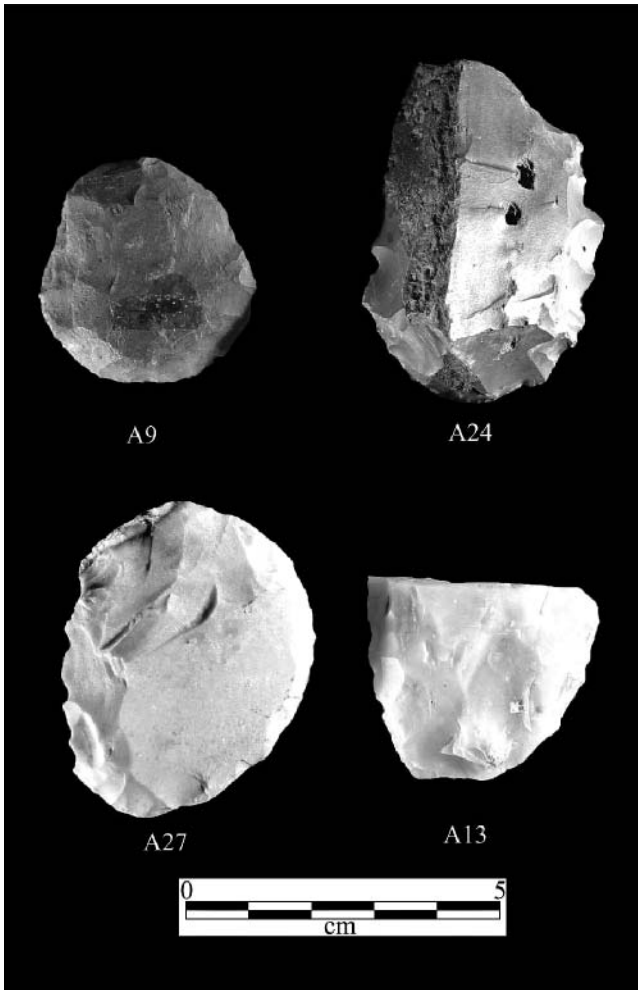


Figure 65. Surface-collected scrapers from the Diamondback site (41BS1482). Photo: E. Blecha.

4.8 mm [.6 x .9 x .2 in]) flake is wider than it is long and has a small prepared platform. The distal margin is denticulated with small saw-like teeth.

Utilized Flakes (3 specimens)

Specimen A5: This thick light grayish-tan chert flake is utilized and polished along its strongly convex lateral edge. The other end is partially fragmented and exhibits no use-wear. The striking platform is wide and covered in dark red cortex.

Specimen A18: The dorsal face of this secondary flake is covered in approximately 30 percent cortex. Rectangular in outline, this flake is made of light gray chert with black mottling and cortex. One lateral and a distal margin are utilized.

Specimen A20: This specimen was probably a blade; however, the proximal end is missing. It is made of light gray mottled chert with a hinge termination. One straight and thin lateral edge exhibits use-wear.

Flakes (3 specimens)

Specimen A15: This fragmented flake is made from a light grayish-tan chert flake.

Specimen A16: This tertiary flake is made of high-quality black chert. It has a slight curvature and is relatively thin (6.9 mm [.27 in] at the bulb of percussion). Both the distal and lateral margins may be utilized.

Specimen A25: This flake has convex lateral edges and a straight and wide distal edge. The toolstone is a porous, fine-grained volcanic rock.

Cores (2 specimens)

Specimen A17: This is a small (64.7 x 43.6 x 35.7 mm [2.5 x 1.7 x 1.4 in]), tabular, and multidirectional core tool. One end is rounded and crushed, suggesting its use as a hammer. Made from a dark red and golden banded chert cobble, the specimen is covered in cortex on one of its six faces.

Specimen A21: This angular, multidirectional core is comprised of white opaque chalcedony.

Hammerstone (1 specimen)

Specimen A7: This spherical hammerstone is made of low-quality purple and white mottled plume agate. It is worked into a sphere and the margins are wide and dull from use.

Green Cholla Site (41BS1483)

The Green Cholla site was discovered and recorded on June 17, 1996, by the SRSU field school team (Fig. 66). It is a prehistoric open site located ca. 700 m (2,297 ft) due south of the Elephant Mountain WMA headquarters. The campsite measures ca. 110 m (361 ft) N-S x 60 m (197 ft) E-W and is situated on a low gravel-capped terrace remnant, roughly 70 m (230 ft) west of Calamity Creek. The location is marked by a gentle rise above the surrounding floodplain. A short arroyo delineates a portion of the eastern boundary of the site. The arroyo is roughly 2–3 m (7–10 ft) deep and oriented north-south. Elephant Mountain, Crossen Mesa, and Cathedral Mountain are visible from the site.

On-site vegetation at the time of recording included honey mesquite (*Prosopis glandulosa*), cane cholla (*Cylindropuntia imbricate*), tarbush (*Flourensia cernua*), creosote bush (*Larrea tridentata*), tasajillo (*Cylindropuntia leptocaulis*), broomweed (*Gutierrezia sarothrae*), Russian thistle (*Salsola tragus*), and assorted grasses.

Fieldwork

The site was systematically recorded, and a mapping datum was placed within the central area of the site. Four features (all hearths) and 14 functionally and/or temporally diagnostic artifacts were located and plotted onto a site map using a theodolite and stadia rod. With the exception of two manos (A13 and A14) left on site, all artifacts were collected.

Features

Four hearths—two intact and two partially intact—were mapped and documented on the surface of the Green Cholla site. The features were oval to circular in shape and all approximated ca. 60 cm (24 in) in diameter. Three of the four hearths were in fairly close proximity. One hearth (F1) was located 30 m (98 ft) south of the hearth cluster. Fire-cracked igneous rock—with each rock averaging ca. 12 cm (5 in) in diameter—is present in every feature. Features F2, F3, and F4 were clustered in the north-central portion of the site. One hearth (F4) appeared to have associated lithic debitage,

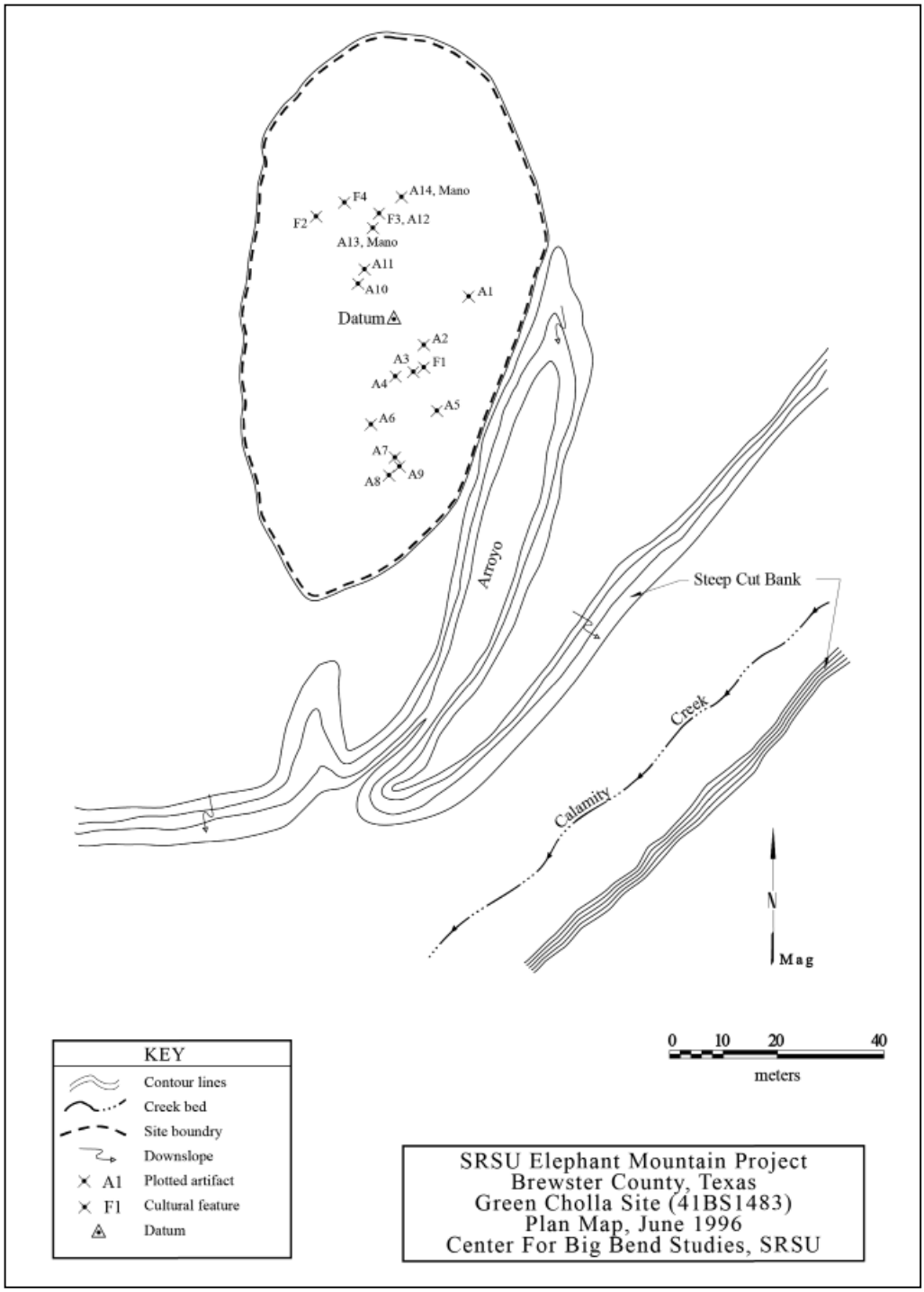


Figure 66. Plan map of the Green Cholla site (41BS1483). Drafting: D. Hart.

and a projectile point (A12) was recovered from the interior of Feature 3 (F3). Additional feature data is provided in Table 23.

Artifacts

A continuous lithic scatter consisting of debitage and a scatter of formal tools was present across the Green Cholla site. Raw stone types reflected by the debitage included high-quality agates, chalcedonies, cherts, jaspers, and felsites. Twelve of 14 temporally and/or functionally diagnostic artifacts encountered at the site were collected, and all were mapped. The two specimens not collected were manos (A13 and A14). Some of the formal tools were found across the southeastern portion of the site, but most were concentrated in the center of the site, on top of a gentle rise.

The collected artifacts include Late Prehistoric Alazan (n=1) and Fresno (n=1) arrow points, a diminutive Early to Middle Archaic Pandale (4000–2500 B.C.) dart point (n=1), untypable dart points (n=2), a dart point preform (n=1), a possible pendant preform (n=1), an end scraper fragment (n=1), a flake drill (n=1), a prismatic blade (n=1), and utilized flakes (n=2) (Fig 67). Arrow and dart projectile points recovered from the Green Cholla site indicate that occupations occurred during the Late Archaic (1000 B.C.–A.D. 700) and Late Prehistoric (A.D. 700–1535) periods. A more detailed breakdown of the collected artifacts from 41BS1483 is provided in Table 24.

Pandale Dart Point (1 specimen)

Specimen A7 (Fig. 67): This diminutive Pandale dart point has heavily reworked blade edges; one blade margin is convex while the other is recurved. The blade element is offset and is as long as the slightly expanding stem—although the stem is hard to discern as the specimen has no shoulders. The basal edge is convex and almost as wide as the blade edges. The specimen is poorly made and manufactured from white chert.

Untyped Dart Points (2 specimens)

Specimen A9 (Fig. 67): This specimen is heavily reworked and made from white chert. It is triangular with a convex basal edge. The lateral margins are straight, and the distal tip is rounded and slightly offset. The size of the specimen (22.8 x 17.9 mm [.9 x .7 in]) suggests that it is a reworked dart point blade.

Table 23: Cultural features documented at the Green Cholla site (41BS1483)

Feature #	Type	Shape	Dimensions (cm)	Condition	% of Intactness
1	Hearth	Oval	47 x 60	Intact	90
2	Hearth	Circular	60	Partially Intact	n/a
3	Hearth	Circular	58	Intact	90
4	Hearth	Oval	80 x 65	Partially Intact	80

n/a = not addressed in field notes

Table 24: Surface-collected artifacts from the Green Cholla site (41BS1483)

Spec No.	Type	Description	Material	Collected Yes/No	Max Length (mm)	Max Width (mm)	Max Thick. (mm)
1	Bifacial Preform	Pendant?	Chert	Yes	25.6	19.3	4.5
2	Dart Point Preform	Complete; Sinuous Edges	Felsite	Yes	60.2	30.4	12.8
3	Blade	Micro Blade	Jasper	Yes	34.2	10.3	5.2
4	Utilized Flake	Fragmented	Plume Agate	Yes	20.6	21	5.6
5	Alazan Arrow Point?	Reworked Blade	Chert	Yes	–	15.8	4.1
6	Flake Drill	Medial Fragment	Chert	Yes	–	–	2.6
7	Pandale Dart Point	Diminutive; Reworked Blade	Chert	Yes	32.8	14.2	5.1
8	End Scraper	Distal Fragment; Use-wear	Chert	Yes	–	40	12.4
9	Untypable Dart Point	Heavily Reworked	Chert	Yes	22.8	17.9	5.4
10	Utilized Flake	Fragmented	Chert	Yes	–	29.9	5.2
11	Untypable Dart Point	Proximal Fragment; Utilized	Chert	Yes	–	25.2	5.6
12	Fresno Arrow Point	Missing Distal Tip	Chert	Yes	–	11.6	3.2
13	Mano	n/a	n/a	No	–	–	–
14	Mano	n/a	n/a	No	–	–	–

n/a = not addressed in field notes

Specimen A11 (Fig. 67): This specimen is the stem of a large dart point. The specimen has one slightly contracting and one slightly expanding lateral stem margin. The basal edge is convex with a wide and moderately deep concavity—creating two large rounded basal ears. The specimen displays a hinge fracture along the medial portion of the blade element. A portion of this hinge fracture has been utilized. The toolstone is pinkish-gray chert.

Alazan Arrow Point (1 specimen)

Specimen A5 (Fig. 67): This is likely an Alazan arrow point. It has a reworked short and wide triangular blade element with a short and wide expanding stem. The basal edge is concave with round basal ears. One shoulder is missing; however, the other is very strong and creates a 90-degree angle with the neck of the stem. The specimen is made from mottled light gray and pink chert.

Fresno Arrow Point (1 specimen)

Specimen A12 (Fig. 67): This specimen has a long blade element that is narrower than the stem or hafting element. The basal edge is slightly convex with squared basal corners and lateral stem edges that taper slightly towards the blade edges. The specimen is made from pinkish-tan chert and is missing the distal tip.

