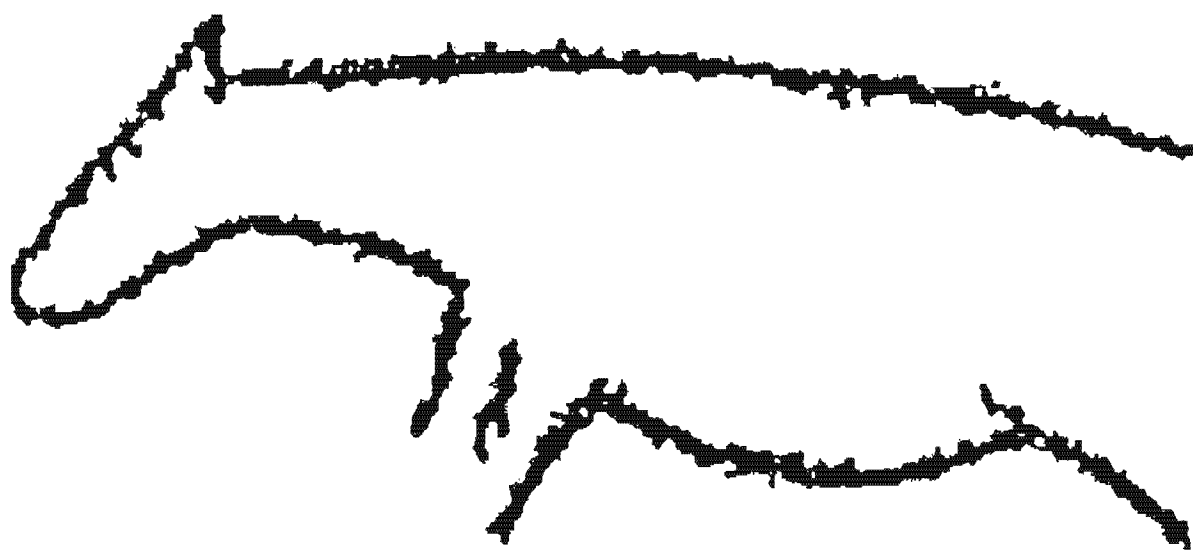


ANCIENT ECHOES



VOLUME 4
2007

JOURNAL OF THE
HILL COUNTRY
ARCHEOLOGICAL
ASSOCIATION

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Bryant Saner, Jr., Editor

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ABOUT THE COVER: Drawing made from a pictograph at the Hatfield Shelter, 41KR493 by Bobby Rector

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This journal is a gift to HCAA from E. Thomas Miller in memory of Bobby Rector.

**This volume of the *Ancient Echoes* is dedicated to the
Memory of Robert “Bobby” Rector**



January 25, 1947-June 2, 2007

It is with much sadness that we noted the passing in June of this year of one of the Hill Country Archeological Associations charter members, Robert “Bobby” Rector. He earned a Master in Anthropology in 1996 from the University of Texas at San Antonio. As a Professional archeologist Bobby formed Rector and Associates Archeological Consulting Services. He was instrumental in the formation of the HCAA. He was on the board and served as archeological consultant to the group. Several early field projects were initiated and lead by Bobby. His ability to do perfect field sketches and drawings amazed us all.

His knowledge and skill as an archeologist were never more evident than in his writing. His Master’s Thesis was on acorn harvesting by indigenous people of the Texas Hill Country. He also wrote all the articles for the first volume of *Ancient Echoes* in 2001 and contributed to other volumes.

Bobby actively participated in archeological fairs sharing his knowledge of foods derived from plants that were utilized by the early Native Americans. He lent his artistic talents to illustrations and posters still used by HCAA. He designed the horse for the HCAA logo. Everyone not only knew Bobby as a talented archeologist and artist but as a genuinely good person and friend. He will be greatly missed.

ARCHEOLOGICAL SURVEY OF APPROXIMATELY 340 ACRES IN NORTHEAST KIMBLE COUNTY, TEXAS

Bryant Saner, Jr.

ABSTRACT

In March of 1998, an archeological survey was started on 340 acres of rangeland in Kimble County, Texas. It was completed in June of 2006. A large number of sites and features were seen in the survey area. The survey was surface only; no excavation was done. A description of the sites and features is given. Diagnostic artifacts, both functional and temporal, were collected. Analysis of the artifacts are found in Appendix A.

INTRODUCTION

An archeological survey was conducted in northeast Kimble County, Texas, on approximately 330 acres out of an approximately 2,000-acre ranch. A 10-acre tract on an adjacent ranch is also part of the survey. This 340-acre tract was chosen due to the proximity of the Llano River, a large drainage, referred to as the drainage, having a permanent water source and close to a number of sites seen in the survey area during a pre-survey walk through. This drainage goes south to north and empties into the Llano River. The draw has a permanent water source. The survey area consists of valley, valley wall, upland edge and upland settings. This setting contained twenty-one prehistoric sites. A possible historic site was found near where Edwards Draw flows into the Llano River. It was not documented due to lack of identifiable material.

Archeological surveys are different than surveys to determine boundary and the number of acres in a tract of land. The archeological survey was designed to find prehistoric and historic archeological sites. Prehistoric sites consisted of burned rock middens (BMR), fire-cracked rock (FCR) scatters, hearths, quarry, workshops/lithic scatters, mortar hole clusters and rock shelters. All of these types were found during the survey. Several had more than one type of feature while others had more than one feature of a single type. Historic sites are any building, structure, camp or other area that was utilized from the time Europeans arrived to 50 years ago.

ENVIRONMENTAL SETTING

The survey area is located in the northeast portion of Kimble County in an upland, upland edge, valley wall and valley type setting. The valley is in a flood plain and fossil flood plain. The general soil type is Menard-Hext-Laton that is found on the upland plains, low ridges and knolls. Menard soils are brown, fine sandy loam. Hext is generally a reddish-brown, moderately alkaline, fine sandy loam. Laton soils are reddish brown-,gravelly, moderately alkaline, fine sandy loam. Shep clay loam is also in the flood plains of drainage near the Llano River. It is calcareous,

moderately alkaline brown-clay loam (Blum and SCS, 1982:54-56).

The average yearly rainfall is 22.5 inches in Kimble County. The month of May generally has the most rain with a monthly average of 3.28 in. December and January generally have the lowest average monthly rainfall of .95 in. The month with the average lowest temperature is January at 31.7 degrees F. July has the average highest temperature with 96.7 degrees F (Bomar 1990:212-222). Cedar, live oak, mesquite, cactus, agarita, yucca-type plants and native grasses are the common types of vegetation species in the survey area.

PREHISTORIC BACKGROUND

The Edwards Plateau has been occupied by humans for at least 11,000 years (Turner and Hester 1999:51). It is possible the area was occupied as early as 11,500 years ago (Collins 1995:380). The area can be divided into four major cultural time periods: Paleoindian, Archaic, Late Prehistoric and Historic periods. Each of the major periods can be subdivided. Each period is marked by changes in environment, food, tools and location of sites. The projectile points are temporally diagnostic and provide a time line for sites and areas within the Edwards Plateau.

The Paleo-Indian Period lasted from about 11,500 years ago to 8,000 years ago. During this period humans lived on the same terrain with large mammals such as mammoths, mastodons and large bison. The people of this period most likely scavenged these large mammals, but they were also hunted. Small animals were hunted and many types of plants were part of the Paleo-Indian diet (Collins 1995:381). The mammoths and mastodons disappeared in the early part of this period. The large bison were gone by the end of this period. The inhabitants began to rely on medium to small animals for food as well as plants (Mauldin and Nickels 2001:57). The first half of this period was highlighted by the fluted Clovis projectile point followed by the fluted Folsom projectile point. Plainview, Golondrina, Barber and Angostura were seen in the later half of this period (Turner and Hester 1999). A cool and moist climate was evident during most of the Paleoindian Period, while toward the end of this period the climate changed to a dry and warm (Collins 1995:377).

The Early Archaic Period was 8,000 years ago to about 4,500 years ago (Turner and Hester 1999:55). The climate shifted from a wet and moist climate to one that was dry and warm one. However, a slightly cooler and moister climate was seen between about 6,500 years ago to about 6,000 years ago. At the end of this short period, the climate returned to hot and dry conditions (Collins 1995:377). Plant food was a large part of the diet and smaller animals were hunted (Prewitt 1981:73). Burned rock middens are first seen late in this period (Collins 1995). Andice, Bell, Gower, Martindale, Uvalde, and Wells dart points are in use, along with Clear Fork and Guadalupe gouges (Prewitt 1981:77-79).

The Middle Archaic Period was from approximately 4,500 years ago to about 3,000 years ago (Turner and Hester 1999). Prewitt (1981:80) states the Middle Archaic ended about 2,250 years ago. The climate started as dry and hot changing to cool and moist by the end of the period (Collins 1995:377). An increase in the number of sites and lithic artifacts are seen, showing an increase in population. Cemeteries are seen late in this period indicating some territorial tendencies among the inhabitants. The number of burned rock middens increased rapidly,

indicating heavy plant processing. Hunting continues to be an important food source as indicated by the large number of projectile points found at Middle Archaic sites. Near the end of the period a slight shift is seen towards gathering. Bulverde, Nolan and Travis dart points are seen in the early part of the period. Pedernales, Marshall and Lange are common dart points seen throughout this time (Prewitt 1981:79-81).

The Late Archaic Period lasted about 1,000 years from about 2,250 to about 1,250 years ago (Prewitt 1981:80-81). Collins (1995:384) states this period lasted from approximately 4,000 to 800 years ago. Turner and Hester (1999:57) date the Late Archaic from 3,000 to 1,700 years ago and describe the period from 1,700 to 1,300 years ago as the Transitional Archaic. The climate was cool and moist for all of this period (Collins 1995:377). Processing of plants for food continued with an increased emphasis on gathering. Bison were present at the beginning of the period, but not in substantial quantities and may have decreased even more by the end of the period (Prewitt 1981). Castroville, Marcos and Montell dart points were seen in the early portion of this period. Ensor, Frio and Fairland were common in the later portion (Collins 1995:376). These dart points are generally smaller than those seen in the early portion of the period (Johnson 1995:98). Turner and Hester (1999:57) described the small dart points as part of the Transitional Archaic Period.

The Late Prehistoric Period began about 1,250 years ago and lasted until about 200 years ago. The early part is known as the Austin Phase lasting from about 1,250 to about 650 years ago. The later part of the Late Prehistoric Period is the Toyah Phase. This period lasted from about 650 years ago to about 200 years ago (Prewitt 1981:82-84). At the beginning of this phase the bow and arrow made an appearance and the atlatl and dart point fell out of favor. Burned rock middens continued in use, especially in the western Edwards Plateau. They accumulated at a slower rate than the previous period. Edwards and Scallorn arrow points were common in the Austin Phase (Collins 1995:376). The Toyah Phase was marked by the buffalo once again being an important food source (Turner and Hester 1999:61). The phase was characterized by locally-made pottery called Leon Plain, Perdiz arrow points, thin bifaces, end scrapers and prismatic blades. These tools and pottery were most likely associated with bison hunting (Collins 1995:385). Burials from the Late Prehistoric Phase show more arrow points as the cause of death. This may indicate an increase in warfare between groups in this period (Johnson 1995:99). The climate in the period was cool and moist and changed to warm and dry by the end (Collins 1995:377).

The Historic Period started when Europeans arrived in Texas, but the exact time is not agreed upon. Collins (1995:386) believes it to be about 250 years ago, while Turner and Hester (1999:61) infer that it began about 400 years ago, with the early part called the Protohistoric Period. This period was a time when Europeans first arrived in the western hemisphere, but had little or no effect on the indigenous people. It was about 500 to about 250 years ago (Hester 1995:449-450).

The early part of the Protohistoric Period was characterized by the continued use of flint for tools and arrow points. The life style was similar to the previous period. The last remnants of the Toyah Phase may have extended into the Protohistoric Period (Turner and Hester 1999:61). The European settlers arrived in Texas during the later part of the Historic Period about 250-300 years ago. The Spanish established themselves in Texas at a time when the Southern Plains

Indians were being pushed into South Texas by other groups of Indians from the north and west. They were also being pushed west by advancing Europeans from the east coast and by the Spanish from the south. The disrupted groups moved into Central and East Texas. During this time many Native American groups began to obtain European ceramics, metal, guns and most importantly, horses. Flint arrow points were being replaced by metal arrow points and guns. The Europeans brought diseases that were devastating to the Indians. Some Indians went to Spanish missions (Collins 1995:386-387). No indigenous Indians were living in the Hill Country area by the early to mid-19th century. Indian raids into this area were common from the early to mid-19th century (Black and McGraw 1985:40).

PREVIOUS INVESTIGATION

Several archeological investigations have been conducted in this area. These provide a comparison with the survey area. Clues to when the site was inhabited, function of the components, sustenance and climate can be derived. A study of the mortar holes on the survey track was conducted during the investigation. An archeological study of burned rock middens was conducted by the Texas Archeological Research Laboratory at the University of Texas at Austin in conjunction with the Texas Department of Transportation (TxDOT). One of the sites was in west Mason County (Black et al 1997). In the mid-1980s the Texas State Department of Highways and Public Transportation (now TxDOT) conducted an archeological investigation in east central Kimble County in preparation for widening a highway (Young 1986).

An analysis of the bedrock mortars on three sites in the survey area was undertaken. Classification of the mortar holes by shape gave insight into the function of the mortars. The location of the mortar holes was deemed important. This report adds to the small amount of data on mortar hole function in the Kimble County area (Saner and Hixson 1999).

Honey Creek Site, 41MS32, in west Mason County was one of four sites in Central and South Texas used to study the function of burned rock middens. There are two burned rock midden sites in McCulloch County and one in Uvalde County along with the Mason County site that were used in the study (Black et al 1997).

In 1980, five sites that consisted of three middens and three procurement areas were tested along a road right-of-way in eastern Kimble County. The sites with middens yielded cultural debitage. Diagnostic dart points spanned the Early, Middle and Late Archaic periods. Several arrow points were also recovered. Most of these were Perdiz. An Alda-like arrow point was also found. Several pottery sherds were found in a field on private property next to one midden, indicating a possible Toyah site. This archeological investigation provided data on Archaic and Neo-American (Late Prehistoric) periods and on the relation between the Trans-Pecos area and Archaic west central Texas (Young 1986).

FIELD METHODOLOGY

The survey consisted solely of a surface inspection. No excavations took place. A few

artifacts were collected if they provided functional and temporal data. All artifacts were be returned to the landowner at the conclusion of the study.

The Llano River, fence lines and an arbitrary line were used to set the boundary of the survey area. The north boundary was the south bank of the Llano River. The fenced property line delineated the boundary on the west and south sides. The east boundary was an arbitrary line drawn on a map from the easternmost end of the southern boundary to the easternmost end of the northern boundary. The surveyors set the boundary so upland, upland edge, valley wall, valley and stream bed of the drainage would be included in the survey.

Open areas were surveyed using transects 10 to 30 m apart. Transects 10 m apart were used in brushy areas where visibility was low. In open areas 30 m transects could be used. In the very rugged and brushy areas random transects were used. The survey area was well covered.

When a site was discovered, it was given a field ID number, measured, mapped and notes written so the site data form could be completed. Collected artifacts were given an artifact number and placed in a plastic zip lock bag. All artifacts that were not found on a designated site were classified isolated finds and given a separate artifact number. The location of the find was placed on the survey map. A Texas Archeological Site Data Form was completed for each site and sent to the Texas Archeological Research Laboratory to be assigned a trinomial. When the trinomial was received, it replaced the field ID.

LAB METHODOLOGY

When the field work portion of the survey was completed, all cultural material recovered during this survey was brought to the home of the principal author. It was washed, dried, sorted into the appropriate categories, tagged and labeled. The categories were lithics, which consisted of projectile points, bifaces, unifaces, cores, edge-modified and debitage. Organic material consisted of bone and mussel shell. All collected artifacts were photographed and drawn. A written analysis of the lithics was done. The bison bones were identified by Barbara Meissner (2002), faunal analyst at the Center for Archaeological Research at the University of Texas at San Antonio. A report of the finding was written. All artifacts were returned to the land owner.