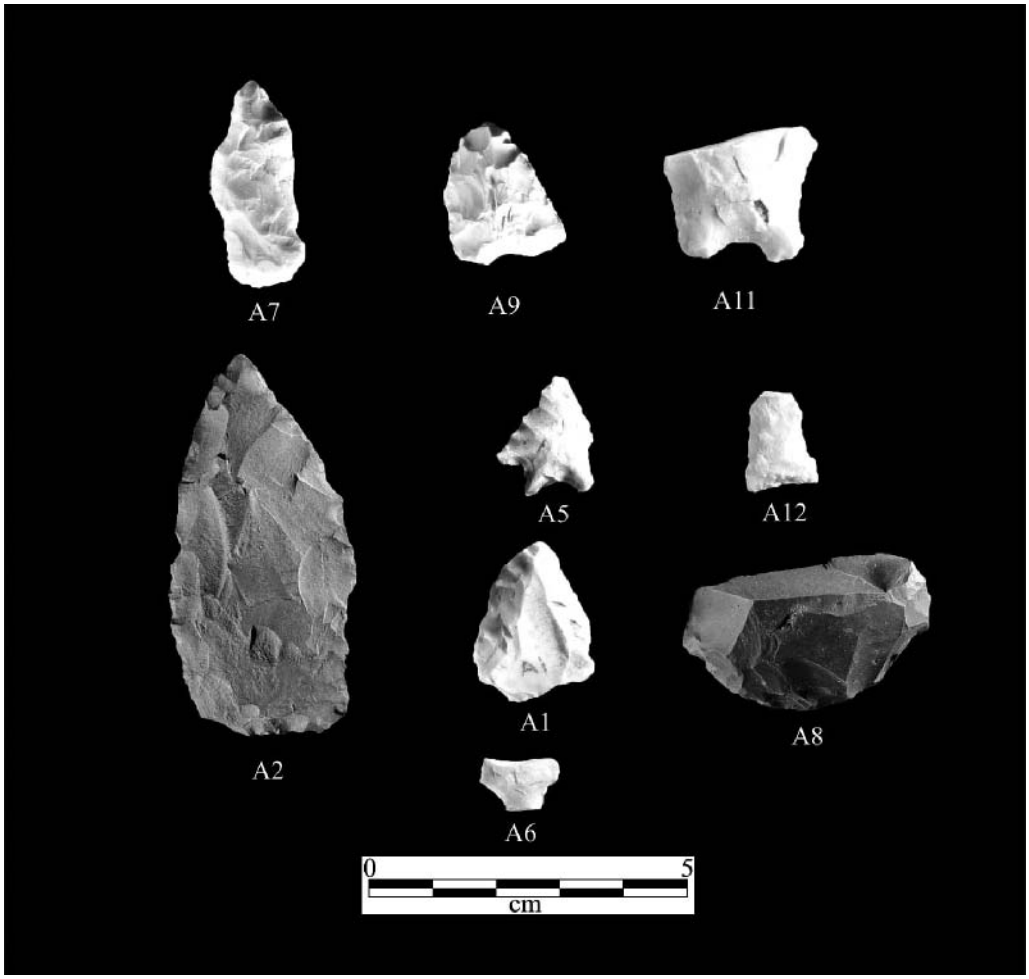


Figure 67. Surface-collected artifacts from the Green Cholla site (41BS1483). Photo: E. Blecha.

Dart Preform (1 specimen)

Specimen A2 (Fig. 67): This biface is pointed-ovate with a straight basal edge and rounded basal corners. The lateral blade edges are slightly-to-moderately convex. It is thickest in the center with "knots" on both faces and sinuous, unretouched edges. This specimen was likely a dart point preform that could not be adequately thinned. The specimen is made from dark green felsite.

Bifacial Preform (1 specimen)

Specimen A1 (Fig. 67): This small triangular biface is likely a preform for a bead or a pendent. The basal edge is irregularly convex and steeply beveled. The lateral blade edges are convex as well, and there is a slight protuberance on the basal corner. Though bifacially worked, the smooth ventral face and remnant flake scares are discernible. The specimen is made from pink banded chert.

End Scraper (1 specimen)

Specimen A8 (Fig. 67): This end scraper is fragmented, and what remains is a convex margin and working distal end. This margin is unifacially worked into a domed shape and is beveled along the worn and polished bit end. It is manufactured from dark green chert.

Flake Drill (1 specimen)

Specimen A6 (Fig. 67): This medial flake drill fragment is missing the proximal end of the flake and the distal end of the drill bit. The portion of the drill bit that remains exhibits alternate beveling. A portion of the ventral face is unworked. The specimen is made from pink and yellowish-tan chert.

Blade (1 specimen)

Specimen A3: This micro blade is long and narrow (34.2 x 10.3 mm [1.3 x .4 in]) with a prominent medial arris. The striking platform is small and prepared. The toolstone is golden jasper.

Utilized Flakes (2 specimens)

Specimen A4: This utilized flake has one straight and one strongly convex lateral margin and is missing the distal end. The convex margin shows evidence of utilization. The toolstone is mottled purple plume agate.

Specimen A10: This is the proximal end of a utilized flake made of gold and red mottled chert. The specimen exhibits use-wear along both edges.

J. B. McHam Site (41BS1484)*

***Note to Reader: The J.B. McHam site was discovered on June 19, 1996, by the SRSU field school team. The site and a significant feature found therein—the McHam Cache—have been published previously in Archaeological Explorations of the Eastern Trans-Pecos and Big Bend: Collected Papers, Volume 1. Much of what follows is excerpted from that publication. For a detailed description and discussion of the McHam Cache, and its implications for Eastern Trans-Pecos/Big Bend research, please see Mallouf (2013:115–152).**

Located near the southwestern tip of Elephant Mountain, this extensive open site is situated on a level-to-undulating alluvial terrace that fronts on the east side of Calamity Creek (Fig. 68). Comprising one of the larger archaeological sites thus far documented in the Elephant Mountain area, cultural deposits here extend from the edge of the creek eastward over 250 m (820 ft) to a well-elevated, boulder-strewn colluvial bench that delimits the base of the mountain. The long axis of the site parallels the creek, trending northwest to southeast for a distance of some 350 m (1,148 ft) (Mallouf 2013:122–123) (Fig. 69).

The surface of the McHam site slopes gently downward to the southwest and is incised by two very shallow erosional rills that drain to the west and southwest, respectively. The eastern half of the terrace is made up of inter-graded alluvial and colluvial sediments with a respectable gravel

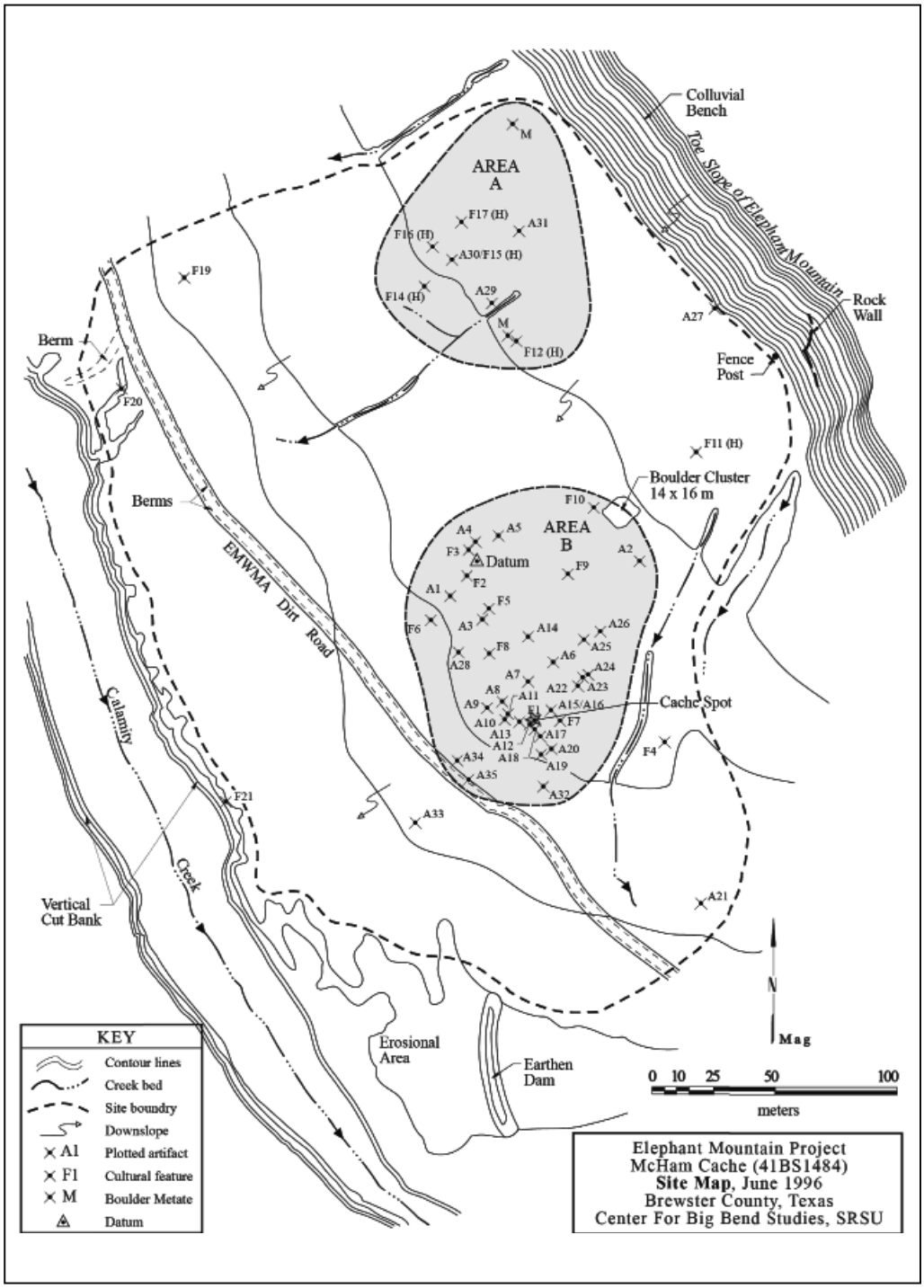


Figure 68. Plan map of the J.B. McHam site (41BS1484). Drafting: D. Hart.

Figure 69. View WSW across the McHam site (41BS1484). Tree line marks Calamity Creek. Photo: R. Mallouf.

content, while the western half is primarily silty sand alluvium with some clay and minor gravel content. A two-track road crosses the site from northwest to southeast, and a small earthen dam is present at the south edge of the site. A few small berms are constructed in the area to retard erosion due to sheetwash. Interestingly, the McHam site lies on a direct compass line from Cathedral Peak, visible to the north-northeast, to Santiago Peak, which is prominent to the south-southeast (Mallouf 2013:123). Vegetative cover at the site was dominated by creosote bush (*Larrea tridentata*), grasses, low-growth honey mesquite (*Prosopis glandulosa*), scattered yucca (*Yucca* sp.), catclaw (*Acacia greggii*), whitethorn acacia (*Acacia constricta*), ocotillo (*Fouquieria splendens*), allthorn (*Castela erecta texana*), tasajillo (*Cylindropuntia leptocaulis*), pitaya (*Echinocereus enneacanthus*), eagle's claw (*Echinocatus horizonthalonius*), cane cholla (*Cylindropuntia imbricate*), and prickly pear (*Opuntia* sp.).

Fieldwork

The McHam site was surveyed, mapped, and documented over a three-day period, from June 19 to June 21, 1996. The crew conducted controlled surface-collecting in conjunction with mapping. A datum was placed in roughly the center of the site, in the northern portion of Area B. The site—including the site boundaries, 21 features, and 35 diagnostic/formal surface artifacts—was mapped using a theodolite and stadia rod. The 35 lithic artifacts were collected

from the surface of the site (not including cache artifacts—see below). Surface examination indicated that two major artifact and feature concentrations were present on the site—one in the north, Area A, and one in the south-center of the site, Area B (Mallouf 2013:124–125).

On June 19, 1996, J.B. McHam, the student for whom the site was named, discovered a lithic biface cache (F1) while examining the site with the field school director and several other students (Fig. 70). Fourteen of the cache bifaces had been exposed by sheet erosion and were clustered together in a 50 x 80 cm (20 x 31 in) area on the ground surface. Having placed a 1 x 1 m (3 x 3 ft) excavation unit over the cache spot, the locations of all surface-exposed specimens in the feature were mapped to scale and left *in situ* pending excavation (Fig. 71). A major goal of the cache excavation was to expose, in place, any remaining cache specimens so that the entire *in situ* feature could be photographed and drawn to scale. Additionally, every effort would be made to explore any adjacent cultural deposits that might shed light on the age and/or cultural affiliation of the cache. The excavation unit was oriented N-S and was carefully placed to encompass all exposed specimens, as well as cache specimens that might be present but buried beneath the ground surface. A datum and instrument station were established outside of the unit for vertical control (Mallouf 2013:128).

Figure 70. McHam site (41BS1484). Cache bifaces exposed on the surface in an arched configuration. Additional specimens were located below the surface. Photo: R. Mallouf.

Figure 71. Students preparing a 1 x 1 m (3 x 3 ft) excavation unit over the McHam Cache. Photo: R. Mallouf.

All vegetation was carefully removed from within the unit, and excavation commenced using paint brushes and trowels. The entire unit was initially brushed down, resulting in the discovery of 3 additional *in situ* cache bifaces immediately south of the cache cluster, thus bringing the total number of bifaces in the cache to 17. Four small pieces of *in situ* debitage were also exposed by brushing the periphery of the cache spot (D1 to D4). Believed to be unrelated to the cache, these consist of two flakes of variegated chalcedony, a tiny chert pot-lid, and a small yellowish-brown piece of shatter from a core (Mallouf 2013:128).

On June 21, 1996, as work at the McHam site was nearing completion, the crew tested an oval-shaped dirt and rock mound in the southeast area of the site that was thought to be a possible burial feature (F4). A 40 x 150 cm (16 x 59 in) trench, oriented northwest to southeast, was placed in the middle of the mound, roughly bisecting the feature. All material from the test trench was screened through a one-eighth-inch mesh screen. The feature proved to be culturally sterile and was determined to be a twentieth century eroded bulldozer push-pile.

Features

As noted earlier, 21 features were recorded on the McHam site in June 1996. They consisted of 16 hearths or hearth groupings, 2 boulder metates (F13 and F18), 1 mounded feature (F4), 1 knapping station (F2), 1 cache (F1, discussed above), and 1 possible

historic structure (F21). In terms of condition, the hearth features ranged from partially intact to scattered, originally averaged ca. 90–100 cm (35–39 in) in diameter and were comprised of hand-sized fire-cracked rock. F6 consisted of two coalesced hearths, and F20 was a hearth located 10–20 cm (4–8 in) below the surface in the cutbank of Calamity Creek at the northwest corner of the site.

Both boulder metates (F13 and F18) along with five hearths (F12, F14, F15, F16, and F17) were located in the northeast corner (Area A) of the site. The boulder metates were likely *in situ* due to their size and weight. Feature 18 was a hearth with fire-cracked rock and a few pieces of debitage. A historic feature (F21) was located in the eastern cutbank of Calamity Creek approximately 125 m (410 ft) southwest of the site datum. Cut by flood waters, this D-shaped feature consisted of a large cobble- and gravel-filled pit (Mallouf 2013:124–125).

The south-central area, termed Area B, contained seven hearths (F3, F5, F6, F7, F9, F8, and F10), a discernible flintknapping workstation (F2), and the biface cache (F1) (Figs. 72 and 73). Four of the seven hearths (F3, F5, F7 and F8), along with the lithic cache (F1), are configured in a roughly linear north-south pattern along the western side of Area B. A perceived pattern in the spacing of some of

Figure 72. Feature 3 at the McHam site (41BS1484). Photo: R. Mallouf.

Figure 73. Feature 10 at the McHam site (41BS1484). Photo: R. Mallouf.

the hearths within the respective areas may reflect contemporaneous use. The knapping workstation (F2) was located approximately 7 m (23 ft) south of the mapping datum, and consisted of 19 flakes of opaque tan agate and 3 cores in a 1.9 x 0.9 m (6 x 3 ft) area (Mallouf 2013:124–125 and Fig. 6).

The McHam Biface Cache

The McHam biface cache (F1) was discovered at the south end of Area B, roughly 38 m (125 ft) east of a two-track road. The cache was placed in a virtually flat, nondescript area of the terrace surface. There was only minimal evidence suggesting that a cairn or natural feature ever existed in the immediate vicinity that could have aided the maker in relocating his/her stash. Exposed by sheet erosion, 14 cache specimens were lying in a tight, linear arrangement with a slightly curved overall configuration. Although scattered somewhat by sheet erosion, 11 of the 14 exposed specimens were still in contact with at least one other specimen, unequivocal evidence that in-place cache specimens had originally been stacked together, probably in a very shallow, basin-shaped pit. Excavation of the cache spot yielded three additional specimens, bringing the full cache assemblage (n=17) to 15 bifaces and 2 large flakes, all manufactured from gray limestone chert. For a detailed account of the McHam Cache discovery, analysis of the cache assemblage, and discussion of prehistoric caching behaviors in the Big Bend, see Mallouf (2013:115–152). For additional data on other features documented at the site, see Table 25.

Artifacts

As discussed earlier, the McHam site has two artifact and feature concentrations—a northeast cluster termed Area A, and a south-central cluster termed Area B. Area A yielded a reworked Late Archaic Shumla (1300–200 B.C.) dart point (A31; Fig. 74), an end scraper fashioned on a prismatic blade (A29; Fig. 77), and the umbo from a large freshwater mussel shell (A30). The debitage occurring in Area A is much more thinly scattered than in the nearby south-central artifact cluster (Area B) of the site.

Area B contained the densest scatter of cultural material at the McHam site. The 21 pieces of variegated chert debitage and cores that constituted the Feature 2 lithic workshop were collected, and a number of these knapping discards could be refitted. Twelve projectile points—7 arrow points and 5 dart points—were also recovered from Area B. These included two Late Prehistoric Cliffton arrow points (A3, A34; Fig. 75), one Late Archaic Ensor (200 B.C.–A.D. 1000) dart point (A4; Fig. 74), a Late Archaic Paisano dart point (A7; Fig. 74), and an Early to Middle Archaic (6000–4000 B.C.) Arenosa dart point (A23; Fig. 74). Also recovered from the south half of Area B were five thin bifacial preforms and a fragmentary beveled knife (A35; Fig. 76), the latter from the edge of the two-track road (Mallouf 2013:125).

Based on intra-site patterning of features and artifacts, as well as artifact styles, the two material clusters found in Areas A and B at the McHam site would seem to

Table 25: Documented cultural features at the McHam site (41BS1484)

Feature #	Type	Shape	Dimensions (cm)	Condition	% of Intactness
1	Cache	Crescent	80 x 84	Scattered	n/a
2	Knapping Station	Oval	n/a	n/a	n/a
3	Hearth	Oval	130 x 95	Partially Intact	80
4	Possible Burial	Long Oval	230 x 450	Intact	90
5	Hearth	Oval	45 x 40	Partially Intact	75
6	Cluster of 2 Hearths	Oval	130 x 250	Partially Intact	80
7	Hearth	R. Oval	n/a	Scattered	15
8	Hearth	Oval	75	Scattered	10
9	Hearth	Oval	120 x 100	Partially Intact	80
10	Hearth	Oval	127 x 85	Scattered	25
11	Hearth	Oval	100 x 80	Partially Intact	85
12	Hearth	Oval	90	Partially Intact	35
13	Metate	Rectangular	45 x 35 x 20	Intact	100
14	Hearth	Oval	80 x 90	Scattered	n/a
15	Hearth	Circular	60 x 80	Partially Intact	90
16	Hearth	Oval	90 x 80	Partially Intact	65
17	Hearth			Scattered	5
18	Metate	Pear	82 x 60 x 8	Intact	100
19	Hearth/s	Two Ovals	150 x 100; 120 x 90	Partially Intact	20
20	Hearth (cutbank)	Oval	n/a	Partially Intact	n/a
21	Historic Unknown	D-Shaped	n/a	Partially Intact	n/a

n/a = not addressed in field notes; R = roughly

reflect separate and distinct occupations during the Late Archaic (1000 B.C.–A.D. 700) period. Little can be inferred concerning Late Prehistoric occupations at the present time.

The biface cache (F1) from Area B of the site was comprised of 17 specimens (15 bifaces and 2 flakes), all of gray limestone chert that is believed to have originated from the Del Norte Mountains a short distance to the east of Elephant Mountain. The reader is referred to Mallouf (2013) for detailed descriptions of the cache specimens. More complete descriptions of the 35 general surface artifacts collected from across the McHam site are provided below in Table 26.

Arenosa Dart Point (1 specimen)

Specimen A23 (Fig. 74): This specimen is the proximal (stem) fragment of a Middle Archaic Arenosa dart point made from black and dark reddish-brown chert. The stem is contracting with a narrow convex basal edge. The lateral edges of the stem are moderately convex.

Ensor Dart Point (1 specimen)

Specimen A4 (Fig. 74): The slightly concave basal edge of this Ensor dart point is the widest part of this specimen. Made from mottled pink and gray chert, the specimen has shallow and wide side notches with one rounded and one squared basal ear. The blade edges are convex, and one blade edge has a large U-shaped notch present just above the stem. The distal tip is missing, and the specimen has likely been heat treated.

Paisano Dart Point (1 specimen)

Specimen A7 (Fig. 74): This Paisano dart point has moderately convex lateral blade edges and a slightly expanding stem with extremely shallow side notches. The basal edge is moderately convex with rounded basal corners. The specimen is made from yellowish-brown jasper and is missing the distal tip and a basal corner.

Shumla Dart Point (1 specimen)

Specimen A31 (Fig. 74): This specimen has a slightly contracting stem with a wide convex basal edge and small reworked barbs. The distal blade is missing; however, the remaining blade edges are strongly serrated. The specimen is made from white and tan banded chert and is plano-convex in cross section. The basal edge is thinned, and a "knot" is present in the center of the stem.

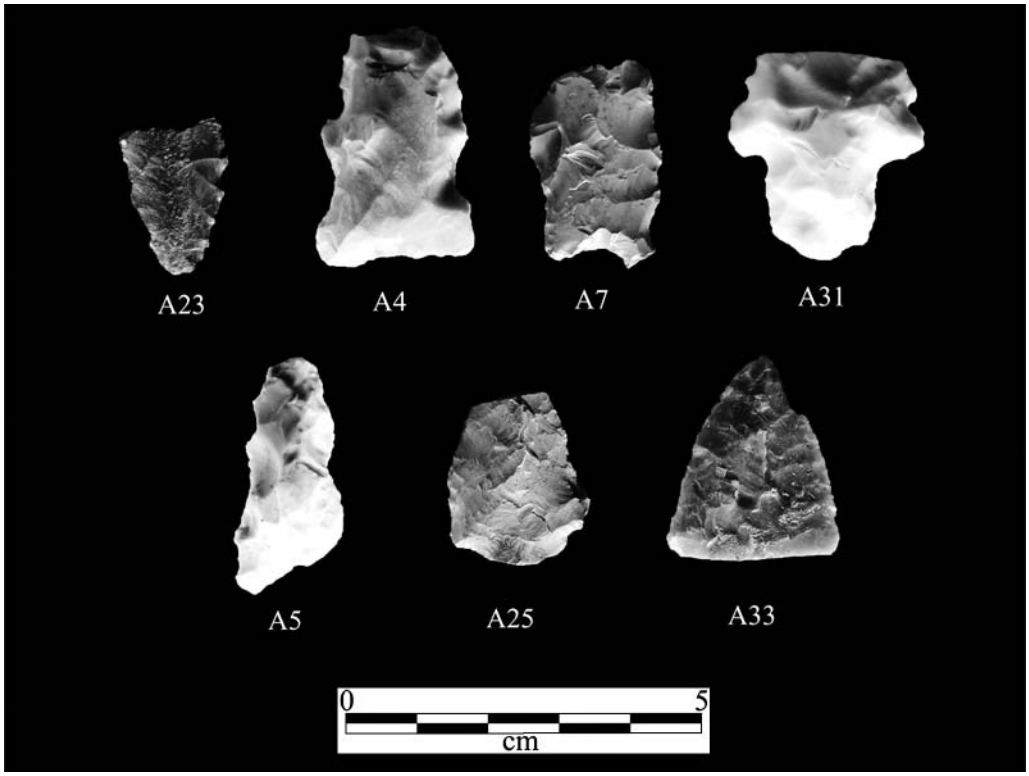


Figure 74. Surface-collected dart points from the McHam site (41BS1484). Photo: E. Blecha.

Table 26: Recovered surface artifacts from the J.B. McHam site (41BS1484)

Spec No.	Type	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
1	Untyped Arrow Point	Chert	–	14.6	5	–
2	Untyped Arrow Point	Chert	–	16.3	3.1	9.6
3	Cliffton Arrow Point	Chert	–	20.5	4.1	10.5
4	Ensor Dart Point	Chert	–	22.6	6.8	17.1
5	Untyped Dart Point	Chert	33.6	15.6	6.6	–
6	Side and End Scraper	Claystone	48.5	30.6	13.3	–
7	Paisano Dart Point	Jasper	–	18.7	6.4	–
8	Untyped Arrow Point	Chert	–	12.2	2	5.1
9	Scraper	Jasper	35.2	33.2	10.4	–
10	Biface Thinning Flake	Chert	43.2	25.9	6.4	–
11	Arrow Preform	Felsite	–	21.6	3.6	–
12	Thin Biface	Chert	–	32.9	5.7	–
13	Preform	Chert	–	–	–	–
14	Thin Biface	Chert	–	24.9	6.1	–
15	Untyped Arrow Point	Chert	33.8	–	4.8	5.4
16	Thin Biface	Chert	–	24.9	7.5	–
17	Alazan Arrow Point	Chert	–	11.6	3.7	6.2
18	Flake	Chert	35.7	29.5	8.7	–
19	Drill	Chalcedony	–	–	2.8	6.5
20	Dart Preform	Chert	36.7	26.3	8.3	–
21	End Scraper	Felsite	88.3	66.7	25.2	–
22	Drill	Jasper	22.3	13.5	3.9	5
23	Arenosa Dart Point	Chert	–	14.8	5.2	–
24	Blade	Plume Agate	47.2	25.6	11.5	–
25	Untyped Dart Point	Jasper	–	20.3	6.6	12.5
26	Dart Preform	Chert	–	26.4	9.6	–
27	Dart Preform	Chert	–	22.9	5.7	–
28	Blade	Chert	36.5	20.6	6.5	–
29	Side and End Scraper	Chert	53.1	31.6	11.6	–
30	Mussel Shell	Shell	–	–	–	–
31	Shumla Dart Point	Chert	–	27.8	6.8	16.2
32	Alazan Arrow Point	Novaculite	25	18.5	3.4	7
33	Untyped Dart Point	Chert	–	24.3	5.3	–
34	Cliffton Arrow Point	Chert	–	16.1	3.8	9.5
35	Bifacial Knife	Jasper	55.5	17	8.3	–

Untyped Dart Points (3 specimens)

Specimen A5 (Fig. 74): This dart point is reworked and poorly made. The stem is straight and wider than the blade element with rounded basal ears and a convex, deeply indented basal edge. One of the basal ears is missing. The blade element is narrow with slightly concave, reworked blade edges. The specimen is made from heat-treated, pinkish-white chert.

Specimen A25 (Fig. 74): This is the medial segment of a dark yellow jasper dart point that was modified into a drill. The lateral blade edges are slightly convex on one side and concave on the other. The specimen is corner notched and missing the barbs/shoulders, stem, and distal tip.

Specimen A33 (Fig. 74): Made from dark gray chert, this distal dart point fragment is well made and thinned. The lateral blade edges are slightly convex and lenticular in cross section. The fracture on the distal tip resembles a burin facet.

Alazan Arrow Points (2 specimens)

Specimen A17 (Fig. 75): This Alazan point is side notched with a short expanding stem. The basal edge is convex, and the shoulders have a downward slope. The blade edges are slightly convex and serrated. The specimen is made from white and pink mottled chert, and the distal tip is missing.

Specimen A32 (Fig. 75): This specimen, made from white novaculite, has an off-set blade. One blade edge is slightly concave, and the other is moderately convex. The stem has one straight lateral edge and one slightly expanding with a convex basal edge. The specimen is corner notched with prominent shoulders.

Cliffton Arrow Points (2 specimens)

Specimen A3 (Fig. 75): This Cliffton arrow point has a bulbous-to-contracting stem with convex lateral stem edges that meet at a V-shaped point at the basal end. One shoulder is strong and extends laterally at the neck; the other is reworked, rounded, and down-sloping. The specimen is bifacially worked and made from purple chert. It is thickest at the center of the stem.

Specimen A34 (Fig. 75): Made from bluish-gray chert, this specimen has straight-to-slightly convex blade edges and a contracting stem. It is bifacially worked on the stem, and a remnant parent flake scar is present on a face of the blade element. The specimen exhibits steep beveling along one lateral blade edge and one shoulder is reworked, rounded, and weak. The opposing shoulder is moderate and pointed.

Untyped Arrow Points (4 specimens)

Specimen A1 (Fig. 75): Made of light gray chert, this specimen has moderate-to-extreme convex lateral blade edges and strong shoulders. This specimen is worked bifacially but is poorly thinned. The extreme distal tip is the thinnest portion of the specimen, while the center of the distal blade (top one-third of the blade) is the thickest—resulting in a dome-shaped profile. The specimen is missing the stem.

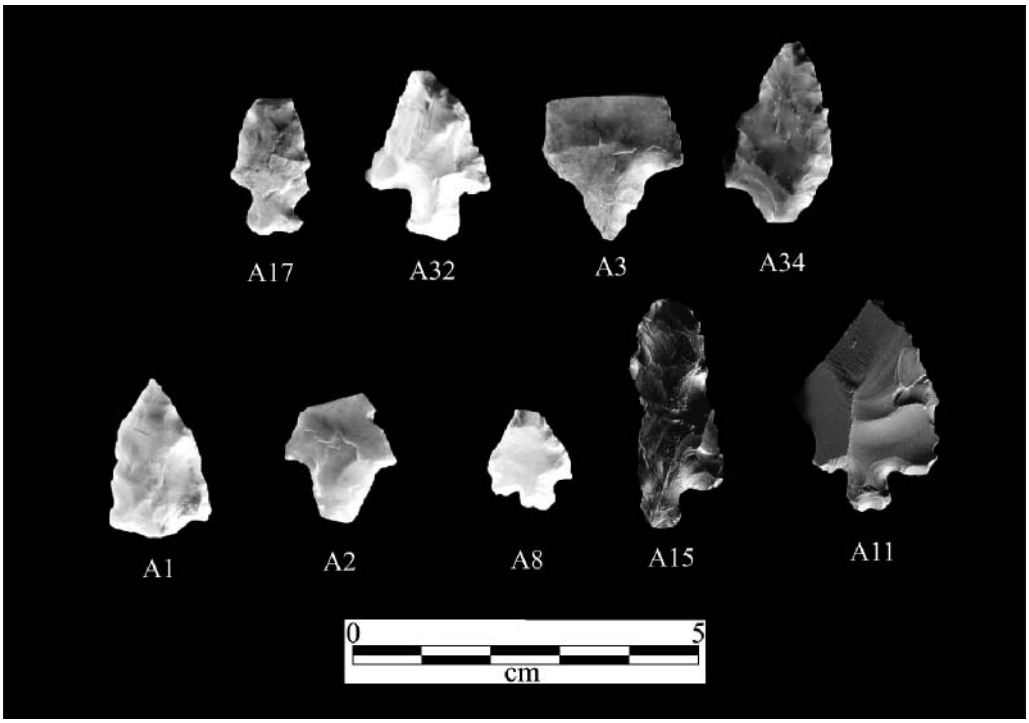


Figure 75. Surface-collected arrow points from the McHam site (41BS1484). Photo: E. Blecha.

Specimen A2 (Fig. 75): This point has straight lateral blade edges and strong laterally extended shoulders. The stem has a wide neck that contracts to a narrow and straight basal edge. Made of mottled gray chert, the specimen is thin and bifacially worked. A remnant parent flake scar is present on a blade face, and the distal blade tip is missing. This specimen is morphologically similar to Perdiz and Cliffton arrow point styles.