SURVEY AREA

The survey area was approximately 0.53 of a square mile, 340 acres (1.38 square kilometers). It was shaped like a triangle, except for a short, flat boundary on the north end and a zig-zag in the southeast corner. The west boundary started at the Llano River and went south for approximately 1,750 m. Then it went north northeast for approximately 800 m, then east southeast about 490 m and then north about 400 m. The boundary went northwest for approximately 1,650 m to the edge of the Llano River. It then went 125 m southwest along the southern bank of the Llano River where it turned west for 275 m continuing along the south bank of the river. At the west end it joined the northernmost end of the western boundary.

The drainage was a seasonal creek except for a permanent spring approximately 500 m

north of the southern boundary. Two small tributaries entered the area at the south central and southwest boundary. The drainage entered at the south boundary and meandered through the center and exited the survey area after it zig-zaged its way to the north boundary where it emptied into the Llano River. In times of above average rainfall water can be seen in various portions of the creek.

DESCRIPTIONS OF SITES

A total of 21 sites were found and recorded during the survey. There are 247 features on the 21 sites recorded (Table 1). A variety of temporal diagnostic artifacts that ranged from 8,800 to about 500 years old were recovered. Stone artifacts used for grinding, crushing, scraping and cutting were also recovered (Table 2). Some of these artifacts can be seen in figure 4.

The sites in the northern end of the survey area were mostly located on alluvial soils probably washed in by the Llano River. The northern boundary was the southernmost end of an oxbow in the river. The drainage had gravels and cobbles in the bed. There was some valley wall, and upland edge terrain on the northeast portion of this area.

The southern portion of the survey area had most of the exposed limestone and bedrock. Accumulation of alluvial soil was much less. Valley wall, upland edge and upland sites were more common here. The draw had much less gravels and cobbles and more exposed bedrock creek bottom.

41KM146

This site is on a level to gently rolling upland setting about 100 m N/S x 200 m E/W. A permanent water source is at the base of an approximate 10.0-12.0 m bluff on the north end of the site. The ranch owner, Ted Smith, states he has never seen this hole without water. An unnamed drainage is the eastern boundary of the site. The west boundary is an eroded drainage area about 5.0-8.0 m in depth. The southern boundary is the southern limits of BRM-4.

Five BRMs were seen, one large and four medium in size. Most have been partially scraped by bulldozing. This probably happened in the mid-1990s when the land was cleared of cedar and brush (Ted Smith, personal communications). Four clusters of mortar holes and/or grinding facets and a mussel shell concentration were discovered during the survey.

BRM-1 is the largest of the middens. It is in the northern end of the site. It is 9.0 m N/S x 12.0 m E/W and 60-70 cm in height. There is a concentration of fresh water mussel shells 4 m north of BRM-1. Cluster D made up of seven of the mortar holes and grinding facets was 12.0 m west of BRM-1 (Fig. 1). There were 15 diagnostic dart points, tools and biface fragments found around BRM-1.

BRM-2 is about 100 m south-southwest of BRM-1. The terrain is sloping gently to the east. The dimensions of this BRM are 5.0 m N/S x 9.0 m E/W and 15 cm in height. No artifacts, mortar holes or grinding facets were seen near or in the vicinity of this feature.

BRM-3 is about 20 m east of BRM-1. It has been scraped by bulldozing. The dimensions are 5.0 m N/S x 3.0 m E/W with a height of 10 cm. Two biface fragments, a Langtry and two Pedernales and three unidentified dart points were recovered near this feature.

BRM-4 is a large hearth or small BRM located about 190 m south-southwest of BRM-1. The dimensions are 7.0 m N/S x 5.0 m E/W with a height of 5-8 cm. This feature was also scraped by bulldozing. No mortar holes or grinding facets were seen in the vicinity of BRM-4. Twelve lithics were recovered near this feature, five Nolan dart points, a Bulverde dart point stem, two unidentified dart points, two biface fragments and two edge-modified flakes.

BRM-5 was about 65 m southwest of BRM-1. The dimensions are 4 m N/S x 5 m E/W with a height of 5-8 cm. A concentration of mussel shell and fragments was seen on the north side of this feature. A total of five artifacts were recovered, three biface fragments, one biface preform and one arrow point preform.

Four clusters of mortar holes were found across the north end and northeast side of the site (Fig. 1). Cluster A is the northernmost feature here at 35.0 m north of BRM-1. It has eight mortar hole/grinding facets that are very near the 10.0-12.0 m bluff overlooking the permanent water hole. There were four bowl-shaped grinding facets, three conical mortar holes in natural basins and one conical mortar not in a natural basin. Cluster B was about 30.0 m north-northeast of BRM-1 and has three bowl-shaped grinding facets. Cluster C was about 40.0 m south of BRM-1 and had four mortar hole/grinding facets. Two were bowl-shaped, with one on the surface of a flat rock. One of the remaining two was a conical mortar hole in a natural basin and the other was conical in bedrock. Cluster D was 12 m west of BRM-1 and consisted of seven mortar holes/grinding facets. Three of the seven were conical in natural basins; two were bowl-shaped grinding facets, one was oval at the top and conical at the bottom and the last one was conical (Saner and Hixson 1999).



Figure 1: Mortar holes 18 and 19, Cluster D, near BRM-1 on 41KM146.

41KM147

This site was a rock shelter that is on drainage about 250 m north of 41KM146. The southwest boundary is an approximate 10 m rock bluff that had a slight overhang. The northeast boundary is the drainage. The distance from the bluff to the draw is 14.0 m. The southeast and northwest boundary is the point at which cultural material is no longer present on the surface. This was a distance of 22.0 m. There was a rise of about 1 m from the drainage up to the bluff wall. A place on the southeast boundary was noted where water drained down the bluff from above in wet weather. It has caused some erosion to that end of the site. The remnants of a hog trap were present near the southeast end of the site at the bluff.

A tertiary flake and a secondary cortex flake with edge modification were recovered close to the hog trap remnants. Three metate and two mano fragments were recovered near the creek on the south portion of the site.

41KM148

This site is a BRM and surrounding occupational area. It was on a slightly sloping terrain between a permanent spring and a steep rise. The spring is about 24 m to the west, and the steep rise is 20 to the north. The rise is the east boundary of the site.

The BRM is 17.0 m N/S x 18.0 m E/W. The rise on the west side is about 1.2 m, while the rise on the east side is about 40 cm. A hole 20-25 cm was seen on the BRM. It was created when a tree was bulldozed. A few primary and secondary cortex flakes were noted on the site. Tertiary flakes along with several edge modified-flakes were seen. A quartzite mano that was also used as a hammer stone was recovered. A sandstone mano in two pieces and sandstone metate fragment were collected. Three edge modified-flakes were collected. The only diagnostic artifact recovered was a Bulverde dart point stem.

41KM149

This site was located on a point where an unnamed drainage flow into the drainage. A concentration of 38 mortar holes and grinding facets in limestone bedrock and large limestone boulders were found here. Some of these were in basins that had been naturally formed. The dimensions of the site were 23.0 m N/S x 15.0 m E/W. Several pieces of debitage were noted at this site. It is in a flood plain so it is possible these artifacts washed into the site.

41KM150

This site is in and on the east and west sides of the drainage. It is comprised of 66 mortar holes and grinding facets and two BRMs. BRMs 1 and 2 are on the east side of the draw along with ten mortar holes and grinding facets. Three mortar holes are in a large boulder on the northwest end of the site. The remaining mortar holes and grinding facets are in bedrock in the drainage.

The dimensions of the site were 60 m N/S x 35 m E/W. BRM-1 was 9.0 m in diameter and 20-30 cm. The north edge spilled into a small drainage that emptied into the drainage. BRM-2 is 10.0 m in diameter and has a height of about 30 cm. Ten mortar holes and/or grinding facets are seen on the east side beginning at the southeast edge going south. Site 41KM162 should have been part of this site. However, when 41KM150 was surveyed, permission to cross the fence on

the south edge of the site had not been obtained. The land on the south side of the fence was owned by a different person.

A utilized flake, utilized biface, chopper with hammer stone use, sandstone metate and sandstone mano fragments and the proximal half of a Langtry dart point were all recovered on the east side of the drainage.

41KM151

This site is on terrain that sloped to the west towards the drainage near where it emptied into the Llano River. The river was about 100 m north. There is a ranch road that goes through the southern portion of the site with another road branching off to the north. The branch goes through the east half of a mussel shell concentration. There is a large (BRM-1) and a small (BRM-2) burned rock midden. Two hearths, FCR scatter, fresh water mussel shell concentration, a flint procurement site and two clusters of mortar holes are seen at the site. The large cluster has 7 mortar holes while the small one had 4. BRM-1 was 21.0 m N/S x 19.0 m E/W, BRM-2 was 8.0 m N/S x 5.0 m E/W, Hearth-1 was 45 cm N/S x 55 cm E/W, Hearth -2 was 1.2 m in diameter and the mussel shell concentration was 11.0 N/S x 6.0 m E/W.

A thin, long and narrow piece of sandstone was found in mortar hole 6. Six edge-modified tools, chopper, five biface fragments and a sandstone mano were recovered.

41KM152

This site is on a finger of land with the Llano River on the north side, the drainage on the south and east, and a hill on the west. The land form is a levee created on the outer oxbow curve of the river. The surface is level on top and sloped to the river on the north. Cut banks created by drainage are seen on the south side. Several erosional drainage areas created by water flowing south off this land form and into the draw were seen. Areas of cultural debris are seen in the cut bank and erosional areas.

The land form is about 200 m N/S x 400 m E/W on which 21 features were recorded. FCR scatters are most common followed by hearths. There are 11 FCR scatters ranging in size from 2.5 m x 1.5 m to 11.0 m x 3.0 m. There are 6 hearths that ranged in size from 1.0 m in diameter to 3.5 m in diameter. The BRM is in the southwest corner of the site and is 27.0 m x 18.0 m E/W. The surface of the site was eroded. The south end of the BRM was eroding into the drainage. A concentration of fresh water mussel shells were found near the west boundary. It is 1.5 m N/S x 2.0 m E/W. A lens of FCR and dark soil is seen between an upper layer of light tan soil and a lower layer of reddish-tan soil is seen about 35.0 m southeast of the BRM. It is about 40 cm thick and about 7.0 m in length. The top of the lens ranged from 80 cm to 130 cm below the surface. A roll of modern barbed wire was seen in the northwest portion of the site. It was recorded, but not collected.

A Nolan dart point was recovered a few meters north of the BRM. A Pedernales dart point fragment was recovered at the north central portion of the site. Edge-modified artifacts are most common with five specimens collected followed by biface fragments with four and one core tool. Fresh water mussel shells are scattered throughout the site. Three specimens from various locations on the site were collected including one from the shell concentration.

41KM153

This site is located on the south side of the drainage in the southern portion of the survey area. There were five features and an isolated find seen on the first terrace and a rising up to the second terrace above drainage. Two BRMs and three hearths were mapped. BRM-1 is in the center of the site, while BRM-2 is at the east edge. Hearth-1 is at the west edge, Hearth-2 is between Hearth-1 and BRM-1 and Hearth-3 are south of BRM-1 and west of BRM-2.

The site is 23.0 m N/S x 82.0 m E/W and paralleled the drainage. BRM-1 is 6.0 m N/S x 7.0 m E/W x 30 cm in height while BRM-2 is 6.0 m N/S x 7.5 m E/W x 15 cm in height. Hearth-1 is 3.0 m N/S x 4.0 m E/W, Hearth-2 is 1.0 m N/S x 5.0 m E/W and Hearth-3 is 3.5 m N/S x 4.5 m E/W.

An edge-modified scraper and a possible Guadalupe tool were found near Hearth-1. An edge-modified flake and an Enser dart point were found near BRM-1. An isolated find, a biface, was recovered about 30.0 m west of Hearth-1.

41KM154

This quarry and lithic scatter site is located on the second terrace on the west side of the drainage and across from 41KM150. The northwest end is one terrace above 41KM153. This site is separated by physical boundaries, otherwise it would have been part of 41KM150. The terrain slopes to the northwest and southwest. A fence goes through the southeast end. The dimensions are 85.0 m NW/SE x 52.0 m NE/SW.

Flint of various colors is scattered across the site. Various size flakes, some edge-modified along with several cores are seen. An Edgewood dart point, unidentified dart point, preform and a core were collected.

41KM155

This is a quarry and site on slightly sloping terrain. A fence goes through the north end of the site. The dimensions are 52.0 m N/W x 10.0 m E/W. Flint cobbles, several cores, flakes of various sizes, types and colors were seen. Two edge-modified flakes, one shave, flint, cobble, hammer stone and a biface were collected.

41KM156

This site is located on a point of land on the east side of an unnamed drainage where it flowed into the drainage. The terrain is in an active flood plain. It contained three hearths. Hearth-3 may have been built on top of an old hearth. Cores along with small to medium size secondary and tertiary flakes, some edge-modified, are seen. The dimensions of the site are 14.0 m N/S x 30.0 m E/W. The hearths are about 1 m in diameter. An edge modified-flake and a biface were collected.

41KM157

This lithic scatter site is located on a bluff overlooking the drainage. The dimensions are 21.0 m NW/SE x 19.0 m NE/SW. Small to medium secondary and tertiary flakes and several edge modified-flakes were seen. Two edge-modified, a biface, a biface fragment and a possible

Paleo point fragment were collected. The Paleo point fragment may be the proximal end of an Angostura dart point.

41KM161

This site is located on a teardrop-shaped portion of land that is surrounded on the south, west and north sides by drainage. The east side boundary is a hill. The site starts at the base of the hill and follows the contours close to the creek on the north and south edge. The distance is 50 m. The west boundary is 110 m from the base of the hill, but did not go all the way to the creek. There was a ranch road that went through the center of the site.

The site consisted of 12 features. They are two BRMs, three hearths, five FCR scatters/concentrations and two areas of FCR eroding out of the cut bank above the creek.

BRM-1 was in the east central portion of the site. It was 11.5 m N/S x 10.0 m E/W with a rise of 70 cm. Grass and leaf cover made ground visibility very difficult.

BRM-2 is in the southeast corner of the site. It was partially eroded. The dimensions of the site are 3.4 m N/S x 3.8 m E/W with no rise noticed. Scattered flakes, sandstone cobbles, occasional mussel shell fragments were seen.

Feature-1(F-1) is a hearth located in the northeastern portion of the site. It is on the edge of the ranch road. Dimensions were 1.2 m N/S x 0.9 m E/W.

Feature-2 (F-2) is an FCR concentration just north of F-1. Several cores, flakes of various sizes and types and mussel shells are noted on and around feature.

Feature-3 (F-3) is a hearth located south of F-2 near the northeast corner of the site. It is on the edge of the ranch road. It is 1.8 m N/S x 1.6 m E/W. Going down a slight slope from the north side was an FCR scatter that was 7.0 m N/S x 3.0 m E/W.

Feature-4 (F-4) is located between BRM-1 and BRM-2. It is 1.2 m N/S x 70 cm E/W. It is buried with large FCR exposed. It appeared intact.

Feature-5 (F-5) is located north of BRM-2 in the southeast portion of the site. It is an FCR scatter 8.0 m N/S x 12.0 m E/W.

Feature-6 (F-6) is located at the middle of the south boundary in a drainage area. FCR is eroding out of a cut bank. No dimensions available.

Feature-7 (F-7) is an FCR scatter located just west of F-6. It is 3.5 m in diameter. Several tertiary flakes were noted nearby.

Feature-8 (F-8) is an FCR scatter southwest of F-7 located near the cut bank. Most of it is on the flat surface with a small portion eroding from the cut bank. Small FCR is seen eroding from the cut bank below the feature. It is 18.0 m N/S x 14.0 m E/W.

Feature-9 (F-9) is located in the northwest corner of the site. It consisted of two lenses of FCR eroding from cut bank. The first is 30 cm in length x 10 cm in thickness. The second is 70 cm in length x 10 cm in thickness. Both start at the surface. One mussel shell specimen was collected.