Specimen A8 (Fig. 75): The smallest of the arrow points from this site, this specimen has a convex blade edge (one is missing), strong lateral shoulders, and a short parallel-sided stem. The basal edge is irregularly convex. The specimen is bifacially worked along its margins—while the blade faces are unworked. The toolstone is white chert.

Specimen A15 (Fig. 75): This specimen has a long triangular blade with straight lateral blade edges. The stem is short and narrow compared to the blade element and is slightly expanding. The basal edge is convex, and the shoulders are very strong. The specimen is bifacially worked and is made from black Maravillas chert.

Dart Preforms (3 specimens)

Specimen A20 (Fig. 76): The distal fragment of a probable dart preform, this specimen exhibits use-wear along its proximal, hinge-fractured margin. The corner of the fracture is modified as well. The lateral blade

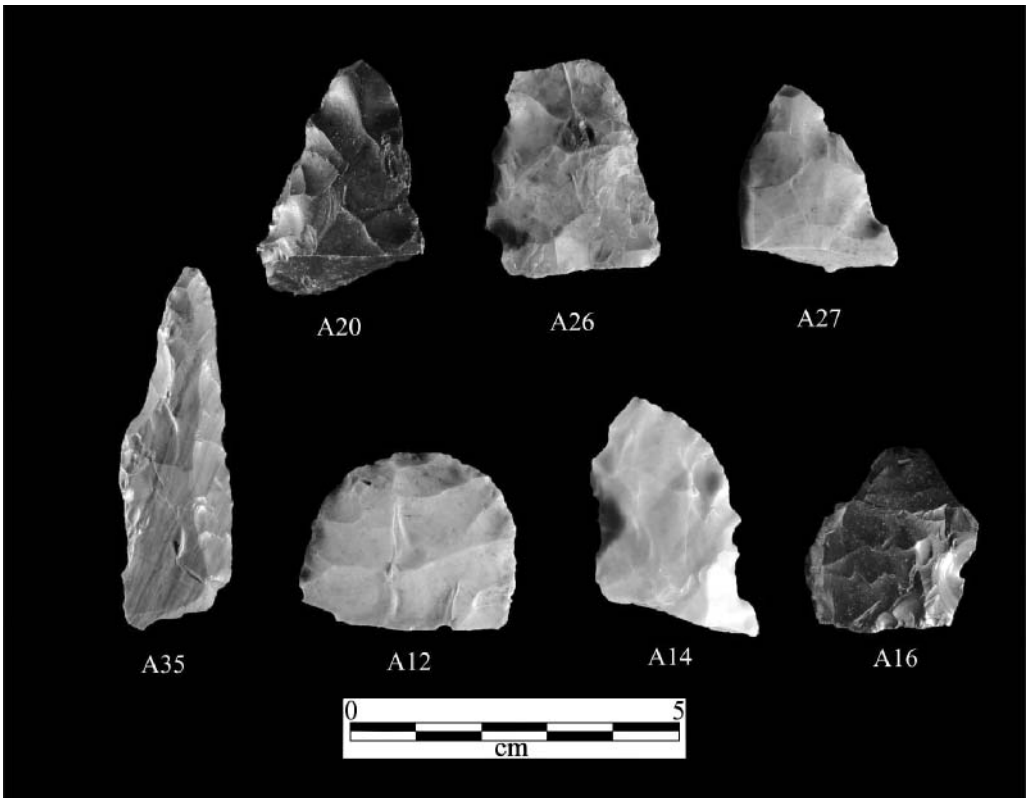


Figure 76. Surface-collected bifaces from the J.B. McHam site (41BS1484). Photo: E. Blecha.

edges are straight, and the specimen is made from black chert that is likely heat treated.

Specimen A26 (Fig 76): This is a triangular dart point preform. Made from mottled gold chert, this specimen has two straight blade edges and a straight basal edge. One corner is shallowly notched to form a weak shoulder. The distal tip is missing, and the specimen is not well-thinned. One blade edge exhibits a "knot" where the toolstone proved too difficult to thin.

Specimen A27 (Fig. 76): Made from mottled gray chert, this proximal fragment of a likely Almagre dart point preform has moderately and slightly convex blade edges. The specimen is not well thinned and has sinuous edges.

Arrow Preform (1 specimen)

Specimen A11 (Fig. 75): Specimen A11 is likely an Alazan arrow point preform with a leaf-shaped blade element having convex lateral blade edges. The stem is narrow compared to the blade element and has one straight and one expanding lateral stem edge. The basal edge is convex with a small indent in the middle. The shoulders are strong and protrude laterally from the neck of the stem. The lateral blade edges are serrated and exhibit strong beveling on the

ventral face. The specimen is made from reddish-brown fine-grained felsite and is bifacially worked on the stem and corner notches.

Bifacial Knife (1 specimen)

Specimen A35 (Fig. 76): Specimen A35 is a long lanceolate bifacial knife with one straight and one convex blade edge. The blade has been heavily reworked and exhibits strong alternate beveling. This specimen is uniformly thick, and a portion of the basal edge is missing. Manufactured from yellow and brown banded jasper, this is likely a depleted and discarded tool.

Thin Bifaces (3 specimens)

Specimen A12 (Fig. 76): Specimen A12 is a round and wide distal fragment of a probable ovate biface. The specimen is well-thinned on both faces and is made of yellowish-tan and purple chert, possibly from the Purple-Tan Quarries near Michigan Draw in Culberson County.

Specimen A14 (Fig. 76): This distal biface fragment has an off-set blade with one convex and one oblique blade edge. The convex blade edge is denticulated along the proximal end. Plano-convex in cross section, this specimen is only minimally worked on the ventral face along the blade margin. The toolstone is gray banded chert.

Specimen A16 (Fig. 76): This highly fragmented black chert biface is worked carefully on one face and expediently on the other. The specimen exhibits four breaks, three of which are hinge fractures along its margins. All of the fractured margins exhibit use-wear.

Drills (3 specimens)

Specimen A19 (Fig. 77): Specimen A19 is a drill manufactured from a spent arrow point. It has one concave and one moderately convex blade edge. The stem and one barb are missing but the existing barb is strong and pointed. The specimen is made from red and white banded chert and exhibits strong alternate beveling on the distal tip or bit end.

Specimen A22 (Fig. 77): Made from dark red jasper, this drill was manufactured from a spent arrow point and is morphologically similar to specimen A19. The stem is extremely short and likely reworked. The specimen also has one reworked shoulder and one moderate barb. The blade edges are straight and serrated with a strong left-hand alternate beveling along the distal blade edge or bit end.

End Scraper (1 specimen)

Specimen A21 (Fig. 77): The largest of the scrapers, this specimen is long and ovate, and the distal end is steeply beveled, resulting in a domed shape in cross section. A large thinning flake on the dorsal face made this specimen completely flat. Cortex is present on the dorsal face and lateral margin. The specimen is made of dark brown fine-grained felsite.

Side and End Scrapers (2 specimens)

Specimen A6 (Fig. 77): This ovoid side and end scraper has convex lateral edges.

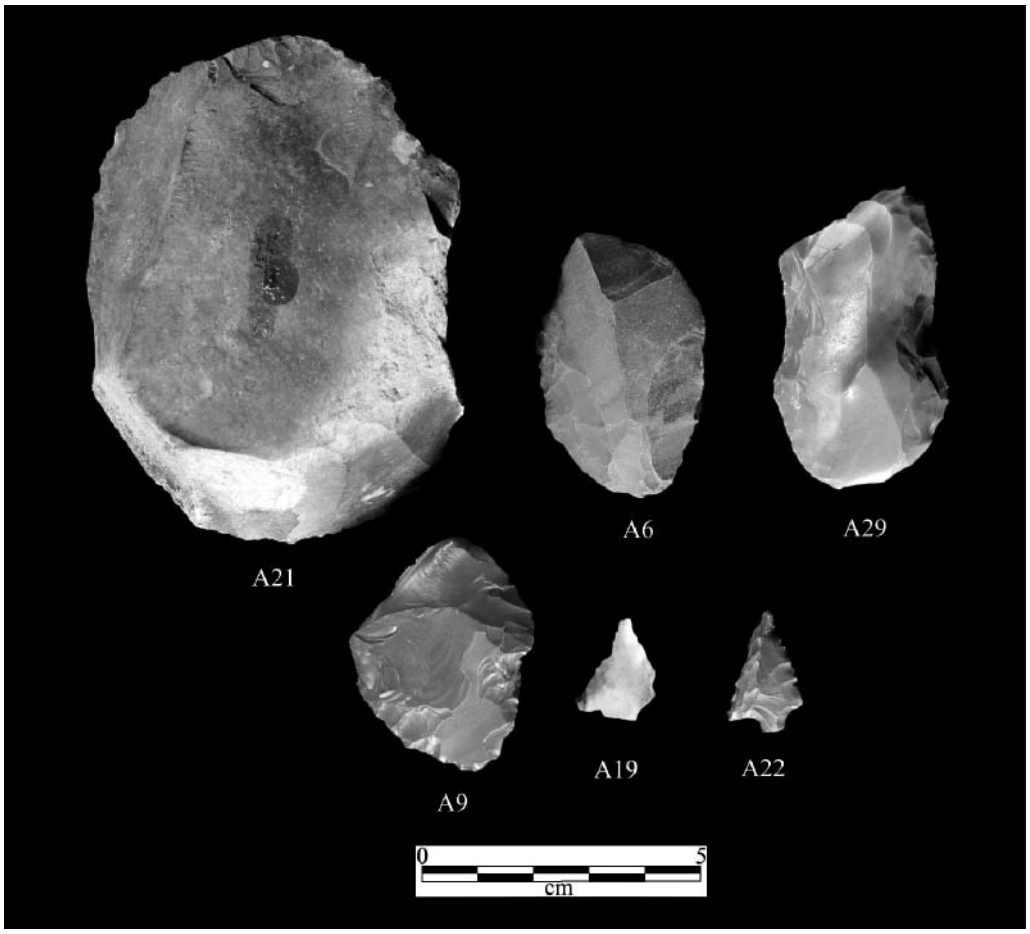


Figure 77. Surface-collected scrapers and drills from the J.B. McHam site (41BS1484). Photo: E. Blecha.

The specimen is worked bifacially in that the crushed platform and the distal tip are sloped downward on the ventral face. On the dorsal face, one lateral margin is modified in the same manner. The other margin has not been worked but exhibits heavy use-wear. The specimen is made from dark brown and red banded claystone.

Specimen A29 (Fig. 77): Specimen A29 is an ovate side and end scraper with lateral margin that contracts in the middle and expands around the distal tip to create an hour-glass shape. The specimen is made from a high-quality blue-gray chert flake or blade that is steeply modified around all edges and is dome shaped along the distal margin.

Scraper (1 specimen)

Specimen A9 (Fig. 77): Manufactured on a fragmented, thick piece of high-quality dark red jasper, this cursorily made ovate scraper has one convex margin and one

convex-irregular margin. The convex irregular margin was utilized despite its irregularity. The scraper is unifacially worked on both lateral margins and is thickest in the center of the specimen.

Biface Thinning Flake (1 specimen)

Specimen A10: This biface thinning flake is the result of a long biface margin removal. One lateral edge is heavily utilized and possibly modified. The specimen is made from mottled gray chert.

Blades (2 specimens)

Specimen A24: This specimen is a green and purple plume agate blade with two arrises on the dorsal face. The lateral margins constrict from the proximal end towards the missing distal tip.

Specimen A28: Specimen A28, a long, bluish-gray chert blade, is leaf shaped with two arrises on the dorsal face. The specimen is possibly utilized along one lateral margin.

Flake (1 specimen)

Specimen A18: This flake was collected as a toolstone sample. It is a relatively thin flake with one arris on the dorsal face and a step termination. The toolstone is chert; however, the colors are unique. The proximal portion of the flake is banded gray with yellow mottling, and the distal portion changes abruptly to light gray bands with red mottling.

Shell A30 (1 specimen)

Specimen A30: This is the fragmentary umbo of a fresh-water mussel shell that was collected from the surface of the site. The species could not be determined.

Calamity Crossing Site (41BS1485)

On June 26, 1996, the Calamity Crossing site was discovered by the SRSU field school team. This is a large open prehistoric site located on the east bank of Calamity Creek approximately 200 m (656 ft) north-northeast of the WMA headquarters. Based on artifact and feature distribution, site dimensions are ca. 90 m (295 ft) E-W by ca. 130 m (427 ft) N-S (Fig. 78).

The Calamity Crossing site is located on a silty clay loam alluvial terrace and is well elevated above the creek. The main WMA road bisects the northern portion of the site (east to west) and a fence line parallels the road to the north. At the time of recording, a new low-water crossing had been recently excavated through the northern area of the site. A secondary, gated dirt road branches north off the WMA road in the northeast portion of the site. A telephone line also crosses the site south of the WMA road. A narrow (4 m [13 ft] in width) erosional gully runs from the WMA road southeast into a larger tributary that constitutes the eastern boundary of the site, while the eastern bluff face of Calamity Creek forms its west and southwest boundary.

The site contains at least two prehistoric components—one exposed on the ground surface, the second buried roughly

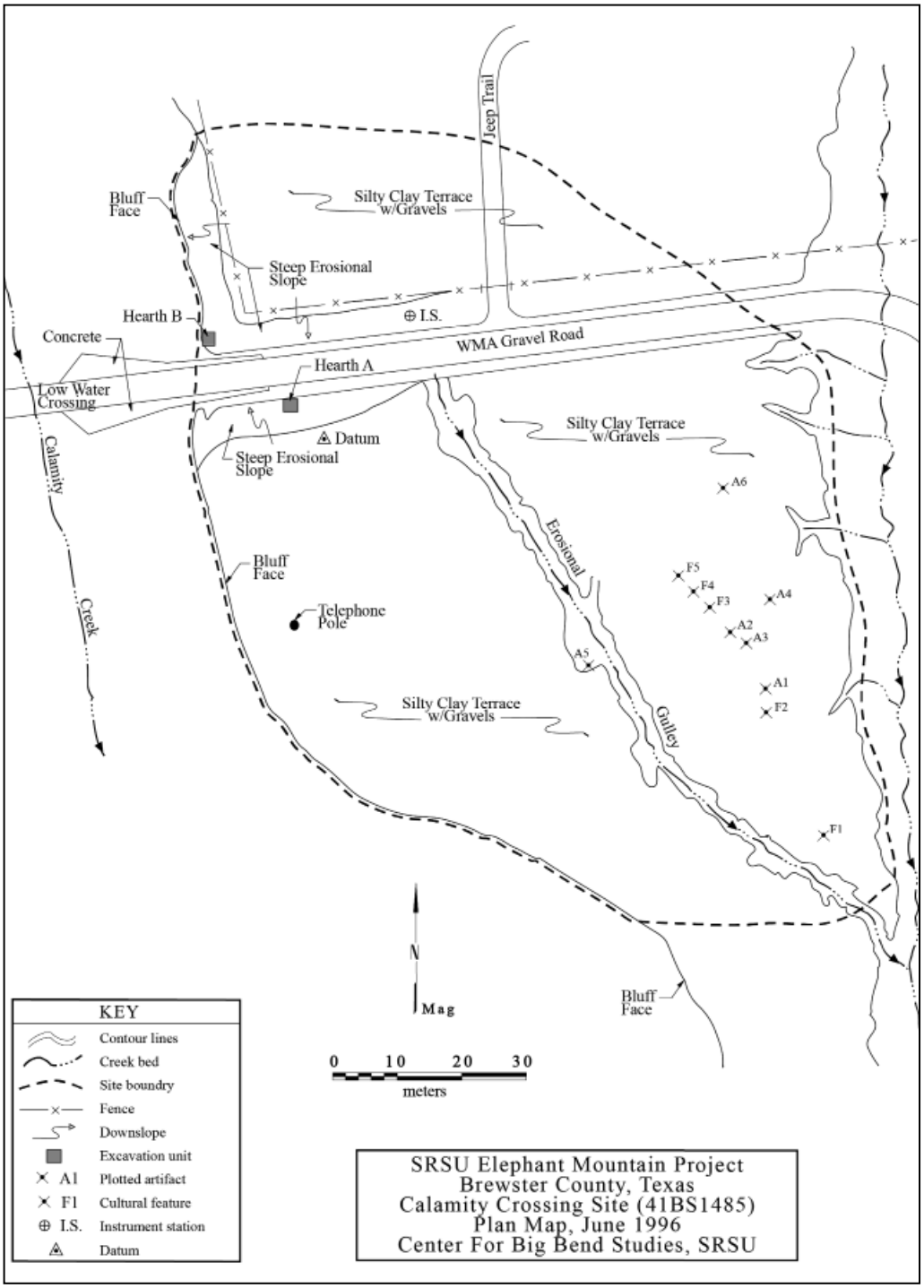


Figure 78. Plan map of Calamity Crossing site (41BS1485). Drafting: D. Hart.