41KM162

This site is located south of 41KM150 and should have been part of it. However, it is located on land not owned by the Smith family. Permission was obtained at a later date to enter this area only. The site is on the west side of the drainage and slopes toward it. Four BRMS

were identified. There is an area of FCR that is spread out and leveled that may have been another BRM.

BRM-1 is 23 m south of the drainage. It was 17.0 m N/S x 23.0 m E/W with a 60-70 cm rise. A ranch road ran through the southeast edge of the BRM. Debitage was seen across the BRM along with a few pieces of sandstone. A small crushing/pounding chert tool with heavily battered edges was collected.

BRM-2 is about 9.0 m south southwest of BRM-1. It was 12.0 m N/S x 13.0 m E/W with a 40-50 cm rise. On the west side of BRM-2 is an area scooped out by a front end loader about 4.5 m wide and 3.0 m into the midden. The dirt that was removed is piled off the midden near the edge. A sandstone mano fragment was found near the north edge of the midden, but not collected. An edge modified, probable scraper, was found and collected near the mano fragment.

BRM-3 is about 40.0 m east of BRM-2. It is 14 m N/S x 17.0 m E/W with a rise of 40-50 cm. There are two collector holes and a small backhoe trench on and around the midden. Collector hole #1 is on the east edge. It is 1.5 m long, 1.0 m wide and 0.8 m deep. Gray-brown soil with some FCR is seen in the walls and floor. The second collector's hole is just off the southwest edge. It is 2.7 m long, 1.5 m wide and 0.3 m deep. Brown sandy soil with some FCR is seen in the walls and floor. The backhoe trench is on the northwest edge of the midden. It is collected. An edge-modified, probable scraper, was found and collected near the mano fragment 3.4 m long x 0.3 m wide and 0.5 m deep. Gray-brown sandy soil is seen along with cultural material.

BRM-4 is located just south of the southern edge of 41KM150 and northwest of BRM-1. It is 12.0 m N/W x 14.0 m E/W with a rise of 30-40cm.

A possible fifth BRM may have existed south of BRM-1 and east of BRM-2. An area 29.0 m N/S x 17.5 m that had FCR and other cultural material. A hematite fragment was collected on the north edge. A sandstone metate with a slightly curved and pecked surface was seen, but not collected on the area. A flint specimen similar to the type found at the quarry site on 41KM151 was found and collected near the northeast edge. Two mussel shells were collected. One was next to the flint specimen. The other was northeast of the area on the south side of the ranch road.

Debitage, consisting of primary and secondary cortex flakes and tertiary flakes, was seen across the site. Sandstone fragments were also seen.

An area of large rocks and boulders was seen about 10.0 m northeast of BRM-1. These contained seven mortar holes. One rock was split in two pieces with half of the mortar hole in each segment.

41KM166

This site is located about 60 m west of 41KM161. There was enough distance between these sites that 41KM166 was given a separate trinomial. The dimension of the site is approximately 52 m in diameter. Five features, 2 hearths and 3 FCR scatters, are Feature-1 (F-1) is an FCR scatter 8.0 m N/S x 9.0 m E/W in the southern portion of the site. Medium to large FCR was seen over the feature.

Feature-2 (F-2) is also an FCR scatter 7.0 m N/S x 9.0 m E/W in the north portion of the site. Medium size FCR, occasionaldebitage, and small to medium mussel shell fragments were

seen on the surface. Three artifacts were collected from the back dirt from an animal burrow. These are a graver, biface proximal fragment and a mussel shell.

Feature-3 (F-3) is a hearth 6.0 m N/S x 5.0 m E/W in the north end of the site. Several conjoined FCR were noted.

Feature-4 (F-4) is an FCR scatter 6.0 m N/S x 5.0 m E/W in the northwest portion of the site. Medium to large FCR were seen, along with several burned sandstone cobbles.

Feature-5 (F-5) is a hearth 12.0 m N/S x 8.0 E/W near the west central boundary. Small to medium size FCR noted. Mussel shell fragments and some debitage were noted. Four artifacts were collected at this feature, an unidentified dart point fragment, chopper/crusher tool, quartzite hammer stone and a quartzite mano.

41KM203

This triangular-shaped site is located in the northwest portion of the survey area. It is surrounded on the north, south and east side by the drainage and on the west a hill. The site has 16 features along the northwest and south edges. There are 16 features: 1 BRM, 5 hearths, 6 FCR scatters, 1 FCR scatter eroding from the cut bank, and 3 hearths eroding from the cut bank.

Feature-1 (F-1) is a hearth near the northwest corner of the site. It is a hearth exposed by erosion. It is 1.0 m N/S x 3.5 m E/W. Small to large FCR, some conjoined, were seen. No other cultural material was seen.

Feature-2 (F-2) is an FCR scatter near the edge of the northwest portion of the site. It was exposed by erosion. The dimensions are 4.0 m N/S x 8.0 m E/W.

Feature-3 (F-3) is a hearth found on a flat surface with an FCR scatter associated with it. The dimensions are 2.5 m N/S x 4.0 m E/W.

Feature-4 (F-4) is an FCR scatter in the northwest portion of the site in a small erosional drainage. The FCR has been widely scattered by erosion so no measurements were taken. Several mussel shell fragments were noted.

Feature-5 (F-5) is a hearth in the northwest portion of the site. This may have been an eroded BRM. It appears much of F-5 has eroded away. A chert mano fragment was recovered here. Several cores were observed, but not collected. The dimensions are 4.0 m N/S x 9.0 m E/W and went 20 cm below the existing surface.

Feature-6 (F-6) is an FCR scatter in the north portion of the site. This is possibly an eroded hearth. Primary and secondary cortex along with tertiary flakes were seen. Several cores were observed and a core/chopper was collected. A small concentration of mussel shell fragments was also noted. The dimensions are 8.0 m N/S x 5.0 m E/W.

Feature-7 (F-7) is a hearth in the north portion of the site exposed by erosion. Small to medium secondary cortex flakes were noted. The proximal half of a thin biface was recovered here. Small mussel shell fragments were seen. Small to large FCR was seen. The dimensions are 2.5 m N/S x 4.0 m E/W.

Feature-8 (F-8) is an FCR scatter in the north portion of the site. Small mussel shell fragments and various types of debitage were noted. A mano fragment was collected. The dimensions are 9.0 m N/S x 7.5 m E/W.

Feature-9 (F-9) is an FCR scatter found in the north portion of the site. It appeared to be

an eroded hearth at the head of a small erosional drainage. The dimensions are 1.0 m N/S x 3.0 m E/W.

Feature-10 (F-10) is an eroding hearth in a cut bank on the south side of the creek in the north portion of the site. FCR was scattered 3.0-4.0 m down the drainage. The dimensions are 1.5 m N/S x 2.5 m E/W. The top of the feature began 10-20 cm below the surface and was 20 cm thick.

Feature-11 (F-11) is a hearth exposed in a cattle trail in the north portion of the site. There is minimal water erosion. The dimensions are 60 cm in diameter.

Feature-12 (F-12) is an FCR scatter exposed by erosion in a cut bank on the north side of the creek in the southwest portion of the site. The feature appeared to begin about 1.0 m below the existing surface. Thickness was not determined. The dimensions are 7.5 m N/S x 0.5 m E/W.

Feature-13 (F-13) is a hearth exposed in a cut bank on the north side of the creek. The top of the cultural material was about 70 cm to 100 cm below the existing surface. The thickness varied between 10 cm to 40 cm. It is 4.0 m E/W. The N/S distance was not determined.

Feature-14 (F-14) is an FCR scatter on the southwest portion of the site. An animal burrow is in the feature and the backfill had FCR. The dimensions are 1.0 m N/S x 1.3 m E/W.

Feature-15 (F-15) is a lens of FCR exposed in a cut bank between 1.7-1.9 m below the existing surface on the north side of the creek in the south portion of the site (Fig 2). This may be a cross section of a small BRM. The length is 6.0 m E/W and it is 20-30 cm thick. N/S distance cannot be determined.

Feature-16 (F-16) FCR cluster, buried 1.2 m below the existing surface in the northeast



Figure 2: Buried FCR and stained soil in cut bank in Feature 15 on 41KM203.

Table 1: Features by Sites

SITES	BRM	FCR Scatter	Mortar Hole/ Grinding Facet	Rock Shelter	Musket Shell Conc.	Hearth	Quarry	Lithic Scatter	FCR Eroded From Cutbank	Hearth Eroded From Cutbank	Total types of features per site	COMMENTS
41KM146	5		22		1						3	
41KM147				1							1	
41KM148	1										1	
41KM149			38								1	
41KM150	2		66								2	
41KM151	2	1	11		1	2	1				6	
41KM152	1	11			1	6					4	
41KM153	2					3					2	
41KM154							1	1			2	
41KM155							1	1			2	
41KM156						3					1	
41KM157								1			1	
41KM161	2	5				3			2		4	
41KM162	4	1*	7								3	*FCR scatter may be bulldozed BRM
41KM166		3				2					2	
41KM203	1*	6				5			1	3	5	*BRM exposed in cut bank
41KM209	1					5					2	
41KM215	2		2								2	
41KM216		*					1	3			3	*Many FCR scatters Not counted
41KM227								1			1	
41KM228								1			1	
Total # of features per site	23	27	146	1	3	29	4	8	3	3		247-Total # of features for survey

Table 1: Number and type of features by site.

portion of the site. It is 50 cm E/W and 10 cm thick. N/S was not determined.

41KM209

The north and south boundary of this site is the drainage. The east boundary is a hill. The west boundary was undetermined. A fence ran north/south on the west end of the land form and permission from the owner was not obtained to survey the area west of the fence. Cultural material was seen on the west side of the fence. A ranch road came off the hill on the east end and ran parallel to the creek on the south side to the fence. Near the fence a road branched off to the south and crossed the creek. The road then turned north and ran along the west fence almost to a fence that ran east/west and ended at the north/south fence on the west end. The road then turned east and paralleled the creek and ended at a deer blind. The east/west fence ran east near the deer blind and turned southeast and continued up the hill at the east boundary.

Six features were found on this land form to which the surveyors had access. They were five hearths and a BRM. The FCR is mostly sandstone. There is a sandstone outcrop on the south side of the drainage across from the south boundary of the site.

Feature-1 (F-1) is a hearth on the west boundary composed of small sandstone FCR. This feature was divided by the fence. Visibility was best in the road on the east side of the fence. There may be more cultural material that was not seen due to poor visibility. Scattered small tertiary flakes were seen. The dimensions are 10.0 m N/S x 3.0 E/W.

Feature-2 (F-2) is a hearth in the northwest portion made up of square sandstone FCR. No other cultural material was noted here. The feature is 12.0 m in diameter. No rise was seen on this feature.

Feature-3 (F-3) is a hearth in the northwest portion of the site. There is a concentration of FCR 0.6 m in diameter with an area of less concentrated FCR extending to about 1.5 m in diameter. The FCR scatter is about 9.0 m N/S x 7.0 m E/W. The FCR was limestone and sandstone.

Feature-4 (F-4) is a hearth in the central portion of the site. It is composed of limestone and sandstone. FCR and cobbles were seen in the backfill of an animal burrow in the feature. No cultural material was seen in the first 15 cm of the tunnel of the burrow. The dimensions are 1.5 m N/S x 3.0 m E/W.

Feature-5 (F-5) is a BRM found in the southeast portion of the site. The ranch road went through the middle of it. It was composed of limestone and some sandstone FCR. Debitage was seen scattered across the feature. Visibility was best in the road. An edge-modified tool was recovered here. The dimensions are 25.0 m NE/SW x 8.0 m NW/SE. The rise was about 10-15 cm.

Feature-6 (F-6) is a hearth found in the southeast corner of the site. It was composed of a concentration of sandstone FCR of which some were conjoined. The dimensions were 3.0 m N/S x 4.0 E/W.

A quartzite hammer stone was recovered near the southeast boundary, east of F-5 and northeast of F-6. It did not appear to be associated with either feature.

At the north edge of the boundary east of the north/south fence three bison bones were found protruding from the cut bank on the south side of the drainage. These were identified by

Barbara A. Meissner (2002), faunal analyst at the Center for Archaeological Research at the University at San Antonio. A complete radius/ulna was found 130 m east of the fence that crosses the creek on the north side of this site at 30 cm below existing surface. The bison radius and ulna are fused together. It was removed intact. A scapula was found 125 m east of the radius/ulna at 70 cm below the existing surface. The scapula bone was thin and crumbled during removal. A distal humerus was found 15.0 m east of the scapula at 30 cm below existing surface. The proximal portion had deteriorated and had been gnawed by rodents. There were no butcher marks on the bones (Fig. 3).

41KM215

This site is found in the northeast corner of the survey area on a bluff overlooking the Llano River. There is a small, eroded drainage area on the northeast side. The site consists of two BRMs, one in the north end of the site and one in the east end. In the west corner are two bedrock mortars. The area beneath them has eroded and the rocks broke from the intact bedrock. Northeast of these mortars near the edge of the bluff was an area of sandstone mano and metate fragments scattered on the bedrock near the bluff. Northeast of this a short distance was a concentration of mussel shell fragments.

BRM-1 is in the north end of the site. It has some erosion from a small drainage that went



Figure 3: Bison bones recovered in a cut bank on the north edge of 41KM209. Radius/ulna (top), portion of scapula (left lower) and distal humerus (right lower).

Table 2: Diagnostic Dart Points and Tools by Sites

SITES	Almagre	Angostura	Buena Vista	Castroville	Early Tularosa	Edgewood	Enlow	Enlow-Filo	Godley	Langtry	Marcos	Marshall	Montell	Nolan	Pedernales	Travis	Untyped dart pts	Arrow pt preform	Biface	Thick biface	Biface tool	Scraper	Scraper/graver	Edge modified	Uniface	Guadalupe tool	Cave	Cave tool	Chopper	Hammerstone	Melale	Mono	Ochre	Mussel shell	Total Artifacts	
41KM146	1		2	1						2	1		1	7	6	1	6	1	16	2	1			2	1			1	1					5	58	
41KM147																								2							3 on 1 in 5	2			7	
41KM148			1																		1			2								1 1 5			6	
41KM149									No Artifacts																							0				
41KM150										1										1				1					1			1 5	1 5		2	8
41KM151																			4					6					1			1 5	1 5		12	
41KM152														1					4			3	2					1						3	14	
41KM153						1													1					2	1										5	
41KM154						1													1								1								4	
41KM155																			1					2						2 on					5	
41KM156																			1		1														2	
41KM157		1																	2					2											5	
41KM161																																1 1 1 1		1	2	
41KM162																						1		1						1 on 1 1	1 1 1 1	1 1 1 1	5	11		
41KM166																			1				1							2 on	1 on			1	6	
41KM203								1											1									1				2 on				5
41KM209																								1						1 on					2	
41KM215																1																			1	
41KM216				1					1			1								1												2 on			6	
41KM227																						1										1 on			2	
41KM228									No Artifacts																							0				
Total Dart Points & Tools from Survey	1	1	3	1	1	1	1	1	1	3	1	1	1	8	6	2	7	1	34	2	3	5	1	22	2	1	1	1	5	6	7	12	1	17	161	

Table 2: Types of diagnostic dart points and lithic tools by site. C-chert, Q-quartzite, S-sandstone and NC-not collected.

south/north and emptied into a larger drainage that went off the bluff and emptied into the Llano River. A few primary cortex flakes were seen. Secondary and tertiary flakes were seen along with several scrapers. A Travis dart point was found and collected near the center of the midden. Several sandstone fragments were seen. These may have been parts of manos or metates as some had a smooth surface. Mussel shell fragments were scattered on the midden. It was 11.0 m N/S x 13.0 m E/W. The rise was difficult to determine because the midden was on a slope and parts of it had washed into the drainage.