2 m (7 ft) below the surface. At the time of recording, the buried cultural deposit consisted of a carbon-laden midden soil that was discernible in both embankments of the WMA roadcut and along the bluff face fronting on the mainstem creek. Two cultural features—one in each of the roadcut embankments at roughly the same elevation—were eroding into the right-of-way (Fig. 79). Abundant vegetation on-site is primarily honey mesquite (*Prosopis glandulosa*), some creosote bush (*Larrea tridentata*), pricklyash (*Zanthoxylum americanum*), algerita (*Mahonia trifoliolata*), prickly pear (*Opuntia* sp.), cane cholla (*Cylindropuntia imbricate*), and various bunch grasses.

Fieldwork

Fieldwork at the Calamity Crossing site consisted of site mapping, controlled surface collection, and what amounted to a salvage excavation of the two eroding features (Features A and B) in Calamity formation alluvium. The work was carried out on June 26–28, 1996, and concluded the field portion of the field school.

An instrument station and mapping datum were set up just south of the southern road embankment. Site boundaries, both cultural and non-cultural features, and diagnostic artifacts found across the site were mapped in detail. Controlled excavations of two partially exposed and buried features

Figure 79. Looking SSE at south bank of roadcut. Scale at center (arrow) marks buried Feature A at Calamity Crossing site (41BS1485). Photo: R. Mallouf.

(Features A and B) were conducted. Materials collected during fieldwork at 41BS1485 included toolstone samples from the surface and lithic materials associated with two hearth excavations along with matrix samples and radiocarbon samples from each feature. Feature A was excavated in an 80 x 100 cm (31 x 39 in) unit, while a 1 x 1 m (3 x 3 ft) unit was employed at the Feature B excavation.

Features

Cultural features documented at Calamity Crossing included five clustered surface hearths in the southeast portion of the site and two rock features—a hearth and a feature of unknown function—deeply buried in Calamity formation alluvium in the north end of the site.

Feature A was an oval-shaped construction that was exposed 1.88 m (6 ft) below surface in the south embankment of the low-water crossing (Figs. 80, 81, and 82). It is unknown if the machinery cut originally exposed the feature, or if it had been exposed by subsequent erosion of the road-cut embankment. Also unclear was how much of the feature had eroded away prior to the SRSU field school crew's arrival. When first discovered, a number of feature stones had fallen out and were lying below it at the base of the roadcut. Some of these pieces had ground facets, as did a number of the stones remaining *in-situ*, and a few of the feature stones were thermally fractured. It was finally estimated that less than half of the oval feature had been cut or eroded away, leaving what was essentially a longitudinal cross section in the roadcut.

Overburden above Feature A was removed by pick and shovel to within 5 cm (2 in) of its top. Careful excavation with trowels and brushes followed, and the entire feature, measuring ca. 40 x 75 cm (16 x 30 in), was exposed in plan. As excavation progressed it was noted that a number of small, flat, slab-like stones were intentionally placed on edge (vertically) inside the larger feature. The west half of the feature essentially constituted a subfeature of vertical slabs forming what appeared to be a cist-like construction (Fig. 82). The cist or "box" formed by the stones measured only 16 x 30 cm (6 x 12 in) and was of roughly rectangular shape, with its long axis oriented at 118 degrees east of north. Nothing of note was found inside this subfeature; however,

Figure 80. Feature A exposed in roadcut (below scale) at the Calamity Crossing site (41BS1485). Scale = 50 cm (20 in). Photo: R. Mallouf.

Figure 81. Looking south at Feature A during excavation, Calamity Crossing site (41BS1485). Scale = 20 cm (8 in). Photo: R. Mallouf.

Figure 82. Plan view of Feature A showing cist-like construction, Calamity Crossing site (41BS1485). Scale = 20 cm (8 in). Photo: R. Mallouf.

the matrix inside the small "box" was taken as a special sample (Matrix Sample FA-2) for laboratory analysis.

When Feature A was exposed horizontally and examined vertically in profile, there was a basin-shaped pit outline discerned that extended several centimeters below the bottom of the lowest stone. The excavation was completed at 2.16 m (7.08 ft) below ground surface without any temporally or functionally diagnostic artifacts having been found in association. Attempts to obtain material from inside Feature A for radiocarbon dating also proved unsuccessful. A scatter sample of charcoal (Radiocarbon Sample 23) taken from outside the feature at 2.11–2.16 m (6.9–7.08 ft) below ground surface was considered unreliable and not submitted for assay.

Feature B, a rock-lined hearth, was located at the intersection of the Calamity Creek cutbank and the northwest end of the low-water crossing embankment—on the opposite side of the road from Feature A and at roughly the same elevation (Fig. 83). As discovered in the creek cutbank, the hearth consisted of a few clustered fire-cracked and discolored stones in a thin ashy midden lens. As viewed on-site and verified with instrumentation, there was little doubt that both features were contained by the same deeply buried occupational lens that had been in large part destroyed by road construction.

It was evident that what remained of Feature B was eminently endangered by erosion—by both the creek cutbank and the unstabilized road embankment. In order to

Figure 83. Looking east at Feature B in road cutbank, Calamity Crossing site (41BS1485). Scale = 50 cm (20 in). Photo: R. Mallouf.

save whatever data was left, the sloping alluvial overburden was removed with a shovel and pick, and a 1 x 1 m (3 x 3 ft) excavation unit was placed to encapsulate the feature. Careful horizontal exposure of Feature B with brushes and trowels revealed it to be a somewhat scattered hearth (Fig. 84), probably of oval configuration originally, and measuring ca. 50 x 90 cm (20 x 35 in). Evidence for an associated pit was not forthcoming. The interior matrix consisted of ash, charcoal flecking, and highly fragmented burned rock.

A contracting-stem Arenosa dart point (Specimen B1; Fig. 86) and a biface fragment were encountered *in-situ* in the northeast interior of Feature B. A radiocarbon sample taken of charcoal in the immediate vicinity of the dart point yielded an assay of cal. 2459–2148 B.C. (cal. 4480–4089 yrs. B.P.). A minor amount of *in-situ* debitage was found scattered in and around the feature matrix, in the wall of the excavation unit, and during screening of the feature fill. Comparable feature elevations, an *in-situ* contracting-stem Arenosa dart point, and a related radiocarbon date all point to a Middle Archaic affiliation for excavated features A and B at Calamity Crossing. Cultural deposits on the surface of the site are indicative of succeeding Late Archaic and Late Prehistoric occupations.

Artifacts

A rather sparse scatter of fragmented fire-cracked rock and debitage were observed across the terrace surface at the Calamity Crossing site. Intensive surface inspection of the site resulted in only three formal artifacts being recovered, along with three flakes (Fig. 85; Table 27). The diagnostic artifacts include an untyped arrow point, an untyped dart preform, and a thick biface. Artifacts were also recovered during the excavation of Features A and B, including a contracting stem dart point fragment which was unearthed in direct association with Feature B.

Based on observed and cultural features, recovered cultural material, and radiocarbon dating, the upper cultural deposit at Calamity Crossing consists of a series of occupations dating from the Late Archaic (ca. 1000 B.C.–A.D. 700) through Late Prehistoric (ca. A..D. 700–1535) periods. The lower cultural deposit containing both excavated features A and B has much earlier Middle Archaic (ca. 2500–1000 B.C.) affiliations (Tables 28 and 29; Fig. 86). While much of this site has been destroyed by road construction, the remaining deposits are likely

Figure 84. Plan view of Feature B at the Calamity Crossing site (41BS1485). Scale = 20 cm (8 in). Photo: R. Mallouf.

to be of significance and worthy of research and preservation. Both surface-recovered and excavated artifacts are described in some detail below.

Surface-Collected Artifacts

Untyped Arrow Point (1 specimen)

Specimen A6 (Fig. 85): This specimen is the medial portion of a thin bifacially worked arrow point blade. Both lateral blade edges are straight. The toolstone is yellow chalcedony.

Dart Preform (1 specimen)

Specimen A4 (Fig. 85): Specimen A4 is a thin and narrow triangular dart point preform with two slightly convex lateral edges. The basal edge is also slightly convex and as wide as the blade edges. A "knot" that could not be thinned or removed is present in the middle of the specimen on the dorsal face. The specimen is made from a large flake of brown chert.

Thick Biface (1 specimen)

Specimen A5 (Fig. 85): This thick, rather crude, ovate biface is manufactured from a dark brown jasper flake. The basal edge is slightly concave with rounded basal corners. The distal tip is round as well, with slightly convex-to-straight lateral blade edges. Remnant parent flake scars are present on the ventral face. Use-wear is present along one distal blade edge.

Flakes (3 specimens)

Specimen A1: This is a large triangular white-to-translucent chalcedony flake.

Specimen A2: This red rhyolite flake is large and is missing the distal end.

Specimen A3: This flake was collected as a toolstone sample. It is a squarish flake

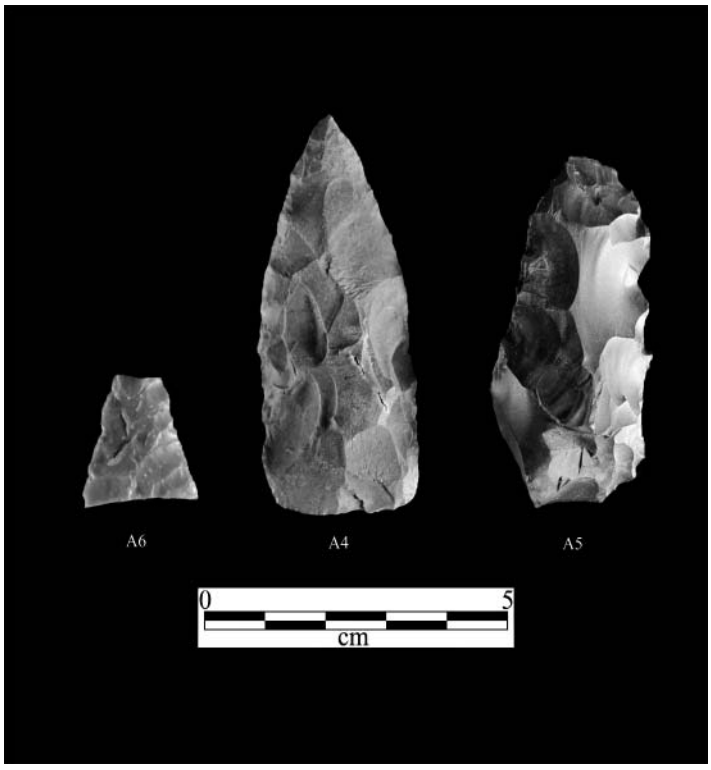


Figure 85. Surface-collected bifaces from Calamity Crossing site (41BS1485). Photo: E. Blecha.

Table 27: Surface-collected artifacts from the Calamity Crossing site (41BS1485)

Spec No.	Type	Description	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)
1	Flake	Compete	Chalcedony	45.8	42.6	13.4
2	Flake	Fragmented	Rhyolite	49	56.1	19.2
3	Flake	Material Sample	Chalcedony	45	45.1	9.3
4	Dart Preform	Complete	Chert	60.9	26.1	9.6
5	Thick Biface	Utilized	Jasper	54.1	27	16.2
6	Untyped Arrow Point	Medial Fragment	Chalcedony	n/a	19.2	3.8

Table 28: Recovered artifact from Feature A at the Calamity Crossing site (41BS1485)

Spec No.	Type	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)
FA-1	Flake	Chert	n/a	39.7	10.3

n/a – not addressed in field notes

(45 x 45.1 mm [1.7 x 1.7 in]) with a feather termination. The toolstone is dark and medium gray banded chalcedony.

Additional details concerning all surface-recovered artifacts from Calamity Crossing are provided in Table 27.

Feature A—Recovered Artifacts

Flake (1 specimen)

Specimen FA-1: This is the proximal end of a large yellowish-gray and red banded chert flake.

Feature B—Recovered Artifacts

Utilized Flakes (2 specimens)

Specimen B-2: This is a triangular piece of greenish-brown chert debitage that exhibits use-wear along the distal and one lateral margin.

Specimen B-5: This is a fragment of the lateral or distal end of a white utilized chalcedony flake.

Angular Shatter (2 specimens)

Specimen B-3: This is a small piece of gray chert shatter. It has six facets, one of which is covered in cortex.

Specimen B-4: This is a large piece of angular shatter of the same material as specimen B-3. About 60 percent of this specimen is covered in white cortex and is likely a core fragment.

Dart Point (1 specimen)

Specimen B-1 (Fig. 86): Specimen B-1 is a contracting stem Jora dart point with an off-set blade. One blade edge is strongly convex, and the other is straight. The convex blade edge converges with the neck in a weak and rounded shoulder. The other

shoulder is much stronger and pointed. The basal edge is straight and thick with an inclusion that may have proved difficult to thin. The base of the stem is missing. The specimen is made from dark bluish-gray chalcedonic chert with red bands.

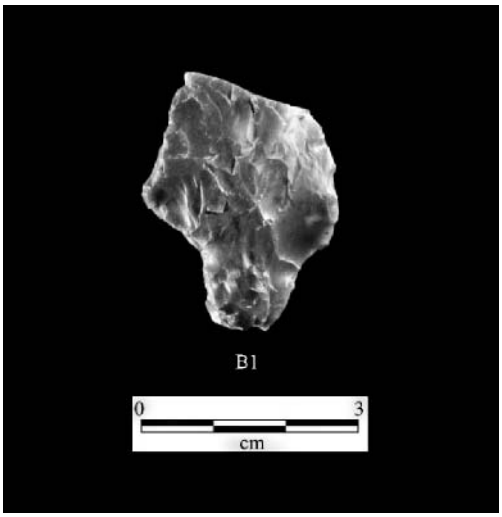


Figure 86. Jora dart point (B1) found in-situ *in Feature B, Calamity Crossing site (41BS1485). Photo: E. Blecha.*

Unplotted Debitage (25 specimens)

Twenty-five pieces of debitage were collected from hearth B in a one-quarter-inch mesh screen. The largest piece is 29 mm (1 in) long and the smallest is 2.5 mm (.09 in). There are a few pieces of debitage that appear to be from the same toolstones, indicating tool manufacture and/or maintenance at the site.

Additional data concerning recovered material from Feature B is provided in Table 29 below.