BRM-2 is found near the east end of the site about 30.0 m southeast of BRM-1 on the next terrace up. It is intact with some very slight erosional damage. A few primary cortex flakes along with secondary cortex and tertiary flakes of various sizes were seen. A 3.0 m N/S x 4.0 m E/W concentration of debitage was seen near the center of the midden. Mussel shell fragments were seen scattered around and on the BRM-2. The dimensions are 13.0 m N/S x 14.0 m E/W with a rise of about 70 cm.

The mortar holes are in the northwest corner of the site on large slabs of rock that had broken from the bedrock and had slid toward the river. The mortar hole in the northwest corner is designated MH-1. It is 13.0 cm x 15.0 cm x 8.0 cm deep. MH-2 is about 2.0 m north of MH-1. It is 11.0 cm in diameter and 3.5 cm deep. A concentration of sandstone metate and mano



Figure 4: Selected artifacts from the survey area. 1-Angostura 41KM1157, 2-Nolan 41KM146, 3-Bulverde 41KM146, 4-Langtry 41KM146, 5-Edgewood 41KM 154, 6-Biface preform 41KM166, 7-1890 "V" nickle 41KM216 and 8-Fresh water mussel shell 41KM152.

fragments were seen about 2.0 m northeast of MH-2. A concentration of mussel shell fragments was seen about 3.0 m northeast of the sandstone. On the bedrock between the mussel shell and BRM-2 scattered FCR, debitage, a few chert tools and mussel shell were seen.

41KM216

This is a large site in the southeast portion of the site. It slopes east to west toward the drainage. A ranch road goes through the north end. Most of the site was a quarry. Three lithic scatters were seen, two on the west edge and one in the southeast portion of the site. An area in the northeast portion had a hearth with an associated lithic scatter. Many FCR scatters with associated lithic scatter were seen in this area. The site was 420 m N/S x 590 m E/W.

Lithic Scatter-1 is 5.0 m N/S x 7.0 m E/W and 16.0 m east of the drainage. A core, quarry blank and several large flakes were noted here. A mano was collected about 4 m west of this feature. Lithic Scatter-2 is 18.0 N/S m x 15.0 m E/W. Debitage of various sizes and types, several thin and thick biface fragments were seen. A Marshall dart point fragment was collected here. Lithic Scatter-3 is 6.0 m N/S x 21.0 m E/W. Various sizes and types of debitage were seen. An area about 240 m SE/NW x 45-90 m SW/NE with many FCR/lithic scatters were seen. One hearth with lithic scatter was in the northeast portion of the site. It was 80 cm in diameter. The FCR lithic scatters boundaries are ephemeral. As a result no measurements were taken.

Seven artifacts were collected on this site. Artifacts-1 and-2 are quartzite manos. The first one was collected 4 m west of Lithic Scatter-1. The second one was collected near the road at the edge of the north central boundary. Artifact-3 is a Marshall dart point fragment found in the south end of Lithic Scatter-2. Artifact-4 is a Palmillas dart point fragment found in the eastern portion of the site. Artifact-5 is an 1890 "V" Liberty nickel found in the ranch road near the northeast corner. Artifact-6 is a thin biface fragment found in the north end of Lithic Scatter-1. Artifact-7 is an Early Triangular dart point found in the northeast portion of the site near the northwest boundary of the Lithic/FCR scatters area.

41KM227

This site is a lithic scatter in the southeast portion of the survey area about 150 m north of the northeast boundary of 41KM216. The upland terrain is sloping north toward a small, dry drainage. A few secondary cortex flakes and tertiary flakes, a mano fragment and a quarry blank were seen, but none collected. The site is 12.0 m N/S x 8.0 m E/W.

41KM228

This site is a lithic scatter in the northeast portion of the site about 75 m northeast of the northeast boundary of 41KM216. The site is on level upland terrain. A ranch road goes through the north end. Secondary cortex and tertiary flakes, tested cobble and core were seen, but none collected. The dimensions are 21 m N/S x 9 m E/W.

SUMMARY AND CONCLUSION

Twenty-one archeological sites were discovered and recorded on 340 acres. They are in

flood plains, valley walls, upland edges and on uplands. A total of 32 hearths, 21 burned rock middens, 5 sites with mortar holes and/or grinding facets, 4 lithic scatter/workshop areas, 2 quarry sites, 2 areas of deeply buried cultural deposits, 1 rock shelter and buried bison bones along a cut bank were found.

Diagnostic artifacts ranging from the later half of the Late Paleo-Indian to Late Prehistoric or about 8,800 to about 500 years old were found during the survey. The Late Paleo Angostura dart point base was recovered at 41KM157, a lithic scatter. A late prehistoric arrow point preform was recovered at 41KM146, BRM-5. A total of 157 artifacts were collected. These included chert, stone and mussel shell. A roll of barbed wire was noted, but not collected. Early, Middle, Late and Transitional Archaic artifacts were found throughout the survey area. An 1890 Liberty "V" nickel was recovered at 41KM216. No other historic material was found in this area so the coin was considered an isolated find. Mussel shells and fragments were seen on sites throughout the survey area. The concentration was higher in the area where the drainage entered the Llano River.

The southern half of the survey area has 133 bedrock mortar hole/grinding facets while the north has 13. Most of the exposed bedrock was found in the same area which could account for the number and location of the mortar holes/grinding facets. The material processed in the mortar holes and grinding facets may have grown in this area. Acorns may have been processed here as well (Saner and Hixson 1999:15-16).

In the northern portion of the survey area most of the terrain was in flood and fossil flood plains. There were two sites, 41KM151 and 41KM215, in the small amount of upland and valley walls found here. The majority of the sites were in flood and fossil flood plain. These sites are 41KM152, 41KM161, 41KM166, 41KM203 and 41KM209. Much of the soil had been deposited by flood episodes. Soil also washed down from the hills adjacent to some of the sites causing some features to be buried. Later flooding and erosional episodes exposed some of the sites that were seen during the survey.

The bison bones found in the cut bank on the north edge of 41KM209 had no indication of cultural alteration, such as butcher marks. This animal may have died of natural causes or was wounded by prehistoric hunters, ran away and was never found. The bones were probably deposited by flooding and covered by flood deposits. They were later exposed by erosion. These are isolated finds and appear to have no relation to 41KM209.

The survey area and surrounding region provided many resources over a long period of time for the early inhabitants as indicated by the density and variation of sites. The many mortar holes, grinding facets and fragments of manos and metates along with the burned rock middens show the area was used to process plant material into food. Over the years the environment and landscape has changed. As it changed, the type and quantity of plant material fluctuated. These sites may have been used intensely during favorable times. Use would decrease or was non-existent as dictated by the environment.

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APPENDIX A: ARTIFACT ANALYSIS BY SITES

INTRODUCTION

This appendix provides an analysis and identification of the artifacts collected during the 1998-2006 survey. They are divided by sites. Chert, sandstone, quartzite and other rock artifacts are discussed. Dimensions are given for each artifact. Mussel shells are listed, but no analysis, identification or description is given.

41KM146 ARTIFACT ANALYSIS

1. Unidentified dart point with patina on both sides. Stem and lateral edges were reworked after initial patina was formed. Slight amount of patina seen on reworked areas. One recent flake scar is seen. The dimensions were max. length 4.5 cm, max. width 3.1 cm, max. thickness 0.9 cm, stem length 1.3 cm and stem width 2.0 cm.
2. Biface mid-section with patina on both sides. The broken ends do not have patina. This indicates these breaks are recent. The dimensions were max. length 2.6 cm, max. width 2.3 cm and max. thickness 0.6 cm.
3. Biface fragment with patina on both sides. This may be the remnant of a dart point stem. However, the heat damaged areas prevent a reliable identification. The dimensions were max. length 2.3 cm max. width 2.2 cm and max. thickness 0.7 cm.
4. Bifacial cutting tool fragment with patina. This is the pointed half of a biface used for cutting soft material such as plants and meat. The high polish seen without magnification indicates this. Plants have a silica-like material in them that can accumulate on the blade of the tool used to cut or scrape them to create a similar polished look. It is possible this tool continued to be used after the break. The dimensions were max. length 6.4 cm, max. width 3.9 cm and max. thickness 0.7 cm.
5. Castroville perforator with patina on both sides. This artifact was probably a dart point converted to use as a perforating tool. It was broken during use or manufacture, then reworked into a perforator. It was used to make holes in leather. There is no alternate beveling, thick bit portion or use wear to indicate it was used as a drill. The time period is Late Archaic, 1,000 BC-200 AD (Turner and Hester, 1999). The dimensions were max. length 4.0 cm, max. width 3.7 cm, max. thickness 0.8 cm, stem length 1.1 cm, stem width 2.2 cm, bit length 1.4 cm and max bit thickness 0.6 cm.
6. Biface fragment with very light patina on both sides. The dimensions were max. length 4.6 cm, max. width 3.2 cm and max. thickness 0.7 cm.

7. Nolan dart point fragment. Alternate beveling was seen on the lateral edges of the stem. This is very characteristic of this type of point. The break is lipped and there is a burin break remnant on the lateral edge near the break. This indicates impact with a very hard object like a rock. Use wear on the lip portion of the break suggests possible use as a scraper or gouge after the break occurred. The time period is late Early Archaic, 4,000 BC-2,500 BC (Turner and Hester, 1999). The dimensions were max. length 3.6 cm, max. width 3.1 cm, max. thickness 0.8 cm, stem length 1.6 cm, max. stem width 2.2 cm, min. stem width 2.1 cm and stem thickness 0.7 cm.
8. Biface fragment with patina on both sides. The breaks are recent as there is no patina on them. The long break has some heat damage. The dimensions were max. length 3.2 cm, max. width 2.6 cm and max. thickness 0.6.
9. Biface fragment from the upper portion of a dart point. There is a shoulder on one side while the other shoulder has been broken. Dimensions were max. length 4.3 cm max. width 2.6 cm and max. thickness 0.6 cm.
10. Core tool with patina. There are highly polished areas on both sides of one portion of this artifact. This indicated it was used to cut or scrape soft material such as plants, leather or meat. The flake scar ridges are somewhat polished on the side without cortex (limestone) indicating this was probably a hand tool rather than a hafted. The dimensions were max. length 12.6 cm, max. width 10.7 cm and max. thickness 4.0 cm.
11. Chopper with patina on one surface and very light patina on the reverse. There is a small amount of cortex near the tip on the side with the most patina. A flake scar that ends at a fault in the flint was seen on the same side. There were small, crushing-type flakes seen on the left lateral edge on the side with the cortex. This indicates it may have been used as a crushing or chopping tool. The dimensions were max. length 10.4 cm, max. width 8.6 cm and max. thickness 3.1 cm.
12. Langtry dart point fragment. The broken edge appears to be a snap fracture caused when the point hit something hard or the shaft bent upon impact during use. There were small, non-cultural flakes on the break. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester, 1999). The dimensions were max. length 4.7 cm, max. width 3.2 cm, max. thickness 0.7 cm, stem length 2.0 cm, stem width 1.4 cm and stem thickness 0.6 cm.
13. Pedernales dart point with one shoulder missing. Patina was seen on both surfaces and on the break. The corner on one side of the base of the stem was missing. Brown chert can be seen in the break indicating this was a recent break. There was a small portion of the brown chert exposed in a flake scar. This flake may have been removed after the patina formed, but in prehistoric times. It was difficult to determine if it was broken during manufacture or while in use. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester, 1999). The dimensions were max. length 2.6 cm, max. width 2.8 cm, max. thickness 0.8 cm, stem length 1.8 cm, stem width 1.8 cm and stem thickness 0.7 cm.

14. Biface fragment with patina on both sides. There were no signs of use. The break occurred during manufacture. The dimensions were max. length 4.7, max. width 2.0 cm and max. thickness 0.7 cm.
15. Biface fragment proximal end. This artifact was manufactured from a large flake. Remnants of the original flake surface were seen on both sides. The break has a slight twist and a rough area at one end. These indicate the break occurred during manufacture. A pinkish tinge was seen in the chert and had a waxy feel to the surface. These indicate the chert was heat-treated prior to flaking. The dimensions were max. length 3.8 cm, max. width 2.7 cm and max. thickness 0.9 cm.
16. Pedernales dart point fragment with some patina on both surfaces. The break was straight with the remnant of a negative lip on one part of the break. A burin flake scar was seen along one lateral edge of the blade extending to the shoulder. One side of the base of the stem is missing. This point was broken during use. There was a small flake on the burin scar at the break. This is recent. The time period is Middle Archaic, 2,500 BC- 1,000 BC (Turner and Hester, 1999). The dimensions were max. length 5.0 cm, max. width 3.9 cm, max. thickness 0.7 cm, stem length 1.7 cm, stem width 2.2 cm, stem thickness 0.8 cm, depth of stem base 0.4 cm and shoulder width 0.9 cm. One shoulder was not measured due to the break.
17. Edge-modified uniface. It was made from a large flake. There was use wear on three sides. The dimensions were max. length 6.3 cm, max. width 4.6 cm and max thickness 1.5 cm.
18. Unidentified dart point fragment with patina on both surfaces. It had a parallel stem with a slightly concave base. There was recent heat damage on the tip. Recent breaks were seen on the stem and on one shoulder. The cedar in the area had been bulldozed which could account for the damage. The dimensions were max. length 5.6 cm, max. width 3.1 cm, max. thickness 0.8 cm, stem length 1.0 cm, stem width 2.2 cm and stem thickness 0.7 cm.
19. Montell dart point stem fragment with slight amounts of patina on one surface. The breaks did not have patina and therefore may be recent. The time period is Late Archaic, 1,000 BC-200 AD (Turner and Hester, 1999). The dimensions were max. length 2.2 cm, max. width 1.7 cm, max. thickness 0.4 cm, stem length 0.8 cm, stem width 1.0 cm, and stem thickness 0.3 cm.
20. Thick biface fragment. It was white, reddish-pink and yellowish-brown in color. The surface has a waxy feel. This along with the unusual colors strongly indicate it was heat-treated. The break did not happen during manufacture. The dimensions were max. length 9.2 cm, max. width 5.2 cm and max. thickness 1.5 cm.
21. Biface with cortex on one end. It is difficult to determine if this was an abandoned biface

- or was used as a tool. The dimensions were max. length 4.4 cm, max. width 3.6 cm and max. thickness 1.6 cm.
22. Pedernales dart point. All the breaks seen are burin flake scars. These were caused by hitting something hard, like a rock, at high speed. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester). The dimensions were max. length 3.2, max. width 1.9 cm, max. thickness 0.7 cm, stem length 1.3, stem width 1.9 cm, stem thickness 0.7 cm and basal concavity 0.4 cm.
 23. Uniface with cortex and patina on both surfaces. This artifact did not have any use wear present on the edges indicating this flake was removed during manufacture. The dimensions were max. length 4.5 cm, max. width 3.6 cm and max. thickness 1.9 cm.
 24. Biface tip with patina on both surfaces. The uneven break indicates it was broken during manufacture. The dimensions were max. length 3.2 cm, max. width 2.5 cm and max. thickness 0.5 cm.
 25. Bulverde dart point with patina on both surfaces, one more than the other. The shoulder on one side is missing and there is a flake scar on one surface without patina. These are recent breaks. The time period is late Early Archaic, 3,000 BC-2,500 BC (Turner and Hester, 1999). The dimensions were max. length 5.2 cm, max. width 3.1 cm, max. thickness 0.8 cm, stem length 1.7 cm, stem width 1.6 cm, stem thickness 0.7 cm and shoulder width 0.9 cm.
 26. Fresh water mussel shells. (n=5).
 27. Travis dart point with patina on both surfaces. A small portion of the tip was missing. It may have been missing due to impact. This artifact was not found on 41KM146, but was about 200 m west of the site. This was an isolated find, but will be included in these artifacts for convenience. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester, 1999). The dimensions were max. length 4.6 cm, max. width 2.1 cm, max. thickness 0.8 cm, stem length, 1.3 cm, stem width 1.7-1.8 cm and stem thickness 0.7 cm.
 28. Biface fragment. There was no use wear seen on either end. However, the ends were steep and may have been a precursor to a gouge. The dimensions were max. length 5.2 cm, max. width 3.1 cm, and max. thickness 1.7 cm.
 29. Pedernales dart point with some patina on both surfaces. There were recent breaks on the tip, one lateral edge, one shoulder and one prong of the stem. The characteristic thinning flake was seen on one side of the stem. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester, 1999). The dimensions were max. length 4.6 cm, max. width 2.7 cm, max. thickness 0.8 cm, stem length 1.7 cm, stem width 2.0 cm, stem thickness 0.7 cm and stem base concavity 0.3 cm.

30. Nolan dart point. It had the characteristic alternately beveled lateral stem edges. The tip has been reworked. There was a slight concavity in the stem base. The time period is late Early Archaic, 4,000 BC to 2,500 BC (Turner and Hester, 1999). The dimensions were max. length 4.4 cm, max. width 3.1 cm, max. thickness 0.7 cm, stem length 1.6 cm, stem width 1.7-1.8 cm, stem thickness 0.6 cm and stem basal concavity 0.2 cm.
31. Almagre dart point with patina on both surfaces. There was a recent flake removed from one lateral edge. There were two areas on the artifact that were difficult to remove flakes. This could be the reason the point may not have been finished. It is thought that the Almagre point is a Langtry preform. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester, 1999). The dimensions were max. length 7.3 cm, max. width 4.3 cm, max. thickness 1.1 cm, stem length 1.4 cm, stem width 1.5-2.4 cm and stem thickness 0.9 cm.
32. Unidentified dart point. The break was uneven or perverse indicating it was broken during manufacture. There was a black substance on one surface and two pot lid flake scars on the base of the stem. This indicated it was exposed to heat. The damage to the stem prevent making a positive identification. The dimensions were max. length 4.5 cm, max. width 4.3 cm, max. thickness 1.0 cm, stem length 2.0 cm, stem width 2.1-2.3 cm and stem thickness 0.7 cm.
33. Edge-modified secondary cortex flake. Cortex was seen on a portion of one surface. The modified edge had a dull polish on very small flake scars on both edges. This was used as a cutting tool on soft material. The dimensions were max. length 4.3 cm, max. width 2.7 cm and max. thickness at the bulb of percussion 0.9 cm.
34. Biface fragment with patina on one surface and on the break. The uneven break indicates it was broken during manufacture. The lack of patina on the flake scar on one lateral edge denotes a recent break. The dimensions were max. length 5.5 cm, max. width 3.2-3.4 cm, and max. thickness 0.9 cm.
35. Biface fragment. The breaks on either end were uneven indicating a manufacturing mistake. One small, light-colored flake was seen on the break. This was recent. The dimensions max. length 3.3 cm, max. width 3.3 cm and max. thickness 0.7 cm.
36. Bulverde dart point stem with a slight amount of patina on the base of the stem. The break may have been caused by pressure on the hafted portion of the point on impact resulting in a snap fracture. The time period is Early Archaic, 3,000 BC-2,500 BC (Turner and Hester, 1999). The dimensions were max. length 2.6, max. width 3.1 cm, stem length 1.9 cm, stem width 1.7-2.2 cm and stem thickness 0.7 cm.
37. Unidentified dart point fragment. The break was smooth with a lip. The remnants of an impact flake scar were seen on one surface at the break. A portion of the stem was

broken in recent times preventing identification. The dimensions were max. length 4.5 cm, max. width 3.5 cm, max. thickness 0.8 cm, stem length 1.5 cm, stem thickness 0.6 cm. Due to the break in the stem, no width was taken.

38. Edge-modified secondary cortex flake. The side with the cortex on it has flaking along one edge. The edge was dull and the flaked area had some polish. No flakes were seen on the reverse side. The dimensions were max. length 7.1 cm, max. width 3.6 and max. thickness at bulb of percussion 1.2 cm.
39. Nolan dart point. The lateral edges of the stem had alternate beveling. A small portion of the tip was missing. There was a lip on the break and the remnants of an impact flake scar. This indicates it was broken during use. The time period is late Early Archaic, 4,000 BC-2,500 BC (Turner and Hester, 1999). The dimensions were max. length 5.4 cm, max. width 4.0 cm, max. thickness 0.9 cm, stem length 1.4, stem width 2.4-2.5 cm and stem thickness 0.7 cm.
40. Nolan dart point fragment with light patina on one side. The lateral edges of the stem were alternately beveled. The distal portion of the point was missing. The break was smooth, straight and had a lip. This indicated it was broken during use. The time period is late Early Archaic, 4,000 BC-2,500 BC (Turner and Hester, 1999). The dimensions were max. length 4.2 cm, max. width 2.5 cm, max. thickness 0.9 cm, stem length 1.5, stem width 1.5-1.7 cm and stem thickness 0.6 cm.
41. Nolan dart point. The stem was alternately beveled on the lateral edges. There was a knot of chert that could not be removed near the tip. However, the point was finished and used or ready for use. The time period is late Early Archaic, 4,000 BC-2,500 BC (Turner and Hester, 1999). The dimensions were max. length 5.8 cm, max. width 2.3 cm, max. thickness 0.8 cm, stem length 1.8 cm, stem width 1.5-1.9 cm and stem thickness 0.6 cm.
42. Nolan dart point. The stem had alternately beveled lateral edges. The break was smooth, but with a slight twist. The cause of the break was unknown. The time period is late Early Archaic, 4,000 BC-2,500 BC (Turner and Hester, 1999). The dimensions were max. length 3.0 cm, max. width 3.0 cm, max. thickness 0.7 cm, stem length 1.8 cm, stem width 1.4-1.6 cm and stem thickness 0.6 cm.
43. Biface fragment. The small break was smooth, and there was a lip present. This was done during use. The flint color in the large curved break was slightly different in color, indicating this may be recent. The dimensions were max. length 3.3 cm, max. width 12 cm, 2.3 cm and max. thickness 0.6 cm.
44. Biface fragment. The break has the remnants of a lip and is slightly curved. There is a small burin flake scar on one lateral edge of the break. This artifact may have been used as a gouge and snapped. It was unidentified. The dimensions were max. length 27 cm, max. width 2.8 cm and max. thickness 0.7 cm.

45. Arrow point preform broken during manufacture. The dimensions were max. length 2.6 cm, max. width 1.9 cm and max thickness 0.4 cm.
46. Biface fragment. The break was slightly perverse indicating the break probably happened during manufacture. There was a waxy feel to the surface. This indicated the chert was heat-treated. Remnant of the original flake the biface was being made out of can be seen. The dimensions were max. length 3.0 cm, max. width 3.4 cm and max. thickness 1.0 cm.
47. Marcos dart point with light patina. The breaks on the blade and on the stem were recent. This was indicated by the lack of patina in the breaks. The time period is Late to Transitional Archaic, 1,000 BC-600 AD (Turner and Hester, 1999). The dimensions were max. length 3.7 cm, max. width 4.0 cm, max. thickness 0.7 cm, stem length 1.2 cm, stem width 2.2-2.7 cm and stem thickness 0.6 cm.
48. Pedernales dart point stem with patina. There were remnants of an impact flake scar on the side of the break. This indicated that the point may have been reworked one or more times. The shorter the length of the blade the more likely an impact flake scar would appear on the stem. There were the remnants of a lip indicating a snap fracture from use. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester, 1999). The dimensions were stem length 2.2 cm, stem width 1.8 cm, stem thickness 0.7 cm and depth of basal concavity 0.6 cm.
49. Nolan dart point with light patina. There was alternate beveling on both lateral edges of the stem. Some grinding was noted here. The base of the stem at the corner had use wear. There was a burin break with another flake over a part of it. It appears this point was reworked and used as a drill. The time period is late Early Archaic, 4,000 BC-2,500 BC (Turner and Hester, 1999). The dimensions were max. length 4.7 cm, max. width 3.2 cm, max. thickness 0.7 cm, stem length 1.9 cm, stem width 1.5-1.8 cm, and stem lateral edge depth 0.2 cm.
50. Biface fragment with light patina and heat damage on the edges. On one end were the remnants of a break that occurred long before the present surface was chipped. This was indicated by the heavy patina on the break. The dimensions were max. length 3.5 cm, max. width 2.8 cm and max. thickness 1.0 cm.
51. Biface. The chert was pinkish in color and had a waxy feel on the surface. This indicates it was heat-treated. The tip appears to have been broken during manufacture. There were two areas where the knapper was having difficulty removing flakes, one on the base and the other near the tip. This may account for the break at the tip. The dimensions were max. length 3.6 cm, max. width 3.0 cm and max. thickness 0.7 cm.
52. Langtry dart point with some patina on one surface. There were recent breaks on the tip, lateral edge of the blade and both shoulders. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester, 1999). The dimensions were max. length 4.8 cm, max.

width 3.5 cm, max. thickness 0.6 cm, stem length 1.3, stem width at the blade 1.3 cm, stem width at the base 1.2 cm and the stem thickness 0.4 cm.

53. Unidentified dart point with remnants of an impact flake scar. A portion of the base of the stem and both shoulders were missing. This point probably never had prominent shoulders. It appeared that effort was made to rework the point. The break at the tip is a recent one, indicated by the lighter color of the chert in the break. The dimensions were max. length 5.3 cm, max. width 3.2 cm, max. thickness 0.9 cm, stem length 1.9 cm, stem width 1.8 cm and stem thickness 0.7 cm
54. Unidentified dart point that had a waxy feel on the surface indicating it was heat-treated. The break was smooth, but happened during manufacture. The dimensions were max. length 5.7 cm, max. width 3.2 cm, max. thickness 1.1 cm, stem length 1.5 cm, stem width at the blade 1.7 cm, stem length at base 1.4 cm and stem thickness 0.9 cm.
55. Pedernales dart point fragment with light patina seen on both surfaces. There is a waxy feel on the surfaces indicating that it was heat-treated. The remnants of an impact flake scar were seen. It may have been reworked after it broke. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester, 1999). The dimensions were max. length 3.6 cm, max. width 2.9 cm, max. thickness 0.8 cm, stem length 1.9 cm, stem width 2.3 cm and stem thickness 0.7 cm.

41KM147 ARTIFACT ANALYSIS

1. Edge-modified tertiary flake. Use wear was seen on lateral edge of the blade. It was possible this artifact was partially submerged in water for some time as indicated by the light-colored material that adhered to the ventral (bottom) side. The dimensions were length 6.0 cm, width 3.9 cm and thickness 2.0 cm.
2. Edge-modified on a secondary cortex flake. There was flaking on the surface near one edge and dulling of that edge. This indicated the tool was used as a scraper. There was heat damage to both surfaces of the tool. The dimensions were 5.1 cm x 5.2 cm x thickness 1.5 cm.
3. Sandstone metate fragment. On one side a smooth slightly concave surface was seen while the other side was rough. The dimensions were 7.8 cm x 5.6 cm and thickness 2.5-3.2 cm.
4. Sandstone metate fragment. One side was lighter in color than the other. The lighter side had peck marks. This was the grinding surface. The darker side was smooth, but the surface was not even. This fragment was burned. The dimensions were 8.4 cm x 8.0 cm x thickness 3.6-3.8 cm.

5. Sandstone metate fragment. One surface was smooth and slightly concave while the other side was rough and uneven. The dimensions were 7.6 x 5.4 cm x thickness 2.9-3.1 cm.
6. Sandstone mano fragment. One surface was smooth and slightly rounded with peck marks. The other side was rough and rounded. The dimensions were 6.8 cm x 4.0 cm x thickness 2.0-3.0 cm.
7. Sandstone triangular-shaped mano. One side was smooth with a convex surface. The other side was sloping and rough. A profile of the artifacts showed a thickness at one end and thin at the other. The dimensions were 9.8 cm x 8.3 cm x thickness 2.4-5.0 cm.

41KM148 ARTIFACT ANALYSIS

1. Quartzite mano. Pecking was seen around the edges. This may have been done to shape the mano. One surface was very smooth and slightly convex. The other surface was smooth, flat with some battering in the center. The battering may have been from pounding material into small enough pieces that made grinding easier. On the flat end was an area of light quartzite. This may have been formed in the same way as the center battering. Several rust-colored streaks were seen on one surface. These were recent and probably made by metal scraping over the stone. This area was bulldozed. The dimensions were 9.0 cm x 7.5 cm x thickness 4.4-5.3 cm.
2. Biface mid-section fragment. It was broken during manufacture as indicated by the uneven breaks. There were flakes on the broken edges. These do not appear to be from use. The dimensions were length 3.7 cm, width 3.5 cm, thickness 0.8 cm.
3. Edge-modified flake. One steep lateral edge was seen. It may have been used as a scraper for a very short term duration. The dimensions were 5.2 cm x 3.7 cm x thickness 1.5 cm.
4. Bulverde dart point stem with patina on one surface and very light patina on the other. There was no patina on the breaks. This indicated a possibly recent break. The time period is late Early Archaic, 3,000 BC-2,500 BC (Turner and Hester 1999). The dimensions were length 2.2 cm, width, 1.7-2.0 cm and thickness 0.5 cm.
5. Edge-modified chert with cortex. There was some edge modification. The cause was undetermined. The dimensions were length 10.8 cm, width 5.2 cm and thickness 2.5 cm.
6. Sandstone metate fragment. One surface had a very smooth, almost flat, surface. The other was rough and uneven. The dimensions were 9.1 cm x 7.4 cm x thickness 2.0-2.4 cm.
7. Sandstone mano fragment. This fragment was broken into two pieces. One surface was smooth and slightly convex. The other side was rough and uneven. The dimensions were

7.5 cm x 5.9 cm x thickness 1.9-2.3 cm. The measurements were taken with pieces in place as if it were one fragment.

41KM150 ARTIFACT ANALYSIS

1. Edge-modified flake. There was some polish on the lateral edges. This artifact may have been a short-term-use scraper. The dimensions were length 5.1 cm, width 4.0 cm, thickness 1.0 cm.
2. Chopper/core. The edge was heavily battered, indicating use as a chopper or crushing tool. The dimensions were 8.0 cm x 6.9 cm x 5.0 cm.
3. Sandstone metate fragment. A portion of one surface had smooth area. The wide area of this side was pitted and somewhat rough. When the metate was complete, this was the edge of the grinding surface. The other side was uneven. The thickness appeared to be consistent throughout the fragment. The dimensions were 10.0 cm x 7.4 cm x thickness 2.3-2.4 cm.
4. Fresh water mussel shell fragment (n=2).
5. Langtry dart point fragment. It appeared that there was a lip on the break, but it was partially removed when later damage occurred to the artifact. One of the shoulders was reworked. It appeared that the point may have been broken during use and some further damage was sustained after the break. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester 1999). The dimensions were length 3.6 cm, width 3.7 cm, thickness 0.6 cm, stem length 1.8 cm, stem width 1.0-1.6 cm and stem thickness 0.5 cm.
6. Biface fragment. There were remnants of a lip on the break. This indicated it was broken during use. There was a slight pink tinge to part of the surfaces and some of the surface had a waxy feel. It was heat-treated. The dimensions were length 4.6 cm, width 2.2 cm and thickness 1.1 cm.
7. Sandstone mano. Both surfaces were very smooth and slightly convex. The flat end appears to have been broken, smoothed and put back into use. The rounded portion was rough. A few pebbles up to 1.5 cm in diameter were seen in the rock. The dimensions were 8.9 cm x 6.7 cm x thickness 2.7-3.5 cm.

41KM151 ARTIFACTS ANALYSIS

1. Sandstone rock found in mortar hole-6. There was no wear or other indications that it was used. The dimensions were length 10.5 cm, width 2.2 cm and thickness 1.5 cm.