Table 29: Recovered artifacts from Feature B at the Calamity Crossing site (41BS1485)

Spec No.	Type	Material	Max Length (mm)	Max Width (mm)	Max Thick. (mm)	Neck Width (mm)
B-1	Untyped Dart Point	Chert	n/a	27	7.5	14
B-2	Utilized Flake	Chert	40.7	20.7	10.2	n/a
B-3	Angular shatter	Chert	16.9	14.5	10.5	n/a
B-4	Angular shatter	Chert	43.9	23.7	24.6	n/a
B-5	Utilized Flake	Chalcedony	n/a	35.5	14	n/a
Unplotted	Debitage	Chert	n/a	n/a	n/a	n/a

n/a = not addressed in field notes

Other Sites Recorded Within the Elephant Mountain Wildlife Management Area

Seven other significant sites, all recorded between 1989 and 1997, are found on the WMA. All of these sites were in areas of restricted access in 1996 due to the TPWD's desert bighorn restocking program, and they could not be revisited or reevaluated by the archaeological field school team. Because of their potential significance to regional research efforts, however, what is known currently about each site is summarized briefly below.

Site 41BS813

Site 41BS813 is an intensively occupied prehistoric open site to the east of Calamity Creek. Originally recorded by TPWD staff archaeologist Mike Davis in 1989, the site was not revisited by the 1996 SRSU archaeological field school. The site is located on sandy alluvial deposits ca. 150–200 m (492–656 ft) east of the main Elephant Mountain WMA road which leads to the south end of Elephant Mountain. Though unknown, the site is likely multicomponent based on the density of materials on the surface. The site contains cultural materials to a subsurface depth of at least 50 cm (20 in).

A cluster of three incipient ring middens and numerous hearths are present throughout the site. The number of individual hearths present on the site was not specified in the 1989 site form, but Davis notes that the average hearth is ca 80 cm (31 in) in diameter and composed of 15–20 limestone and unidentified volcanic rock cobbles. Davis observes that volcanic rock does not display signs of thermal alteration as readily as limestone cobbles. Cultural materials include cores, lithic debitage, manos, metates, and hammerstones. According to the documentation, there are approximately 200 flakes per square meter. The debitage consists of a variety of cherts, chalcedonies, and volcanic stone.

Chalk Valley House Site (41BS815)

The Chalk Valley House site is a ranch house built in the early 1880s and has been occupied for most of its history. The house sits near the northern base of Elephant Mountain overlooking Chalk Valley to the north. The Chalk Valley House site was not revisited during the 1996 SRSU archaeological field school, as it had been previously recorded and architecturally evaluated by both Mike Davis and TPWD architectural historian Sheron Smith-Savage in 1989.

Jack Kilpatrick, the WMA manager at the time, was interviewed by Davis for historical information about the farmhouse. Kilpatrick stated that the house was built around 1880 and was the original homestead of the Neville Family. The house was expanded in the 1880s when the land was sold to C.G. Johnson (Smith-Savage 1989; Ing 1997). An architectural evaluation of the house provided more information. Smith-Savage described the Chalk Valley House as built in the Folk Victorian style and, although it has some southwest influences—such as the use of adobe—it was primarily built in the Tidewater South tradition.

Smith-Savage also stated that architectural features such as the I-plan, high ceilings, interior fireplaces at the gable ends, narrow 4/4-light wood windows, and transom lights at exterior doors suggest construction modifications between the 1880s and 1980s. The significant historic architectural features of the house are the early L-shaped portion of the house with its room configurations and 10' 5" ceilings, as well as the window and door openings in the ell that include tall 4/4/ light wood windows and door openings with transoms. It is highly probable there was a separate kitchen and other detached dependencies which no longer exist. Smith-Savage completed her report with the observation that areas surrounding the house had a high potential for significant historic archaeological deposits (Smith-Savage 1989).

Summit Site (41BS816)

Located on the summit of Elephant Mountain are multiple postulated hunting-blind enclosures built into a bedrock outcrop and situated adjacent to a large *tinaja*. The Summit site consists of three low stacked-stone enclosures and a sparse lithic scatter, including one thick biface. The enclosures are comprised of four to five stone courses, with small rocks used as chinking between some of the layers. No artifacts were observed inside the features. This site was recorded by Mike Davis and Virginia Wulfkuhle in 1989. The 1996 Sul Ross State University field school did not have the opportunity to revisit the site since the mountain summit was in restricted big horn sheep habitat.

Molcajete Spring Site (41BS817)

The Molcajete Spring site was recorded in 1989 by Mike Davis and archaeologist Virginia Wulfkuhle (SRSU, Museum of the Big Bend) for the TPWD. Located on the

toeslope of the south side of Elephant Mountain, this site has an excellent view of Green Valley and the Calamity Creek floodplain to the southwest and south. An active spring is located ca. 350 m (1,148 ft) upslope—to the north—and runs through the eastern portion of the site. It is a prehistoric open site with a likelihood of multiple occupations. A dirt road to Elephant Mountain WMA headquarters bisects the site from east to west. Two circular water toughs are also located within the site to the north. The boundaries of the site were delineated by the extent of the features and sparse lithic scatter.

No diagnostic artifacts were observed during the 1989 reconnaissance effort; however, multiple features were recorded. The features include a large ring midden 4.5 m (15 ft) in diameter, six bedrock mortars on top of a car-sized boulder, two large basin bedrock mortars (molcajetes)—each in a medium-sized boulder—and a scatter of fire-cracked rock. The 1996 SRSU field school did not have the opportunity to revisit the site due to its location in a restricted area.

Solo Cairn Site (41BS1067)

The Solo Cairn site is comprised of a single-stacked rock feature of unknown age or cultural affiliation. The feature is located on the east bank of Calamity Creek, at the head of a gully that runs west-northwest to east-southeast. The southeasternmost limit of the Calamity Meander site (41BS1103) lies only 20 m (66 ft) to the east of the cairn. Vegetation located around the site includes honey mesquite (*Prosopis glandulosa*), four-winged saltbush (*Atriplex canescens*), creosote bush (*Larrea tridentata*), Russian thistle (*Salsola tragus*), and various desert grasses.

The cairn has been slightly disturbed. There are approximately 10 stones in the intact portion and another 5 to 6 stones located downslope in the gully approximately 1 m (3 ft) from the core area. The intact portion is ca. 1.5 x 1.5 m (5 x 5 ft) and consists of tightly clustered large cobbles averaging ca. 40 x 25 x 15 cm (16 x 10 x 6 in) in size. The intact portion of the cairn rises ca. 20–30 cm (8–12 in) above the ground surface.

This site was recorded in January 1996 by Center for Big Bend Studies archaeologist William A. Cloud as a part of the Calamity Creek Channel Realignment Project. Cloud notes that he did not observe any cultural material in the vicinity of the cairn. However, a threaded two-inch-wide pipe 1.2–1.5 m (4–5 ft) long was observed ca. 5 m (16 ft) southeast of the cairn. The site was revisited during a 2002 fiber-optic line project on the WMA, but little more could be ascertained at that time (Cloud 2002).

Calamity Meander Site (41BS1103)

The Calamity Meander site is an extensive prehistoric open site located on a relatively flat terrace fronting on the east bank of Calamity Creek (Fig. 87). The creek cutbank is approximately 6 m (20 ft) high, while a cutbank along a small adjoining intermittent tributary here varies in height from 2 to 4 m (7 to 13 ft). The site wraps around a large

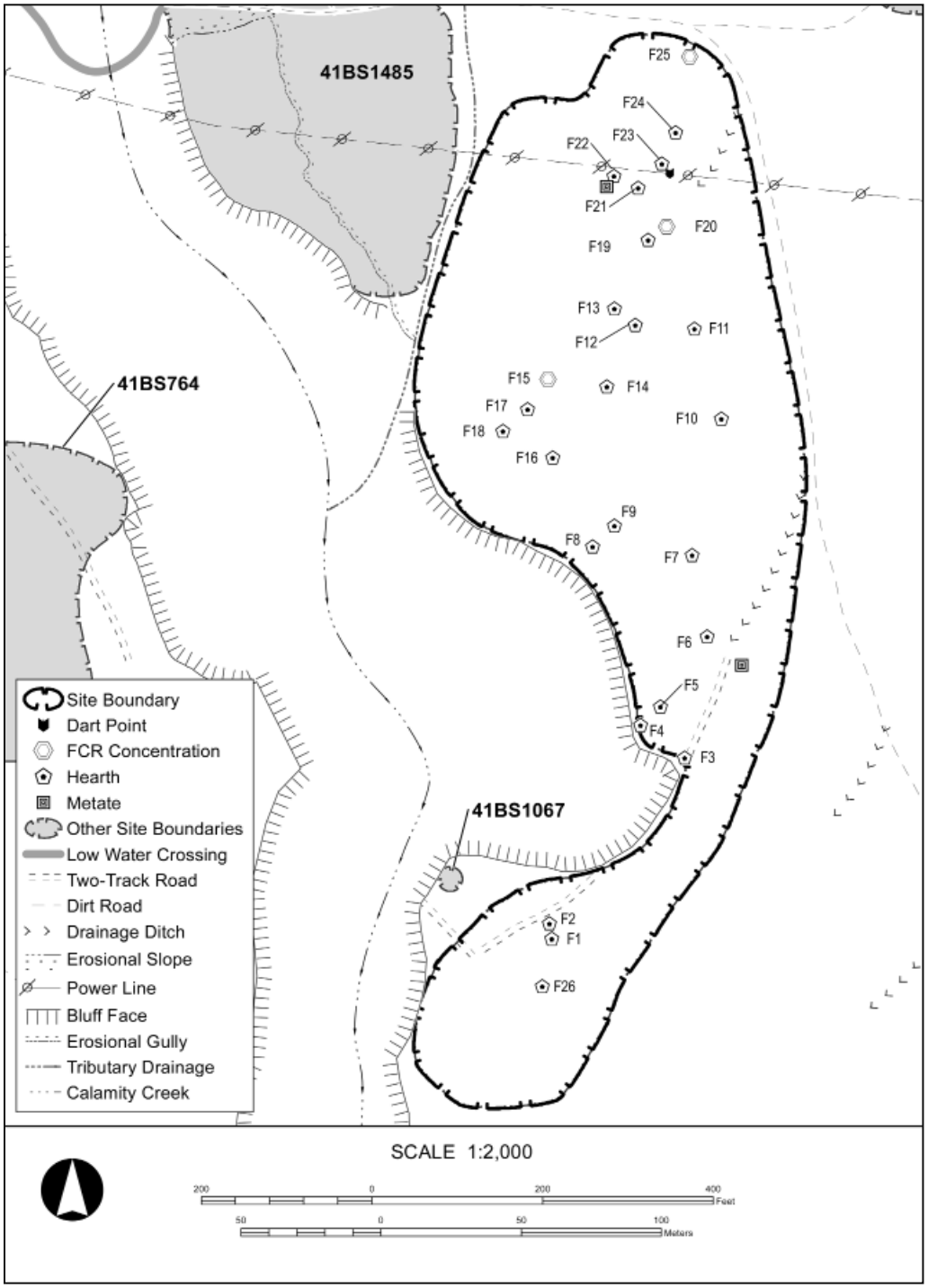


Figure 87. Plan map of the Calamity Meander site (41BS1103). Drafting E. Blecha.

meander bend of the mainstem creek, hence the site name Calamity Meander. A dirt road marks the north and east site boundaries, and a power line runs roughly east to west across the northern portion of the site. Vegetation recorded throughout the site includes creoste bush (*Larrea tridentata*), mariola, honey mesquite (*Prosopis glandulosa*), tasajillo (*Cylindropuntia leptocaulis*), cane cholla (*Cylindropuntia imbricate*), allthorn (*Castela erecta texana*), four-winged saltbush (*Atriplex canescens*), Spanish dagger (*Yucca sp.*), and various desert grasses.

The site was recorded by the CBBS in January 1996 as part of the Calamity Creek Channel Realignment Project. The site contained at least 25 surface thermal features scattered in no discernable pattern. The features were in varying degrees of intactness and included 22 hearths and 3 fire-cracked rock concentrations. Only 1 hearth feature appeared to be completely intact (F11), and 13 hearth features were estimated to be partially intact. The remaining hearth features were scattered and blown out—likely due to aeolian erosion (Cloud n.d.).

Diagnostic and formal artifacts recovered from the site surface included a dart point base (A1), biface fragments, unidirectional blade cores, bidirectional cores, a hammerstone, blades, a basin-shaped metate fragment, a slab metate, several two-sided manos, and core fragments. Stone material types recorded on the surface included brown agate, red agate, rhyolite (brown and mottled purple), chalcedony (opaque and reddish-brown), jasper, and chert (gray, tan, green, white, and grayish-brown). Other artifacts observed included a modern sardine can, shotgun shell casings (.410 and 12-gauge), and rusted pull-top tin cans. Cultural materials observed on the site were indicative of Late Archaic (1000 B.C.–A.D. 700) and Late Prehistoric (A.D. 700– 1535) period occupations. A lack of diagnostic surface artifacts, along with proximity to a road, suggests that the site has been frequently surface-collected in the past.

Additional information on the Calamity Meander site can be found in Houk and Barile (2000) and Cloud (2002).

Fence Line Site (41BS1228)

The Fence Line site was discovered by TPWD archaeologist J. David Ing in February 1997 and was recorded in detail by him in April of the same year (Ing 1997). It was found during survey of a proposed 5 km (3.3 mi) fence line route within the WMA. This large 150 x 150 m (492 x 492 ft) open prehistoric campsite is located at the toe of an alluvial fan and extends onto a terrace of Chalk Draw on the southeast side of Elephant Mountain. The Del Norte Mountains and Del Norte Pass are visible a short distance to the east. It is in an area that was off limits to the 1996 field school.

The Fence Line site consists of a series of hearths, metates, midden soils, and scattered lithic debitage and tools exposed on the surface. In his detailed recording of the site, Ing mapped the surface features and did a controlled surface-collection of temporally and functionally diagnostic artifacts. The artifacts were largely concentrated in

the east-central portion of the site. Ing collected seven dart points, one arrow point, and a possible scratched stone from the surface, and estimated the site to date from the Early Archaic (6500–2500 B.C.) through Late Prehistoric (A.D. 700–1535) periods based upon survey findings (Ing 1997).

Following Ing's recommendations, the Fence Line site was further investigated in May 1997 by archaeologists and other staff of the TPWD. In addition to a second controlled surface-collection of the site, three shovel tests were performed—two along the proposed fence line route, and one along the terrace of Chalk Draw in the northeastern part of the site. The tests were excavated to depths of 70, 90, and 100 cm (28, 35, and 39 in) below ground surface and yielded only a few pieces of debitage and burned rock. The investigators concluded that the Fence Line site contained "a minor buried component of a much lower density than the artifact scatter observed on the surface" and recommended that the use of machinery be avoided during fence construction (Howard 1997).

Summary and Discussion

Located 42 km (26 mi) south of Alpine, Texas, at the southernmost expression of the Davis Mountains, Elephant Mountain is a prominent fixture in the minds of both residents and visitors to the Big Bend region. This magnificent landform is visible from widespread—and in some cases distant—locations and, along with close-by Santiago Peak, has served historically as a guiding landmark for travelers across the region. Rising some 610 m (2,001 ft) above the valley floor, the mountain overlooks and parallels the courses of two significant Big Bend drainage systems—Chalk Draw to its east and Calamity Creek to its west. Across Chalk Draw, and only 8.5 km (5.3 mi) to the east of Elephant Mountain, lies Paso del Norte, the southern termination of the Del Norte Mountains. A historically significant pass, Paso del Norte connects the upper Maravillas Creek drainage system with Green Valley, a vast, low desert scrub alluvial plain that constitutes the upper Terlingua Creek drainage basin.