2. Core. Flaking on a portion of the surface of one lateral edge was heavy and steep. This did not appear to be use. It was done to prepare a striking platform to remove flakes. The dimensions were 8.8 cm x 7.3 cm x thickness 4.9 cm.
3. Biface fragment. This artifact was broken during manufacture as indicated by the uneven and slightly curved break. It was also heat-treated. The surface was waxy, and the chert had a pinkish tinge. The dimensions were length 3.8 cm, width 3.7 cm and thickness 0.9 cm.
4. Sandstone mano. One surface was definitely used as a grinding surface. This surface was even with a slight depression in the center probably used to break hard nuts and other material to be ground. The other surface was slightly uneven. If it was used for grinding, the smooth surface may have deteriorated due to exposure. The dimensions were 10.6 cm x 8.7 cm x thickness 4.3 cm.
5. Unidentified dart point fragment. There was the remnant of an impact flake scar on the tip. An attempt was made to rework this point. The point was broken during use. The dimensions were length 4.2 cm, width 3.1 cm and thickness 0.9 cm.
6. Edge-modified secondary cortex flake. One surface has been worked on the lateral edges. The other surface had several flakes removed. The exact use of this artifact was unknown. The dimensions were length 4.7 cm, width 3.6 cm and thickness 1.4 cm.
7. Biface fragment with patina. The break surfaces were rough and uneven. The breaks were most likely from manufacture failure. The dimensions were 3.8 cm x 2.8 cm x thickness 0.6.
8. Biface tip fragment. The cause for the breaks was unknown. The dimensions were length 2.2 cm, width 2.0 cm and thickness 0.7 cm.
9. Biface tip fragment. It appeared this artifact was broken during manufacture. The break was rough and uneven. The dimensions were length 3.3 cm, width 1.8 cm and thickness 0.8 cm.
10. Edge-modified flake. One surface of the flake was smooth, except for several small flakes on one edge. The other had flaking on several lateral edges. The use of this artifact was unknown. The dimensions were length 6.0 cm, width 4.0 cm and thickness 1.6 cm.
11. Edge-modified secondary cortex flake. One lateral edge of the surface with flaking had indications that it was used as a cutting and scraping tool. A portion had flakes on both sides indicating cutting. Flakes could be seen only on one side at another segment indicating scraping. The dimensions were 4.2 cm x 4.3 cm x thickness 1.2 cm.
12. Edge-modified flake. One surface had been flaked while the other was relatively smooth.

The short lateral edge of the flaked side had use-wear similar to that found on cutting tools. There were some flakes on the reverse side of the use-wear area. The dimensions were length 5.4 cm, width 3.7 cm and thickness 1.1 cm.

13. Edge-modified secondary cortex flake scraper. This was a flake that had one end used as a scraper. The flake was removed from a larger piece of flint much earlier, as indicated by the different color of the flint. The early flint was yellow-brown while the newer flakes were grayish-brown. Cortex was seen on both ends. The dimensions were length 8.1 cm, width 5.0 cm and thickness 1.3 cm.
14. Edge-modified secondary cortex flake. On the thin lateral edge were use-wear patterns and some polish that indicated use as a cutting tool. The dimensions were length 5.7 cm, width 2.8 cm and thickness 1.3 cm.
15. Two specimens of chert from the quarry on this site. Both specimens were low quality chert making it difficult to work. However, a few tools were found on other sites in the survey.

41KM152 ARTIFACT ANALYSIS

1. Edge-modified scraper/cutting tool. The tool was made from a long, curved, thick flake of flint. One surface was smooth with several small flakes. The other side had flaking at a steep angle on one lateral edge. This side was used for scraping. The other edge had use-wear present, but no steep angle. It was used for cutting and scraping. The dimensions were length 11.2 cm, width 4.5 cm and thickness 1.8 cm.
2. Edge-modified scraper. The scraper was made on a flake. One side is smooth with several small flakes. The other side was flaked with steep edges on all sides. The dimensions were length 6.3 cm, width 5.4 cm and thickness 1.2 cm.
3. Edge-modified scraper. The tool was made from a piece of low quality flint. There were steep edges on two sides and one corner. Use-wear was seen here and on most of the other lateral edges. Two curved indented areas were seen on one lateral edge. This indicated possible use as a spoke shave. The dimensions were length 10.2 cm, width 9.0 cm and thickness 1.8 cm.
4. Core tool. This was a river rolled flint cobble probably collected in the Llano River next to the site. The yellow-brown portion was the surface of the original cobble. The gray-brown portion was chipped to make the core. The black material seen on one surface was probably algae or fungus that grew on the exposed side. It had some medium to large flakes removed. Use-wear was seen on the edges of the gray-brown portion indicating scraping or cutting. The dimensions were 11.0 x 11.4 x thickness 4.3 cm.

5. Biface fragment. This biface was broken during manufacture as indicated by the uneven break and the limestone on break. The dimensions were 4.3 cm x 5.5 cm x thickness 1.2 cm.
6. Roll of barbed wire on the ground. Not collected.
7. Edge-modified scraper. This tool was made from a flake. Steep edges were seen on almost all the lateral edges. Very slight polish and wear were seen on these edges. This indicated that the scraper may not have been used much or it was resharpened. The dimensions were length 6.8 cm, width 4.3 cm and thickness 1.4 cm.
8. Fresh water mussel shell (n=1).
9. Edge-modified scraper. The flint had a waxy feel indicating it was probably heat-treated. Steep flakes were seen on several portions of the edge on one side. The other side was relatively smooth. The dimensions were 6.2 cm x 9.0 cm x thickness 1.7 cm.
10. Nolan dart point. The break was uneven indicating it was broken during manufacture. The stem on the lateral edges was concave while the stem base was slightly convex. The time period is late Early Archaic, 4,000 BC-2,500 BC (Turner and Hester 1999). The dimensions were length 6.6 cm, width 2.7 cm, thickness 0.7 cm, stem length 1.6 cm, stem width 1.3-1.4 cm and stem thickness 0.5 cm.
11. Biface fragment. This fragment was probably broken during manufacture as indicated by the inclusion on one end of the break. The dimensions were length 4.5 cm, width 1.9 cm and thickness 0.7 cm.
12. Pedernales dart point with slight patina. On the broken end of the stem was a thinning in the center and a channel flake on side. This was indicative of the concave base of a Pedernales dart point stem. Pinkish stains were seen on the surface of the stem and near the long break, indicating possible heat-treating of the flint prior to manufacture of the dart point. The breaks on the stem and long break had no patina indicating a possible recent break. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester 1999) The dimensions were length 2.7 cm, width 3.7 cm, thickness 0.7 cm, stem length remnant 1.8 cm, stem width 2.3 cm and stem thickness 0.7 cm.
13. Round biface with patina on one side. The edge may have use-wear or it may have been edge ground to prepare striking platforms. The dimensions were 6.0 cm x 6.1 cm x thickness 1.9 cm.
14. Fresh water mussel shell (n=1).
15. Biface fragment with patina on a portion of one side. A portion of the side with patina has been reworked since the patina formed. The break was a manufacture failure as indicated

by the slight twist in the break and the jagged area near one end. The dimensions were 4.2 cm x 6.2 cm x thickness 1.1 cm.

16. Fresh water mussel shell (n=1).

41KM153 ARTIFACT ANALYSIS

1. Possible Guadalupe tool. The Guadalupe tool was used as a gouge. The artifact found was smaller than most Guadalupe tools, but may have been used as described. The time period is Early Archaic, 3,500 BC or earlier (Turner and Hester 1999). The dimensions were maximum length 6.9 cm, maximum width 2.5 cm and maximum thickness 1.8 cm.
2. Edge-modified scraper. The cortex on one side appeared to be smoothed by river rolling. There was small flaking on a portion of the lateral edges on one side. The other side was smooth. Polish was seen along the edges and on the flake scars indicating this was used as a scraping tool. The dimensions were maximum length 8.7 cm, maximum width 6.4 cm and maximum thickness 1.7 cm.
3. Enson dart point. The point was small which was a characteristic of Transitional Archaic dart points. There appeared to be an impact fracture on the tip. The time period is Transitional Archaic, 200 BC-600 AD (Turner and Hester 1999). The dimensions were length 2.7 cm, width 1.6 cm, thickness 0.5 cm, stem length 0.8 cm, stem width 1.2-1.4 cm and stem thickness 0.4 cm.
4. Edge-modified flake. Under 10x magnification slight wear was seen on lateral edge. This may have been from short term cutting and/or scraping or from an animal stepping on the artifact. The dimensions were length 7.4 cm, width 2.3 cm and thickness 1.4 cm.
5. Biface. This biface was made from a flake. Remnants of the flake were seen on the flat surface. The dimensions were length 4.7 cm, width 3.1 cm and thickness 0.9 cm.

41KM154 ARTIFACT ANALYSIS

1. Edgewood dart point with patina. This artifact had the tip missing. The break had no patina and fire damage was present. This showed the tip was broken or removed by heat damage in recent times. One barb was missing. The break had patina on it indicating it was removed about the time the point was made. The time period is Transitional Archaic, 200 BC-600 AD (Turner and Hester 1999). The dimensions were length 3.6 cm, width 2.2 cm, thickness 0.6 cm, stem length 0.9 cm, stem width 1.2-1.7 cm, stem thickness 0.5 and stem base depth 0.1 cm.

2. Unidentified biface with patina on both sides and cortex on one side. On the side with cortex, one edge had little or no patina indicating the biface was reworked after the patina formed. The tip was broken; however, the cause was undetermined. There was a concave base. The dimensions were length 4.9 cm, width 2.2 cm, thickness 1.0 cm and base depth 0.3 cm.
3. Unidentified dart point with slight patina on both sides. The blade was unsymmetrical and on one edge it appeared that an attempt to rework the point was made. The dimensions were length 3.8 cm, width 2.7 cm, thickness 0.7 cm, stem length 1.4 cm, stem width 1.9-2.0 cm and stem thickness 0.7 cm.
4. Core with heat damage and cortex. The dimensions were 3.6 cm x 3.7 cm x 5.5 cm.

41KM155 ARTIFACT ANALYSIS

1. Edge-modified flake with patina on both sides. The edge modification was done after the patina formed. This was perhaps an attempt to rework the flake. The dimensions were 6.0 cm x 4.0 cm x thickness 1.3 cm.
2. Chert cobble with fire damage on one end and one flake removed. The flake scar had patina on it. It was possible the cobble was used as a hammer stone. The dimensions were 7.3 cm x 5.9 cm x 4.7 cm.
3. Edge-modified spoke shave with patina on both sides. The steep edge had an indentation indicating it may have been used as a spoke shave. The dimensions were 5.0 cm x 4.4 cm x thickness 1.0 cm, spoke shave width 0.8 cm and spoke shave depth 0.4 cm.
4. Quartzite hammer stone. Quartzite was a very hard rock and often used as a hammer stone. There was very slight battering on one portion of the stone. The dimensions were 4.0 cm x 4.8 cm x 6.7 cm.
5. Biface with cortex on both sides. It appeared that this biface was heat treated. There was a waxy feel on the surface, pinkish tinge on portions of the surface and the cortex on the end was red. The chert was not good quality and difficult to work. It was probably abandoned at the quarry site. The dimensions were length 5.1 cm, width 3.3 cm and thickness 1.1 cm.

41KM156 ARTIFACT ANALYSIS

1. Biface fragment/scrapper. This was a biface that broke, possibly during manufacture, and was then converted to a scrapper. A steep edge with flaking was seen on one side. Under 10x magnification polish was seen on the flaked edge. The other side was smooth along

this edge. The surface was waxy indicating artifact was heat-treated. The dimensions were 3.9 cm x 5.9 cm x thickness 1.4 cm.

2. Biface fragment. Appears to be heat-treated flint from quarry on 41KM151. The dimensions were length 4.5 cm, width 3.3 cm and thickness 1.3 cm.

41KM157 ARTIFACT ANALYSIS

1. Biface. This biface had an unusual shape. It may be an attempt to rework a broken biface. The surface was waxy indicating heat-treating. The dimensions were 3.0 cm x 3.5 cm x thickness 0.7 cm.
2. Angostura base fragment. This artifact had ground edges and the base was steep. It was expanding from the base towards the breaks. The break that was parallel to the lateral edges appears to have been a burin flake scar. This indicated it was broken during use. The time period is late Late Paleo-Indian to Early Archaic, 6,800 BC-5,000 BC (Turner and Hester 1999). The dimensions were length 2.0 cm, width 1.8 cm, thickness 0.7 cm and base width 1.5 cm.
3. Edge-modified flake with cortex on one side. This flake was worked on one edge. The dimensions were length 5.0 cm, width 3.3 cm and thickness 1.4 cm.
4. Biface fragment. This was probably broken during manufacture and abandoned. There were many small flakes on the top and bottom of the break most likely caused by animals stepping on the artifact. The dimensions were length 4.2 cm, width 3.8 cm and thickness 1.5 cm.
5. Edge-modified. There was flaking on the side of one lateral edge with some polishing indicating use as a cutting tool. The dimensions were length 5.3 cm, width 2.1 cm and thickness 0.8 cm.

41KM161 ARTIFACT ANALYSIS

1. Sandstone metate. This was a large stone with a grinding bowl in one surface. The dimensions were 37.0 cm x 46.0 cm x thickness 11.0 cm, bowl 15.2 cm diameter and depth 2.5 cm.
2. Fresh water mussel shell (n=1).

41KM162 ARTIFACT ANALYSIS

1. Pounding/crushing tool. This tool had heavy battering on most of the lateral edges. The dimensions were 4.2 cm x 4.4 cm x thickness 2.3 cm.
2. Sandstone mano fragment-not collected.
3. Edge-modified flake scraper. Steep lateral edges were seen on the curved portion of one side of this artifact. The other surface was smooth. The dimensions were 4.1 cm x 4.8 cm x thickness 0.7 cm.
4. Ochre. Ochre was seen on this piece of sandstone. Areas of this stone had a dark red, powdery material that was often used to make paint. The dimensions were 4.2 cm x 4.7 cm x thickness 1.5 cm.
5. Sandstone metate-not collected. The entire surface of the metate was used for grinding. There were peck marks on the grinding surface.
6. Secondary cortex flake. Flint was very similar to flint seen at the quarry site on 41KM 151. The dimensions were 5.7 cm x 7.7 cm x thickness 2.0 cm.
7. Fresh water mussel shell fragments (n=3).
8. Fresh water mussel shell fragments (n=2).

41KM166 ARTIFACT ANALYSIS

1. Edge-modified graver/scraper. A small portion of one lateral edge on one side had steep flaking and a point. There was dull and some polish on the steep flaking and use-wear on the point. The dimensions were 4.1 cm x 5.1 cm x thickness 1.1 cm, point length 0.2 cm, width at base 0.5 cm and point thickness 0.2 cm.
2. Biface fragment-preform. The break occurred during manufacture. This was indicated by the slight twist in the break and the inclusion in it. One lateral edge was dull. This was caused by use of the broken preform as a cutting tool. The dimensions were length 4.8 cm, width 4.0 cm, thickness 0.9 cm and depth of base 0.3 cm.
3. Fresh water mussel shell (n=1).
4. Unidentified dart point fragment. The artifact was heat-treated or heat damaged as indicated by the pinkish color of the flint and the waxy feel of the surface. There was a pot lid flake scar on one surface. The breaks were uneven and appear to have been done

during manufacture. The dimensions were length 3.2 cm, width 2.5 cm and thickness 0.5 cm.

5. Chopper/crusher. There was heavy battering along the lateral edge and on both ends near the cortex. The heavy battering indicated it was possible that this tool was also used as a hammer stone. The dimensions were 3.7 cm x 4.8 cm x 6.1 cm.
6. Quartzite hammer stone. There was a slight amount of battering on one end. Quartzite was commonly used for hammer stones due to its hardness. The dimensions were 4.0 cm x 4.2 cm x 8.3 cm.
7. Quartzite mano fragment. The flat surface had striation visible to the naked eye and polish on it. There was also some light battering along the curved edge indicating its use as a hammer stone. The dimension were 3.6 cm x 3.8 cm x 7.5 cm.