On the west side of Elephant Mountain is Calamity Creek, a deeply incised arroyo system that is bound on its west by vertical-walled Crossen and Kokernot mesas. The creek valley floor here is narrow, relatively featureless, and hemmed in by igneous landforms. Historically a live-water drainage, Calamity Creek has headwaters north of Cathedral Mountain in the southern foothills of Paisano Peak. From its headwaters, its riparian course is southward through erosionally dissected, oak/juniper-clad hills and canyons to its rendezvous with Elephant Mountain, where it swiftly transitions to an arid streambed in a creosote-dominated, low-desert environment. Here it has become a typically dry, but intermittent, arroyo deeply entrenched in thick Quaternary and Recent alluvium. As it exits from its Elephant Mountain setting, the creek enters a much-changed world—a low-desert environment dominated by desert scrub grassland.

When viewed from this generalized perspective, it can be inferred that the ecological setting of the study area has—through time—played a critical role in the lifeways of Elephant Mountain inhabitants. The setting is that of a definable ecotone embedded at the rather abrupt intersection of two major physiographic domains—low desert and

canyon woodlands. It is likely that the segment of Calamity Creek subjected to study by the 1996 field school investigation was, both in the remote and more recent past, a perennial meandering stream punctuated here and there with small, well-vegetated cienegas. Supporting evidence for this scenario includes the fact that upstream reaches of the creek still have live water even in today's arid environment, and in the fact that carbonized aquatic rushes and/or reeds—likely burned by fast-moving prairie fires—are preserved deeply buried in cutbank alluvium at Site 41BS814. Perhaps compounding this evidence are the deep cutbanks themselves that increase in depth as one travels downstream and the corresponding density of human occupation through time, which suggests the presence of a dependable water source.

In addition to water, the favorability of this ecotonal setting for human occupation during prehistory would seem evident. Plant and animal resources found in the low desert, and those of the high canyon woodlands, were integrated and available in this transitional ecotone, and these were in turn enhanced by riparian resources that would have existed along the stream course itself. Gravel bars in Calamity Creek were the source of some of the highest-quality siliceous stone for the making of stone tools to be found in the Big Bend, and primary sources for those toolstones were present in upstream areas of the creek basin and in the close-by Del Norte and Caballo Mountains, easily accessible by Paso del Norte to the east. The smooth-to-gently undulating surface of the basin alluvium was also a positive factor with respect to settlement. Rock-free areas for campsites and easily dug soil for the construction of pits, hearths, and other features were typical rather than exceptional. This well-watered route thus had a plethora of needed resources, from wild plant foods and abundant game, to exceptional quality toolstone and favorable, protected campsites. In sum, the Calamity Creek drainage system offered optimum resources and a logistically favorable north-south corridor for passage through the igneous and sedimentary ridges and canyons on the north, and into the open low desert of the south.

Attesting to the favorability of this Calamity Creek segment for human habitation is the sheer density of archaeological sites to be found here. The 1996 field school participants conducted archaeological survey of roughly 60 percent of a 1.0 x 3.5 km (.6 x 2.2 mi) swath of the creek environs, discovering and/or revisiting 12 archaeological sites (Table 30), several of which were quite extensive. Because of bighorn sheep access restrictions, a restricted 2 km (1 mi) stretch of terrace on the east side of the creek within this same project zone was, of necessity, left unsurveyed. Were a survey of this east terrace to be performed, it would almost certainly yield additional sites.

Another factor influencing site density in this segment of the creek entails the likelihood of still-undiscovered buried sites. Some 40 percent of 16 sites eventually documented here between 1937 and 2005 have been determined to have buried, as well as surface, cultural components. In at least three of these cases, the sites were

Table 30: Data for open sites discovered or revisited by 1996 Field School at Calamity Creek

Trinomial	Site Name	Site Type	Landform	Elevation (ft AMSL)	Site Size (m)	Cultural Features*	Cultural Material**	Estimated Chronology	Site Condition
41BS37	Alpine 9:13	Open site	Creek terrace	4240	90 x 80	a, b	*A, C, D, E, I, K, L, N, O, P, Q*	*Early Archaic, Late Archaic, Late Prehistoric*	*Good*
41BS764	Curious Lizard	Open site	Low rise	4280	120 x 70	a	*A, B, E, I, J, K, L O, P, Q, R, S*	*Early Archaic, Late Prehistoric*	*Fair*
41BS810		Open site	Creek terrace	4310	580 x 100	a, c, f	*A, B, D, E, I, O, P, Q*	*Late Archaic, Late Prehistoric, Late Paleoindian*	*Fair*
41BS811		Open site	Flood plain	4300	240 x 130	a, c, d	*A, B, E, P*	*Late Archaic, Late Prehistoric*	*Good*
41BS814		Open site	Creek terrace	4300	N/A	a	*P, Q*	*Early Archaic, Historic*	*Good*
41BS1104	Hackberry Motte	Open site	Creek terrace	4320	520 x 220	none	*C, L, O, P, T*	*Middle Archaic?*	*Poor*
41BS1480	Stinger	Open site	Creek terrace	4285	400 x 150	a, b, c, k, l	*A, B, E, I, L, O, P, R*	*Late Archaic, Late Prehistoric*	*Poor*
41BS1481	Rounders	Open site	Creek terrace	4280	120 x 118	a	*A, B, C, D, F, K, P*	*Late Archaic, Late Prehistoric*	*Good*
41BS1482	Diamondback	Open site	Creek terrace	4260	180 x 125	a, e	*A, B, C, E, G, H, I, L, M, O, P, Q*	*Late Archaic, Late Prehistoric*	*Good*
41BS1483	Green Cholla	Open site	Low rise	4270	110 X 60	a	*A, B, C, E, F, I, N, O, P, R*	*Late Archaic, Late Prehistoric*	*Good*
41BS1484	J.B. McHam	Open site	Alluvial terrace	4185	350 x 250	a, d, f, g, h, j	*A, B, C, D, E, F, I, K, N, P, S*	*Late Archaic, Late Prehistoric*	*Good*
41BS1485	Calamity Crossing	Open site	Creek terrace	4260	130 x 90	a, i	*A, B, E, O, P*	*Middle Archaic to Late Prehistoric*	*Poor*

***Legend for Cultural Features**

a	Hearth	g	Cache
b	Incipient ring midden	h	Historic unknown
c	Burned rock concentration	i	Cist-like?
d	Knapping station	j	Metate
e	FCR & lithic scatter concentration	k	Rock pile
f	Cobble concentration–burial?	l	Cement fragment pile

***** Legend for Cultural Material***

A	Dart point	H	Graver	O	Utilized Flake
B	Arrow point	I	Scraper	P	Debitage
C	Preform	J	Spokeshave	Q	Hammerstone
D	Knife	K	Biface thinning flake	R	Mano
E	Biface	L	Core	S	Mussel shell
F	Drill	M	Denticulate flake		
G	Perforator	N	Blade		

defined on the basis of buried components that were discernible only in the creek cutbanks. Based upon the high incidence of currently known buried components, it is likely that additional buried sites are present along the creek. When all factors are considered then, a reasonable estimate of the actual number of sites present within just this segment of the Calamity basin would be in the neighborhood of 30 to 40. Simply stated, a very high site density for such a short (3.5 km [2.2 mi]) segment of the creek.

The surface areas of the 12 archaeological sites investigated by the field school along the creek are highly variable, ranging from quite small to quite extensive. The largest site among the 12 is Hackberry Motte (41BS1104) which, as late as 2005, was the largest site 520 x 220 m (1,706 x 722 ft) yet documented in the Elephant Mountain WMA. Although horizontally extensive, this site appeared to have had a relatively shallow cultural deposit with thermal features that were essentially dispersed and destroyed by agricultural practices (plowing) during the first half of the twentieth century. In contrast, the second largest site, 41BS810 (580 x 100 m [1,903 x 328 ft]), located a short distance to the south of Hackberry Motte, contained multiple intact thermal features that were concentrated in the central area of the site. Unlike Hackberry Motte, which yielded only a single temporally diagnostic artifact of Archaic affiliation, Site 41BS810 had a much denser surface scatter of cultural material representing Late Paleoindian through Late Prehistoric period occupations. Portions of Site 41BS810 appeared to have escaped the plow and were suspected to have substantial cultural deposits in both near-surface and deeply buried contexts. Like most of the other large sites in the study area, the surface expression of 41BS810 is believed to reflect many brief occupations through time, the remains of which have become coalesced and mixed as a result of erosional forces and, in some cases, agricultural practices.

Interestingly, when site data from the field school are compiled and compared (Table 31), some preliminary patterns begin to emerge, regardless of the fact that the overall sample of sites and their cultural content is limited.

- Regardless of site size or location, cobble-lined circular-to-oval shallow basin hearths are the most common feature type both on the surface of sites and in the creek cutbanks; they typically have diameters of less than 1 m (3 ft) and do not reflect intensive and/or repeated use (e.g., thermal fracturing of rock is minimal and charcoal, while often present, is not abundant).

- Ring middens are uncommon and, when present, are small and in an incipient stage of development. Well-developed ring middens appear not to be present in the study area.

- Cairns of stacked stone—a common feature type in the Big Bend—were not observed either in or outside of sites in the study area. This may be accounted for by the fact that survey was restricted

Table 31: Radiocarbon assays

Site No.	Site Name	Lab No.	Material Dated	13C/12C Ratio	Conventional C14 Age	Calibrated Yrs. B.P. (2-sigma)	Calibrated Yrs. B.C./A.D. (2-sigma)
41BS814	–	GX-25789	Charcoal; Hearth 1	-24.7%	4600 +/- 80	5580–4986	3631–3037 B.C
41BS814	–	GX-25790	Charcoal; Hearth 2	-25.3%	375 +/- 45	507–315	AD 1443–1635
41BS1481	Rounders	GX-25791	Charcoal; Hearth A	-20.3%	400 +/- 70	*534–307	*AD 1417–1644
41BS1482	Diamond-back	GX-25792	Charcoal; Feature 20	-25.2%	160 +/- 80	*422	*AD 1529
41BS1482	Diamond-back	GX-25793-AMS	Charcoal; Feature 20	-25.6%	680 +/- 40	688–556	AD 1263–1394
41BS1485	Calamity Crossing	GX-25794-AMS	Charcoal; Feature B	-20.1%	3830 +/- 40	4408–4097	2459–2148 B.C.

* date extends out of range

to low-elevation areas where cairns are not typically encountered.

- As might be expected, feature type variability is highest on large sites; however, there is a notable homogeneity of features that crosscuts all sites, suggesting similar site functions and intrasite activities through time.

- While observable features tend to be homogeneous, the numbers of such features are highly variable from site to site, indicating that at least a few of the 12 sites investigated were—for reasons still unclear—preferred for occupation through time; this is particularly interesting in light of the seemingly common environmental setting shared by all 12 investigated sites.

- While the densities of artifactual remains vary considerably from site to site, the kinds of material present on sites are repetitive and exhibit only minimal variation, thus corresponding to a similar trend found among cultural features (see above).

- Gravel bar deposits on the creek floor were an important source of unusually high-quality siliceous stone (agate, chalcedony, jasper, chert) for the manufacture of stone implements; other nearby toolstone sources included primary outcrops of limestone cherts, Maravillas chert, and Caballos novaculite in the nearby Paso del Norte area; the McHam site (41BS1484) biface cache specimens are all of gray limestone cherts, having probable origins in the Del Norte Mountains (Mallouf 2013).

- While present in sites, groundstone implements were not common, the only notable occurrences being at deeply

buried Feature A, an Archaic period cist-like construction in the Calamity Crossing site (41BS1485), and in Burial 2 at the Sheep Creek site (41BS36).

- With the exception of the McHam site biface cache (lithic caches are relatively rare), stone tool assemblages recovered from the surfaces of the 12 investigated sites are strongly homogeneous and reflective of generalized hunter-gatherer lifeways across the Big Bend region.

- Marked discrepancies in the densities of temporally and/or functionally diagnostic artifacts from site to site are likely attributable to past relic hunting, a common source of bias—sometimes unrecognized or not considered when quantifying data from surface collections.

- No evidence of Early Paleoindian (Clovis) occupation was forthcoming from the field school survey, although one Clovis point (Fig. 88) was reportedly discovered in the northern vicinity of Elephant Mountain many years ago, as were mammoth remains. However, neither discovery can as yet be verified as to specific location, and currently there is no known linkage between the two finds (CBBS, documentation on file; Mallouf

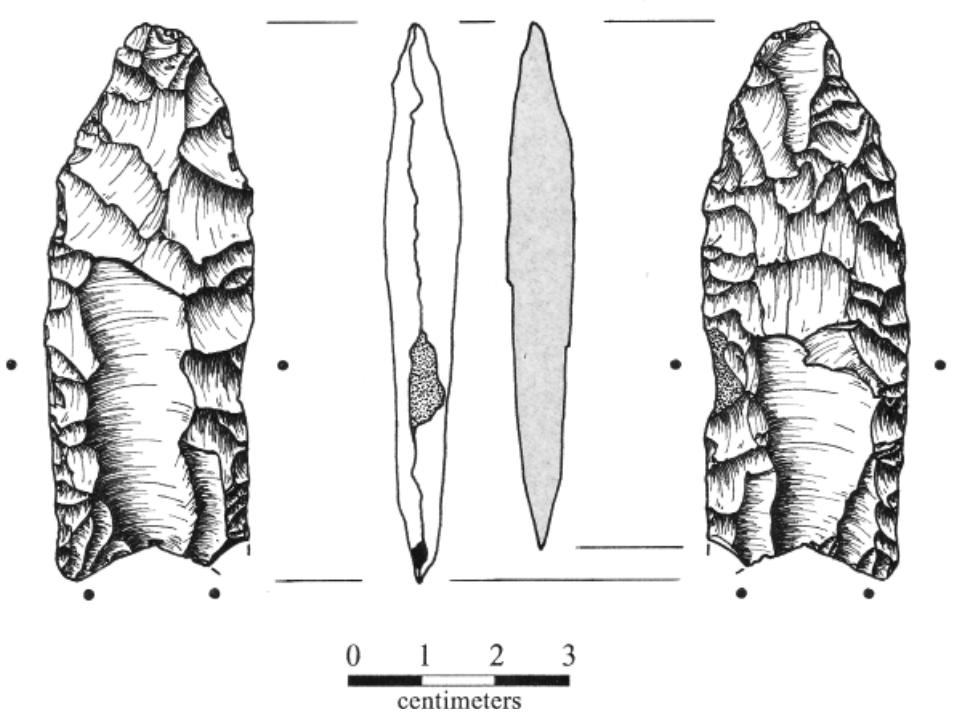


Figure 88. A Clovis point reportedly found in the northern vicinity of Elephant Mountain (CBBS, documentation on file). Drafting by D. Hart.

and Seebach 2006). These discoveries were made in areas that were off limits to the 1996 field school. Evidence for a Late Paleoindian presence is also sparse, being limited to surface finds of two projectile points (Dalton and Angostura) on a single site—41BS810, which fronts on Calamity Creek. While not common, finds of Late Paleoindian dart points are made consistently in nearby areas to the southwest in Green Valley and are known from the Caballos Mountains to the northeast of nearby Paso del Norte. Significant Late Paleoindian thermal features have been discovered and investigated at two Green Valley sites to the southwest of Elephant Mountain in recent years—the Genevieve Lykes Duncan site (41BS2615; Cloud et al. 2016) and the Searcher site (41BS2621; Mallouf 2012). Geomorphological data would suggest that the likelihood of deeply buried Late Paleoindian components being encountered at Elephant Mountain in the future is high.