41KM203 ARTIFACT ANALYSIS

1. Chert mano fragment. This artifact had natural weathering and pitting on the end and one surface. There were two flakes removed from the original surfaces. One began at the edge of the break and appeared to be cultural. The other was on the end and appeared to be heat-or weather-induced. The bottom was highly polished from use probably as a mano grinding stone. There were some peck marks on the smooth surface. The dimensions were length 10.8 cm, width 6.6 cm and thickness 5.7 cm.
2. Chopper made from a river-rolled cobble of chert. The flaking on this specimen was done after it was removed from the river. The cortex is brown to brownish-yellow. The flaking done on the steep edge exposed gray brown-chert. At the edge of the flaked portion was heavy battering. This indicated the tool was used for chopping or smashing. The dimensions were length 7.3 cm, width 6.6 cm and thickness 3.0 cm.
3. Quartzite mano fragment. The specimen had smoothing on both flat surfaces indicating it was used on both sides. The dimensions were length 8.9 cm, width 4.6 cm and thickness 5.2 cm.
4. Biface preform fragment. This artifact was broken during manufacture. Exposed in the broken end were a small area of crystals. The inclusion with the crystals was seen as the gray, rough portion of the surface on both sides. When the shock wave from the impact to remove a flake hit the inclusion, the preform broke perpendicular to the flat surface. The dimensions were length 5.5 cm, width at break 2.3cm, width at base 3.2 cm and thickness 0.8 cm
5. Ensor-Frio dart point. Tip may have been broken by impact as indicated by lip remnant on the break. One shoulder was gone. It appeared there were remnants of a break that was

initiated from the point on the area where the shoulder was. There was an attempt to rework one lateral edge. Part of the one stem lateral edge was missing. The time period is Transitional Archaic, 200 BC-600 AD (Turner and Hester 1999). The dimensions were length 3.5 cm, width 2.3 cm, thickness 5.4 cm, stem length 1.0 cm, stem width remaining 2.0-2.4 cm and stem thickness 0.5 cm.

41KM209 ARTIFACT ANALYSIS

1. Edge-modified uniface. The thin lateral edge from the base to midway from the tip had some dulling and small flakes on the flaked surface. This was indicative of short-term use as a scraper. The pinkish tinge in the flint may have been from heat-treatment. The dimensions were length 4.5 cm, width 3.1 cm, thickness 0.9 cm.
2. Quartzite hammer stone. Battering was seen on several of the rounded edges indicating it was used as a hammer stone. The dimensions were 5.0 cm x 6.7 cm x 9.2 cm.

41KM215 ARTIFACT ANALYSIS

1. Travis dart point with heavy patina. A small impact flake scar was seen on the break at the tip. A flake was seen on one lateral edge near the tip. There was no patina seen on it indicating it was a recent break. The time period is Middle Archaic, 2,500 BC-1,000 BC (Turner and Hester 1999). The dimensions were length 5.6 cm, width 2.2 cm, thickness 0.9 cm, stem length 1.6 cm, stem width 1.7 cm and stem thickness 0.8 cm.

41KM216 ARTIFACT ANALYSIS

1. Quartzite mano. This was a river rolled cobble of quartzite used as a grinding stone. One portion of the grinding surface is curved and was smoother than the other surface. The dimensions were 9.5 cm x 10.0 cm x thickness 4.6 cm.
2. Quartzite mano. This was a river-rolled small cobble of quartzite used as a mano. The side that had the dark area on it was the grinding surface. This surface was smoother than the other side. Striation could be seen on this side with the naked eye. The dimensions were 5.9 cm x 7.8 cm x thickness 3.3 cm.
3. Marshall dart point fragment. The curved shape of the break indicates it was done during manufacture. It may have been broken while attempting to rework it. The time period is Middle Archaic (2,500 BC-1,000 BC). The dimensions were length 3.2 cm, width 2.7 cm, thickness 0.7 cm, stem length 1.1 cm, stem width 1.5-1.8 cm and stem thickness 0.6 cm.

4. Godley dart point. A burin fracture was along one lateral to the base of the notch. This indicated that it hit a hard object and was broken during use. The time period is Late Archaic to Late Prehistoric (1000 BC-after 600 AD). The dimensions were length 4.3 cm, width 1.8 cm, thickness 0.7 cm, stem length 0.8 cm, stem width 1.2-1.4 cm and stem thickness 0.5 cm.
5. 1890 plain "V" nickel. The obverse was dark and pitted and scratched. This side was in contact with the ground surface. The reverse was dark and had pitting seen under 10x magnification. The reverse was in better condition than the obverse.
6. Biface with patina on both sides. It may have been a dart point that broke and was discarded. There was no patina on the lateral edges indicating an attempt to rework it. The dimensions were length 5.1 cm, width 2.4 cm and thickness 0.7 cm.
7. Early triangular dart point. The bevel edge on each side is very characteristic of this point. The time period is late Early Archaic, 3,800 BC-3,000 BC (Turner and Hester 1999). The dimensions were length 3.3 cm, width 3.3 cm, thickness 0.6 cm, base depth 0.2 cm.

41KM227 ARTIFACT ANALYSIS

1. This was a quarry blank that was abandoned. It was white on one side and had gray to brown cortex on most of the other surface. Most of the total number of flakes removed were taken from the white surface. It was abandoned because it was poor quality chert with inclusions and faults. The dimensions were length 14.0 cm, width 8.7 cm and thickness 3.1 cm.
2. This was a quartzite mano fragment. One surface was very smooth, almost polished in spots. The other side was rough on the central portion and smooth toward the edges. The dimensions were length 5.6 cm, width 4.7 cm and thickness 2.0 cm.

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HAFTED BIFACE TOOL FROM BREWSTER COUNTY, TEXAS

T. G. Woodward

ABSTRACT

A hafted biface found in southern Brewster County, Texas is documented and illustrated. Descriptive data are supplemented by observation derived from technological analysis.

INTRODUCTION

This bifacial flaked tool was found in 1975 in Brewster County, Texas on private land in an area north of the Big Bend National Park. It was found in a small canyon west of an abandoned adobe rancho. At the back end of the canyon there was a large shelter overhang. We did not have the tools or the knowledge at the time to do a proper excavation to see if it had been occupied, but there was no indication of smoke on the ceiling or other signs of occupation. The canyon was only about 150 meters deep, top to bottom, and 350-400 meters long. The sides were not so steep that a person could not walk along them. There was all kind of cactus and cat claw.

The tool was in situ on a small rock ledge inside of a "one person" hole in the side of a hill overlooking a drainage. Near the entrance to the hole there were pieces of what appeared to be some sort of animal trap. It consisted of several round sticks about 15 cm long with what appeared to be sinew tied to some of them. The "hole" or cave where the tool was found was no more than 1.5 meters deep and approximately 2 meters high. The tool was on a natural shelf about a meter above the floor inside the entrance.

PREVIOUS RESEARCH

To the author's knowledge, there have only been 3 or 4 of these tools found. Two of these were found by Curtis Tunnell in a cave in Sunny Glen Canyon near Alpine, Texas. Tunnell was on a field trip with Victor J. Smith, when he reached between two boulders and extracted one tool. Smith asked where it had come from and Tunnell reached in and pulled out another one, and said, "right here." These are now in the Arizona State Museum. Both are identical to the one described in this report, except they have a wooden wedge between the flint blade and the wooden haft (Tunnell 1992).

Another tool that matches the one described in this report is found in a photo in Volume 13, page 164 of the Texas Archeological and Paleontological Society. There is what appears to be a wooden wedge driven into the point where the flint blade goes through the wooden haft. It was found in the Big Bend area of Texas (Sayles 1941).

A somewhat similar tool secured with a tying element is described by Turner and Hester (1999). This is also described by George Martin (1933) as "a blade sunk into a partially split

piece of very thick sotol stalk and cemented into place with zuagilla gum. Two twigs tied parallel to the handle on each side of the blade strengthen the device. Remnants of the gum still cling to both blade and handle.”

Several of the hafted knives similar to the ones described above were recovered in Shumla and Hind's cave in the Lower Pecos region of Texas. They were used mostly for cutting sotol or agave. Edge wear analysis indicates they were sometimes used to lightly chop or hack the plant (Shafer 1986).

DESCRIPTION

The biface is made of grayish-tan chert. It is plano-convex. Side A is convex while Side B is flat (Fig 1 & 2). There are reddish-brown smudges on each side of both surface of the distal end. The distal or cutting end has been reduced to an almost flat surface for a distance of 6.26 cm. The flattened area is 1.58 cm thick. The basal edge shows some smoothness due to use, possibly from cutting soft plant material. There is micro shiny residue near the rounded end on both sides. This can only be seen under high magnification and direct light. There is a very small



Figure 1. Full view of hafted tool Side A, left and Side B, right.

break on the tip of the distal end. All remaining edges are sharp with no sign of wear. There are notches on each side of the biface very near the handle, possibly for securing the biface to the handle. There is no indication that tying was ever done. The biface measures 15.5 cm long, 6.8 cm wide at the base near the handle and 5.64 cm wide at the distal end. This biface was forced through a relieved area in the haft material, which appears to be some type of oak limb. It may have been green at the time so it would shrink around the biface when dry holding it firmly in place. It is held in place without any glue or wedges. The limb has been roughly cut nearly in two and then broken off on each end. Each end has been beveled to remove splinters. The bark



Figure 2. Side A of the blade.



Figure 3. Side B of the blade.

has been worn off one end of the haft from the biface to the end. There appears to be use wear and/or stain marks on one end of the haft as if it were held with one hand. It is 35.45 cm long, 30.31 cm in diameter where there is no bark and 4.24 cm in diameter where bark remains. The biface is inserted approximately midway from each end in a split in the wood. The split appears to have been made with a sharp tool.

DISCUSSION

The biface hafted into a small tree limb is a very unique artifact. Only three others are documented in the literature. All are from the Big Bend Region of west Texas and appear to have been manufactured using the same technic. The only difference is that the one described in this report does not have a wooden wedge between the blade and the haft. It is suggested that over a period of time the other blades worked loose during use. The wedges may have held them firmly in place during use. The one in this report without the wedge may have had limited use and the blade had not become loose.

The use wear, stains and absence of some bark on one end of the haft suggest it was held with one hand during use. It may have been used for scrapping. There is no indication it was used as a chopping tool. The polish on one end of the blade indicates it was used on something soft, such as plant material or hides.

It is suggested that further examination be conducted on this artifact. Determining what type of wood the haft is would be useful. Residue analysis may provide detailed information about the tool's material use. Microscopic use wear analysis would prove beneficial.

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ARCHEOLOGICAL SURVEY OF 56.81 ACRES IN NORTH CENTRAL KERR COUNTY, TEXAS

Bryant Saner, Jr.

ABSTRACT

This report describes the survey of 56.81 acres near Mountain Home, Texas. Two quarry sites and a burned rock midden eroding from a cut bank are documented and recorded. A discussion of the sites is written. A short discussion of the relationship of lithic workshops to quarry sites is given. A description of the Prehistoric time periods of central Texas are not given, but can be found on page 2 of this publication. The analysis of the artifacts was conducted and can be found in the appendix.

INTRODUCTION

The Hill Country Archeological Association conducted an archeological survey on 56.81 acres in north central Kerr County, Texas, known as Medicine Bluff. The majority of the acreage is on the south side of Johnson Creek with the remainder being the creek and on the north side. The larger portion has a high bluff that is parallel to the creek providing a commanding view of the area. The owners related the origin of the name "Medicine Bluff." It is said that the Indians felt this was a sacred place and met on the upland near the bluff to hold ceremonies. The validity of this is not verified.

Three sites were discovered during the survey. A quarry site found near the highest location on the tract. An area with a quarry on one side and a lithic scatter/workshop on the other that blended together was found. The third site was a midden that was eroded in a cut bank (Fig. 1).

This area of central Texas had vast expanses of chert bearing limestone. It was Edwards limestone. Chert in thin layers and cobbles was seen throughout the region. The Native Americans visited these sites to obtain chert to make their tools and tip their weapons. The cobbles of chert were tested by removing several flakes to see if it was good quality. If it was acceptable more flakes were removed. The chert was reduced to a crude biface known as a quarry blank. The quarry blank was smaller than the cobble which allowed more to be taken back to the camp. Some of the large flakes removed during this process were taken to camp for production of tools.

ENVIRONMENTAL SETTING

Kerr County is in the southern portion of the Edwards Plateau. Edwards limestone is the predominant type of rock found on the survey tract. Along Johnson Creek are quaternary deposits consisting of gravel, sand, silt, clay and organic material. Edwards limestone is further

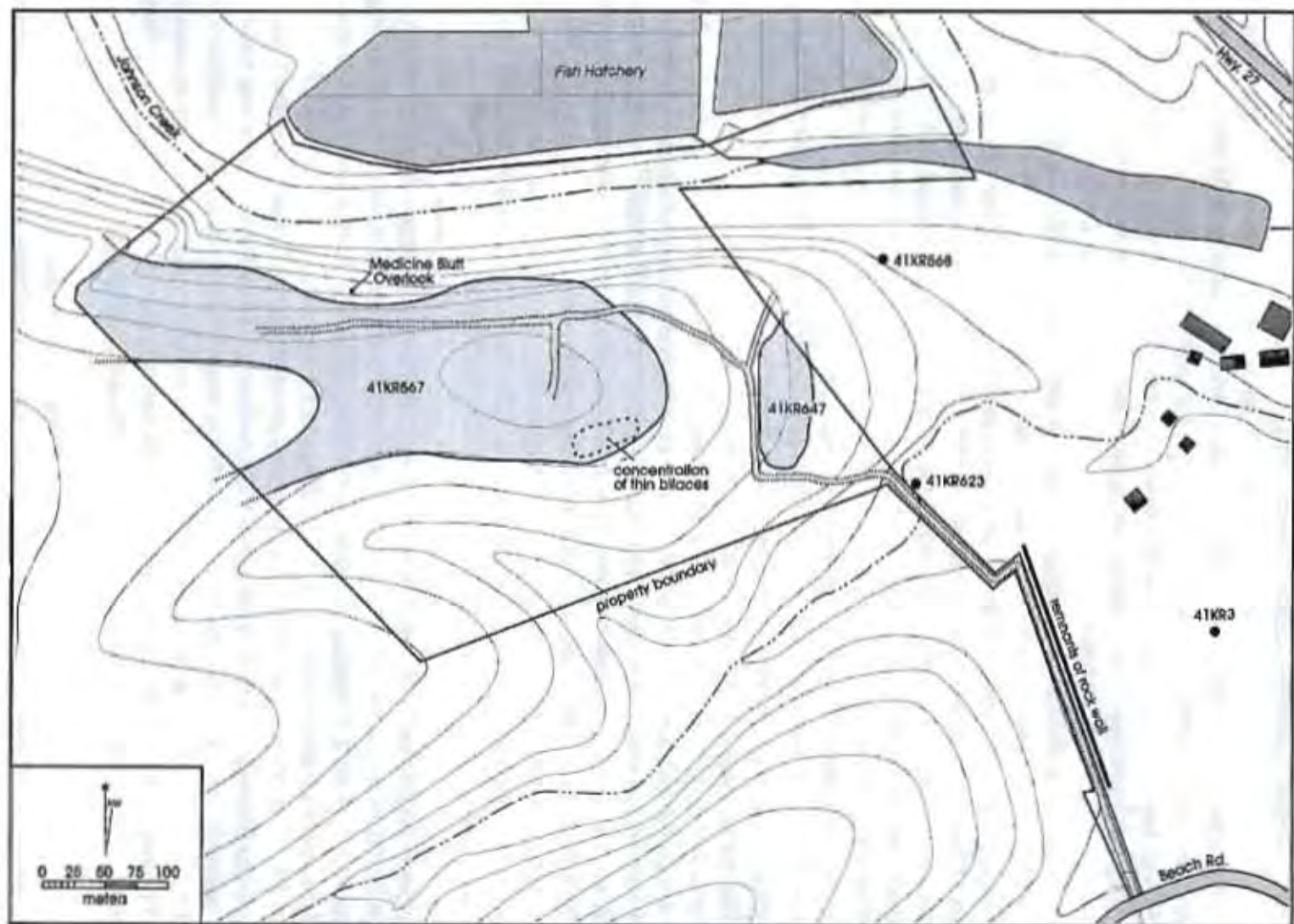


Figure 1. Medicine Bluff survey area, North Kerr County, Texas.

divided into members. In northwest Kerr County the most common are the Ft. Terrett and Segovia members. Both of these are chert-bearing limestone. On the upper elevations of the survey site Ft. Terrett member is found (Barnes 1981).