- Based on recovered artifact types and radiocarbon dating of a deeply buried creek cutbank hearth, Early Archaic components (ca. 6500–2500 B.C.) are fairly well represented in the Elephant Mountain WMA (see Table 30). The most conclusive evidence comes from Site 41BS814, where a thermal feature buried deep in the Calamity formation yielded a radiocarbon assay of 3631–3037 B.C. In addition, Early Archaic dart points, primarily of the Pandale type, were recovered from two other sites (41BS37 and 41BS764) in the study area. The deeply buried lower component at the Calamity Creek site (Alpine 9:1b), which was positioned near-to or at the contact between the Neville and Calamity formations, and which Kelley termed the "Maravillas complex" (Kelley, Campbell, and Lehmer 1940:117), could eventually prove to have Early Archaic affinities. As was determined by Mandel and Mallouf in 1996, deeply buried soils of an appropriate age for the presence of Early Archaic remains are present in long segments of cutbank exposures on the WMA (Mandel 2002). Interestingly, more recent research in northern areas of Green Valley (Boren 2012), a short distance to the southwest of Elephant Mountain, has yielded irrefutable evidence of a strong Early Archaic presence in the general neighborhood.

- Evidence for Middle Archaic (ca. 2500–1000 B.C.) occupation of the study area was conclusive, but in some ways surprisingly meager. Contracting stem dart points—key markers of Middle Archaic components in the Big Bend—with one possible exception were entirely lacking on the surface of sites. Definitive evidence for a Middle Archaic presence was, however, forthcoming at the Calamity Crossing site (41BS1485), where a radiocarbon assay of 2459–2146 B.C. was obtained from a buried hearth (Feature B) having an associated contracting stem Jora dart point (Table 31). An accompanying buried but enigmatic feature (Feature A) at roughly the same

elevation, and containing a cist-like subfeature, is also surmised to be of early Middle Archaic age. Other study area features theorized on the basis of geoarchaeological and artifactual data to have Middle Archaic affinities include Burials 1 and 2 at the Sheep Creek site (41BS36), and possibly the lower campsite component at the Calamity Creek site (Alpine 9:1b).

- Artifactual evidence for Late Archaic (ca. 1000 B.C.–A.D. 700) occupation of the study area was virtually ubiquitous (see Table 30). Nine of the 12 sites investigated by the field school yielded surface artifacts diagnostic of the Late Archaic period. It can probably be assumed that many of the features being exposed by sheet erosion on these same sites in 1996 were Late Archaic in origin as well. Based on soils analysis and lithic technological attributes, there is a strong likelihood that the McHam site (41BS1484) biface cache is of Late Archaic affiliation (Mallouf 2013:146), as is the upper buried component discovered in 1938 at the Calamity Creek site (Alpine 9:1b; see Kelley, Campbell, and Lehmer 1940:110–111). Overall, data recovered during the 1996 field school would seem to support a hypothesized marked increase in human population and/or population density in the Big Bend during the Late Archaic period (Mallouf 1985:125), a demographic trend that appears to have continued into the following Late Prehistoric period as well.

- Like the Late Archaic, the Late Prehistoric (A.D. 700–1535) period is well represented by arrow points and other temporally diagnostic stone implements in 10 of the 12 investigated sites along Calamity Creek in the study area (see Table 30). It is certain that many of the hearths, as well as the few recorded incipient ring middens being exposed by sheet erosion, are also of this period. Other Late Prehistoric tool forms recovered here include flake drills, gravers, arrow point preforms, triangular end scrapers, conical blade cores, and a few prismatic blades. A radiocarbon assay of A.D. 1263–1394 was obtained from a charcoal sample adjacent to and at roughly the same elevation as a shallowly buried cutbank hearth (Feature 20) at the Diamondback site (41BS1482). The temporal range of this feature essentially straddles the cultural transition from Livermore arrow point components (Late Prehistoric I) to those of Perdiz arrow point components (Late Prehistoric II) in the Big Bend. Perdiz, in particular, is a common arrow point type in the Calamity Creek sites, and it is anticipated that exceptional, uncontaminated Perdiz-bearing components exist on the WMA.

- The transitional Late Prehistoric to Contact (historic) period is, based on radiocarbon sampling, represented in at least 3 of the 12 investigated sites. A thermal feature (Hearth 2) located just below ground surface near the top of Profile 2 at Site 41BS814 was radiocarbon dated

to A.D. 1443–1635. The only distinguishing attribute of this feature was its appropriate physical location atop the long temporal sequence at the site. A similar radiocarbon date of A.D. 1417–1644 was forthcoming from thermal Feature 4 at the Rounders site (41BS1481), and a third date of A.D. 1529 (to Recent), or just before the first Spanish incursion into the region, was obtained from the interior of Feature 20 at the Diamondback site (41BS1482). The potential exists then, for at least three transitional Contact period components on the WMA. It should be emphasized, however, that this inference is based solely on radiocarbon assays, and a likelihood that the live-water status of Calamity Creek served as a draw in early historic, as well as prehistoric, times.

Taken together, the above data trends would seem to indicate that occupations of the study area through time, while quite frequent, were relatively brief and transitory in nature. Based on admittedly limited sampling, the Calamity Creek basin might best be viewed as a live-water, resource-abundant, north-south corridor through which small bands of hunter-gatherers passed at frequent intervals. The small size, typically non-intensive use, yet high density of thermal features, along with a consistent but narrow range of chipped stone tools and low density of ground implements, would all seem to support such a conjecture. Unfortunately, the degree to which past relic hunting has skewed this database cannot be realistically addressed. Suffice it to say that all the archaeological sites along this segment of Calamity Creek might have been easily accessed by relic collectors prior to the establishment of the WMA in 1985.

As noted previously, by far the majority of cultural features documented on the surface of sites and in eroding cutbanks along the creek tend to have a rather homogeneous suite of characteristics. There are, however, four exceptions that would seem to be deserving of additional comment. These include two human burials excavated at the Sheep Creek site (41BS36), the Feature A cist at the Calamity Crossing site (41BS1485), and the biface cache discovered at the McHam site (41BS1484).

The human burials (Burials 1 and 2) discovered and excavated by J. Charles Kelley at the Sheep Creek site (41BS36) in the late summer of 1937 (see previous section entitled "Elephant Mountain Archaeology: 1920–2005") are of particular interest. With the passage of over 80 years of episodic archaeological research since their discovery, it is now possible to gauge them in a broader context of past regional mortuary practices. Burial 1 of a "middle-aged" female was in a flexed position beneath "a large cluster of hearthstones" (see Figs. 6 and 7). Apparently, mixed in with the burned rock were fragments of two metates, two "choppers," and two cores. The reporting emphasizes the fact that the hearthstones capping the burial were not a hearth, but instead had been "collected and placed above the skeleton" (Kelley, Campbell, and Lehmer 1940:97–99). Whether or not this might be classified as a "cairn burial" by

modern definition remains open for discussion. Significantly, however, this probable Middle Archaic burial remains the only documented mortuary feature with a hearthstone capping in the eastern Trans-Pecos region.

If Burial 1 is somewhat unusual for the Big Bend, Burial 2 must be considered extraordinary. Burial 2, interred only 30 cm (12 in) below and some 50 cm (20 in) to the south of Burial 1 at the Sheep Creek site, was that of a "middle-aged male," also in flexed position, and encapsulated by a series of large stone slabs and slab metates set on edge and tilted outward from the body. The slabs thus formed a rough oval around the skeletal remains. This interment was centrally capped off with a horizontally placed slab metate (see Figs. 8, 9, and 10). As far as is known to the authors, this is the only slab burial of its kind yet documented for the eastern Trans-Pecos region, and certainly for the Big Bend. Strikingly similar prehistoric mortuary features are found in north-central and west-central Texas, but they are much younger in age (Late Prehistoric) than the Sheep Creek site feature, which is likely of Middle Archaic affiliation. With no other comparable features yet found in the Big Bend, any inferences offered at present would, of necessity, be highly speculative.

One of the remaining two features deserving of comment is the small cist-like construction in Feature A at the Calamity Crossing site (41BS1485). The use of vertically placed slabs in this feature (see Fig. 82) would seem to reinforce its interpretation as being intentionally constructed—possibly for storage of foodstuffs or other objects. The inclusion in this feature of various items of groundstone suggests plant processing as a related activity. The only other physically comparable Big Bend cist known to the authors was found inside the entranceway of a Cielo complex wickiup at the Arroyo de las Burras site (41PS191) during an earlier SRSU archaeological field school (Mallouf 1995:24). However, this latter feature was much younger (Late Prehistoric) in age than the Calamity Crossing (Middle Archaic) example.

And finally, the biface cache discovered at the McHam site (41BS1484) during the 1996 field school, while not strikingly unique, numbers among only a handful of such features documented for the Big Bend region (see Fig. 70). The 17 cache specimens, all gray limestone chert, were cached inside a site near the southern end of Elephant Mountain and the Calamity Creek corridor and, for whatever reason, were never recovered by their maker. Inferred to be late stage preforms for the production of Late Archaic dart points (Mallouf 2013:146), the McHam cache is here considered to be illustrative of the transitory lifeway practiced by Elephant Mountain populations through time.

References Cited

Albritton, Claude C., Jr., and Kirk Bryan
1939 Quaternary Stratigraphy of the Davis Mountains, Trans-Pecos Texas. *Bulletin of the Geological Society of America* 50:1423–1474.

Boren, Roger
2012 The Early Archaic Cultural Period in Eastern Trans-Pecos Texas. *Journal of Big Bend Studies* 24:105–150.

Campbell, Thomas N.
1940a Sheep Creek Site. In *The Association of Archaeological Materials with Geological Deposits in the Big Bend Region of Texas*, pp. 94–107. West Texas Historical and Scientific Society Publication 10, Sul Ross State Teachers College, Alpine, Texas.

1940b Calamity Creek Site. In *The Association of Archaeological Materials with Geological Deposits in the Big Bend Region of Texas*, pp. 107-117. West Texas Historical and Scientific Society Publication 10, Sul Ross State Teachers College, Alpine, Texas. Center for Big Bend Studies

1996 Proposal for the Conducting of an Archaeological Field School at Elephant Mountain Wildlife Management Area. Document on file, Center for Big Bend Studies, Sul Ross State University, Alpine, Texas.

n.d. Site 41BS814, Elephant Mountain WMA, 1988. Documentation on file.

Cloud, William A.
1996 *Elephant Mountain Wildlife Management Area Campground Project, Brewster County, Texas*. Report submitted to Elephant Mountain Wildlife Management Area, Texas Parks and Wildlife Department, June 1996.

n. d. Archaeological Survey for the Calamity Creek Realignment Project. Letter report submitted to Elephant Mountain Wildlife Management Area, Texas Parks and Wildlife Department, January 1996.

2002 *Archaeological Survey Along a Proposed Fiber-Optic Line Route at Elephant Mountain Wildlife Management Area, Brewster County, Texas*. Reports in Contract Archaeology 4, Center for Big Bend Studies, Sul Ross State University, Alpine, Texas.

Cloud, William A., Richard W. Walter, Charles D. Frederick, and Robert J. Mallouf
2016 *Late Paleoindian Occupations at the Genevieve Lykes Duncan Site, Brewster County, Texas*. Journal of Big Bend Studies 28:1–81.

Collinsworth, Bart D.
1985 The Recognition and Depositional Setting of an Ancient (Eocene) Lacustrine Deposit, Brewster County, Texas. Unpublished master's thesis, Sul Ross State University, Alpine, Texas.

Davis, Mike
n.d. Elephant Mountain Reconnaissance. Documents on file, 1988–1989. Center for Big Bend Studies, Sul Ross State University, Alpine, Texas.

Goldich, Samuel S., and Morris A. Elms
1949 Stratigraphy and Petrology of the Buck Hill Quadrangle, Texas. *Bulletin of the Geological Society of America* 60:1133–1182.

Hardin, George Cecil, Jr.
1942 Geology of Elephant Mountain and Vicinity, Trans-Pecos Texas. Unpublished Master's Thesis, Department of Geology, University of Wisconsin.

Houk, Brett A., and Kerri S. Barile
2000 *The Big Bend Telephone Company Archaeological Survey: Three Exchanges in Brewster, Presidio, and Val Verde Counties, Texas*. SWCA Cultural Resource Report 00-127, SWCA Inc. Environmental Consultants.

Howard, Margaret
1997 Investigation of Archaeological Site 41BS1228 on Route of Proposed Fence, Elephant Mountain Wildlife Management Area. Texas Parks and Wildlife Department, Austin.

Ing, J. David
1997 Proposed Fence Construction in Elephant Mountain Wildlife Management Area. Cultural Resource Program files, Texas Parks and Wildlife Department, Austin.

Kelley, J. Charles

n.d. Documents on file. J. Charles Kelley Archive, Center for Big Bend Studies, Sul Ross State University, Alpine, Texas.

1937 Ancient Man in the Texas Big Bend Region. Unpublished in-house document on file, J. Charles Kelley Archive, Center for Big Bend Studies, Sul Ross State University, Alpine, Texas.

Kelley, J. Charles, T.N. Campbell, and Donald J. Lehmer

1940 The Association of Archaeological Materials with Geological Deposits in the Big Bend Region of Texas. *West Texas Historical and Scientific Society Publication* 10, Sul Ross State Teachers College, Alpine, Texas.

Mallouf, Robert J.

1985 A Synthesis of Eastern Trans-Pecos Prehistory. Unpublished Master's Thesis, Department of Anthropology, University of Texas at Austin.

1995 Arroyo de las Burras: Preliminary Findings from the 1992 SRSU Archaeological Field School. *Journal of Big Bend Studies* 7:3–39.

2012 Paleoindians at the Searcher Site. *La Vista de la Frontera* 23:3. Center for Big Bend Studies, Sul Ross State University, Alpine, Texas.

2013 The McHam Cache: A Prehistoric Stone Assemblage from Calamity Creek, Brewster County, Texas. In *Archaeological Explorations of the Eastern Trans-Pecos and Big Bend: Collected Papers, Volume 1*:115–152. Papers of the Trans-Pecos Archaeological Program 6, Sul Ross State University.

Mallouf, Robert J., and John D. Seebach

2006 Filling in the Blanks: Early Paleoamericans in the Texas Big Bend. *Current Research in the Pleistocene* 23:124–127.

Mandel, Rolfe D.

2002 Late Quaternary Alluvial Stratigraphy in Calamity Creek Valley, Elephant Mountain Wildlife Management Area. In *The Geology of Big Bend National Park: What Have We Learned Since Maxwell and Others (1967) Field Trip Guide*, John C. White (ed), pp. 6–10. Geological Society of America.

McAnulty, William N., Sr.

1955 Geology of Cathedral Mountain Quadrangle, Brewster County, Texas. *Bulletin of the Geological Society of America* 66:531–578.

Peabody, Charles
1909 Reconnaissance Trip Through Western Texas. *American Anthropologist* 11:202–216.

Ray, Cyrus N.
1939 Some Unusual Abilene Region Burials. *Bulletin of the Texas Archeological and Paleontological Society* 11: 226–250

Smith-Savage, Sheron
1989 Memorandum to Herb Kothmann regarding Chalk Valley house. Elephant Mountain Wildlife Management Area, Texas Parks and Wildlife Department, Austin.

Texas Parks and Wildlife Department
1996 Management Plan, Elephant Mountain Wildlife Management Area. Cultural Resource Program files, Texas Parks and Wildlife Department, Austin.

The Sul Ross Skyline
1937 Bones Shipped to Harvard. October 27, 1937.

1938a Sul Ross, Harvard Join Forces in Indian Camp-Site Excavations. January 26, 1938.

1938b Harvard Man Joins Expedition. February 23, 1938.

1938c Two Archaeologists Join Expedition. February 23, 1938.

Tunnell, Curtis
1992 Victor J. Smith: Pioneer Archeologist. *Journal of Big Bend Studies* 4:33–42.

Woodbury, George
1937 Notes on Some Skeletal Remains of Texas. Anthropological Papers 1 (15), *University of Texas Bulletin* 3734, Austin.

Wulfkuhle, Virginia A.
n.d. Documents on file, 1988–1989. Center for Big Bend Studies, Sul Ross State University, Alpine, Texas.

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