The general soils found in central and western Kerr County are Tarrat-Eckrant-Purves. The layer from the surface to about 12-18 cm is calcareous sometimes mildly alkaline, dark grayish-brown to dark gray stony, cobbly clay. Calcareous sometimes moderately alkaline dark grayish brown stony, cobbly to gravelly clay is found from 18 cm to about 38 cm below the surface. Hard bedrock limestone is found below this clay (Dittemore and Coburn 1986).

A close look at the soil specific to the 56.81 acres shows Eckrant-Comfort association, gently undulating, and Eckrant-Rock outcrop association, steep. Shallow, cobbly and stony soils associated with this group are found on upland hilltops.

The typical surface Eckrant soil is dark gray, mildly alkaline, cobbly clay to about 5 inches below the surface. The next layer, 5-9 inches, is dark grayish-brown, moderately alkaline and calcareous, very cobbly clay. Fractured limestone bedrock is beneath the second layer.

Dark reddish-brown stony clay to 8 inches below the surface makes up the surface layer of the Comfort soils. Below this, 8-14 inches below surface, is reddish-brown stony clay. Below this is bedrock consisting of indurated crystalline limestone.

The Rock outcrop is layered limestone bedrock with fractured fragments that range from 6 inches to 20 feet thick. Up to 3 inches of soil can partially cover some of the outcrops.

The survey area is in the Balconian Biotic province described by Blair (1950). Typical indigenous fauna seen in this area consist of whitetail deer, racoon, opossum, squirrel, and other small to medium sized animals. Non-native axis deer, also known as spotted Indian deer or chitel deer, are seen on the land. They were first imported from India in the 1930s. Cedar, live oak, scrub oak and cactus growing on the uplands and valley walls. Sycamore and cypress are seen along Johnson Creek. Chinquapin oak are seen in the valley.

PREVIOUS INVESTIGATION

Several archeological investigations have been conducted through the years in the Mountain Home area. In 1934 Walter Goldschmidt (1934) did archeological reconnaissance and some excavation of several sites near Camp Scenic when Highway 27 was going to be improved. Three of these sites were relocated in 1970 by Briggs (1971).

In 1970 a proposal was made to build a dam across Johnson Creek about half a mile upstream from Ingram. It was to have a 53,500 acre-foot conservation pool and was to be able to handle another 36,400 acre-feet during floods. At this stage the inundation pond would reach to the 1809 ft. above mean sea level (amsl) elevation. The archeological survey went to the 1900 ft (amsl). The site farthest from the proposed dam site that was part of the survey was on Byas Creek about 0.5 km south of the Beach Rd. at the entrance to the Medicine Bluff tract (Briggs 1971).

During the survey 63 sites were recorded. There were 44 sites with burned rock middens some had multiple middens. The total number of burned rock middens was 55. Open campsites were areas with scattered burned rock and debitage, but no definitive features. There were 16 of

these discovered. There were 3 quarry sites found during the survey. No excavation was done as it was not necessary because the dam was never built. However, important data on settlement patterns was obtained during the survey. Sites in relation to elevation, nearest water and placement in regards to terrain was recorded (Briggs 1971).

A burial at 41KR71 that involved the partial remains of a child was reported in 2003. It was recovered in the 1960s about 1.3 km ESE of the Medicine Bluff survey area. The age at death was between 2 and 4½ years. It was in good condition at the time of death. Mild cribia orbitalia was the most notable problem. This condition was caused by iron deficient anemia (Saner 2003).

In 1968 41KR3 was recorded in the field to the east of the property and northeast of the entrance road. Some trenching was done. Snail, bone, charcoal and Middle-Late Prehistoric projectile points were recovered. It was discovered that about five years prior a collector had dug in the midden. No report was written about this work, but there is information on file at the Texas Archeological Research Laboratory in Austin (O'Brien 1968).

FIELD METHODS

The Hill Country Archeological Association used five artifacts in five square meters as a definition of an archeological site. If the object was movable it was considered an artifact. If great difficulty was needed to move the artifact or if it was immovable, it was classified as a feature. Movable artifacts were debitage, tools, ground stone, burned rock and so on.

The acreage to be surveyed was outlined on a segment of Mountain Home Quad 7.5' USGS topographic map. While the surveyor was walking the property with the owner, areas of well-defined debitage concentrations were seen. The boundary was located and followed. As the boundary was determined, flagging tape was used to mark it. When the entire boundary was located and flagged, it was drawn on the topographic map. The land within the site was walked in transects to determine if the characteristics changed across the terrain. Notes were taken to record the unusual characteristics.

Artifacts that were collected were assigned an artifact field number. They were placed in plastic bags. A tag with the site number, provenience and artifact number was placed in the bag. Each artifact was plotted on the site map. An Archeological Site Data Form was filled out and sent to the Texas Archeological Research Laboratory at University of Texas at Austin. A permanent trinomial was then assigned to the site.

Field notes were written after each day of survey. The artifacts collected were analyzed. A report on the survey findings was written, published and copies sent to various archeological institutions.

SITE DESCRIPTIONS

41KR567

This is a quarry or chert procurement site. The outcrops of chert are between the 1960

and 1980 ft. amsl elevations. There is debitage and biface fragments scattered on the sloping north edge to the 1940 ft. amsl elevation. The artifacts were washed from above. This site is 450 m E/W. The east end is rounded. The west end is divided where the elevation goes above 1980 ft. The north side of the west end is about 75 m N/S while the south side is 50 m N/S. The east end is 150 m N/S.

The chert is seen as egg-shaped and tabular cobbles (Fig. 2). The material seen here is brown to gray-brown in color and high in quality. Quarry blanks, quarry blank fragments, tested cobbles and abandoned cobbles were noted. A few chopping, cutting and scraping tools were seen and some collected. Some primary cortex flakes along with secondary cortex and tertiary flakes were also seen. Several quarry blanks were collected throughout the site. On the east end thin biface fragments were collected. An unidentified Paleo-Indian mid-section of a point was recovered.

41KR623

This site is a small burned rock midden. The southern edge is exposed in a cut bank on the north side of an unnamed drainage. Fire-cracked rock (FCR) is seen on the surface starting at the edge of the cut bank. The surface FCR is 7 m N/S x 5 m E/W. The FCR is seen from the surface to 20 cm below the surface in the cut bank. The exact dimensions of the midden are unknown due to the erosion. A few tertiary flakes and a core were seen on and near the midden.

41KR647

This is a quarry or chert procurement and lithic scatter site. The elevation range is 1915 ft to 1930 ft. amsl. The upper portion 1920 ft.-1930 ft. amsl is scattered lithic concentrations with debitage widely scattered across this portion of the site. Tested cobbles, several cores, quarry



Figure 2. Nodular chert cobble eroding from the limestone on site 41KR567

blanks and several biface fragments were seen. The boundary not touching the procurement portion was somewhat ephemeral. The procurement area is 1915 ft. to 1920 ft. amsl. The chert



Figure 3. Selected artifacts from 41KR567. A-Chopper/scrapper UI-1, B-Thick biface UI-2, C-Unidentified dart point UI-9, E-Thick biface UI-21.

is irregularly shaped yellow-brown to brown cobbles nodular cobbles. The boundary of the procurement area is well-defined. On the northwest corner modern historic debris was seen.

DISCUSSION

An archeological survey was conducted on 56.81 acres near Mt. Home in Kerr County, Texas. Three sites were found and recorded. Two are chert quarry or procurement sites, and the other is a midden eroding from a cut bank.

The quarry site on the upper portion of the survey area follows elevation lines. Above the 1980 ft. elevation there is no chert, cultural or non-cultural. The outcrops stop about the 1960 ft. elevation. Below this to the 1940 ft. elevation is scattered cultural debris, but no outcrops. This material has been washed down by rainwater run-off. Heavy concentration of debitage was seen across the site.

Tabular and nodular cobbles are found on this site. The nodular cobbles are egg-shaped. The east end of the site may have been a workshop area. Unique Items, UI, 3-7 were recovered in this area. They are further along in manufacture than the majority of the other Unique Items from the site. One, UI-6, had an impact flake scar and the stem had a snap fracture scar. This may indicate a lithic workshop area.

The quarry site is between 1915 ft. and 1940 ft. elevation. The area between 1920-1930 ft. is a widely scattered lithic workshop area. There are small areas with heavier concentrations of debitage. There are no chert outcrops on this portion of the site.

The quarry portion of the site has a very definitive boundary with the workshop area at about 1920 ft. elevation. It follows an elevation. There are outcrops of lighter colored chert. The shape is uneven and is yellow-brown in color. Chert concentration on the quarry portion was heavy.

It does appear both quarry sites have workshop areas associated with them. 41KR567 is on the site while 41KR647 is next to the site. There is a small chipping station seen at 41KR558 in southern Kerr County.

Unfortunately, no time diagnostic artifacts were recovered at any of the sites. Therefore, a time period for the use of this site cannot be given. Many functional diagnostic artifacts were recovered and can give some clues as to what was taking place on these sites. Most of these relate to the collection of chert to make tools and projectile points. The midden, 41KR623, was probably used to bake plant material with an occupational area around it. Since only a small portion of the site is on the Medicine Bluff survey area, little information was obtained.

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APPENDIX A: ARTIFACT ANALYSIS BY SITES

41KR567 ARTIFACT ANALYSIS

- 1-Chopper that was made from a large flake. Ripples can be seen in the flat surface. The bulb of percussion was on the thick end. The remnants of fossilized shell can be seen on this surface. The opposite side is convex with many flakes removed. A small area of cortex is seen on this side. Battering is seen on most of the lateral edges on this side and some on the reverse side. There is smoothing of the flake scars and polish on the flake scar ridges. This was a heavy duty digging, scraping or chopping tool. Dimensions-length 118 mm, width 88 mm and thickness 33 mm.
- 2-Biface/Quarry blank with several areas of rough, low quality chert are seen on one surface. A flaw is also noted on this side. A flake was removed from the artifact in recent times as indicated by the difference in the color of the chert in the flake scar. Dimensions-length 115 mm, width 6.2 mm and thickness 3.2 mm.
- 3-Biface fragment with cortex on the unbroken end. The break is a snap or bending fracture. The cause is probably "end-shock". This is when an attempt is made to remove a flake from one end and there is no support in the middle of the artifact resulting in a snap fracture. Dimensions-length 42 mm, width 34 mm and thickness 8 mm.
- 4-Biface fragment with a curved break indicating a manufacture break. There is a short, straight portion that appears to be part of the break. However, this may be part of the original surface of the chert nodule. Note the sheen of the surface is less than that of the curved break. Near the broken end on one lateral edge is a fault in the chert. There is use wear near the tip on the opposite lateral edge from the fault. Polishing is also noted on this area. It may have been use as an expedient scraping tool after it was broken. Dimensions length 60 mm, width 39 mm and thickness 9 mm.
- 5-Biface with a small amount of cortex on one surface and a very small spot on the reverse. A flaw in the chert is noted near the proximal end. In this same area is a possible remnant of the original flake. The small light area, especially on the distal end, indicate exposure to heat. Dimensions-length 83 mm, width 47 mm, and thickness 13 mm.
- 6-Unidentifiable dart point fragment-There are several impact flake scars on the distal end. The stem and both shoulders are missing. The stem break may be a snap fracture. All these indicate an impact with a hard object. Dimensions-length 24 mm, width 24 mm and thickness 6 mm.
- 7-Biface fragment with patina on both flat surfaces. A short break is seen one end and a wide break on the other. A series of small flake scars are seen on one surface at the edge of the

- wide break. Another small flake scar is seen on the lateral edge near the near break. On the reverse side there is a flake scar. There is no patina on the surface of either break or in the flake scars indicating it is recent. Dimensions-length 25 mm, width 34 mm and thickness 9 mm.
- 8-Biface with a small ridge of chert near the distal end with multiple step terminations indicating difficulty removing this chert. On one side is a hinge flake termination that helps create the ridge. Dimensions-length 79 mm, width 42 mm, and thickness 11 mm.
- 9-Unidentifiable dart point fragment that has an impact and burin flake scars on the lateral edges on the distal end. The distal end has remnants of a snap fracture. This artifact impacted something that was very hard. A flake scar on the lateral edge near the distal end and one on the opposite lateral edge, near the proximal end are lighter in color than the rest of the surfaces. The proximal end has the same light color. This indicates recent damage. Dimensions-length 64 mm, width 23 mm and thickness 8 mm.
- 10-Biface fragment with a long, curved break can be seen on one end. Flaws in the chert are seen in the break. This could be the cause of the break. Dimensions-length 52 mm, width 62 mm and thickness 13 mm.
- 11-Biface with the distal tip is missing due to manufacture break. One area on the mid-portion of one lateral edge has multiple steep step flake terminations on the side of a chert ridge. The chert here is of lower quality than the rest of the specimen. Another area on the proximal corner has the same thing. Difficulty was encountered while attempting to remove this unwanted chert. Dimensions- length 59 mm, width 38 mm and thickness 12 mm.
- 12-Quarry blank fragment with patina on all surfaces of the artifact. A snap or bending fracture perpendicular to the lateral edges is seen. Manufacture breaks result in snap fractures when a blow is struck to the end without support in the central portion of the item being worked. This is known as "end shock". Dimensions- length 85 mm, width 64 mm and thickness 26 mm.
- 13-Expendable Core with flakes removed from this core for use as tools. The small size makes it impossible to remove anymore useful flakes and was discarded. Cortex is seen on one side. Dimensions-length 49 mm, width 45 mm and height 41 mm.
- 14-Quarry blank with a large flake removed from one surface that may be the scar of an overshot flake. It begins on one lateral edge crosses most of the flat surface, rises over a flaw in the chert and ends on the opposite lateral edge. At the terminal end part of the reverse surface was removed by this flake. There is a knot with multiple step flake terminations on the lateral edge near the distal end. Difficulty was encountered in attempting to remove this. Dimensions-length 122 mm, width 54 mm and thickness 23 mm.

- 15-Biface mid-section fragment with heat damage on one break. The other break has some remnants of lip on one half. The other half is recent damage. The lateral edges are somewhat steep and small lateral flaking is seen. On the surface near on break is the end of a flake scar that runs parallel to the lateral edges. This is an impact scar or possibly a flute scar termination. It is possible this is the remnants of a Clovis point. However, there is not enough of the point to make a positive identification. It is highly like it is Paleo. Dimensions length 40 mm, width 34 mm and thickness 10 mm.
- 16-Biface-Made from a flake. The striking remnants of the platform can be seen on one end. The bulb of percussion has been removed. Several very small spots of cortex are noted on the surface and one lateral edge. Dimensions-length 71 mm, width 51 mm, thickness 20 mm. Platform width 28 mm and platform height 16 mm.
- 17-Chopper/Smashing tool made from a quarry blank failure. The broken end was flaked and several flakes removed from the surface perpendicular to the break. This allow the tool to be held in the hand comfortably. Small polished areas near the broken end and on flake scar ridges indicate this was the end was held in the hand. Dimensions-length 63 mm, width 84 mm and thickness 33 mm.
- 18-Biface fragment proximal end. Fissures are seen on one surface. The break happened during manufacture. There is heat damage on the break and some of the steep lateral edges. Dimensions-length 39 mm, width 57 mm and thickness 12 mm.
- 19-Biface fragment with heavy patina on one surface and light patina on the other. The break was caused by a snap fracture during manufacture probably by "end shock". On the surface with the least patina is a flake scar originating at the break. There is a break that starts at the snap fracture on one lateral edge. No patina is seen in either indicating both the flake and the break are modern. Dimensions length 52 mm, width 48 mm, thickness 11 mm.
- 20-Bifacial tool with cortex on one surface. Fissures are seen on the side without cortex. On the side with the cortex polish is seen starting at the lateral edge and extending about 20 mm on the flat surface perpendicular to the edge. This indicates use as a tool to process soft material. Dimensions length 115 mm, width 94 mm and thickness 30 mm
- 21-Quarry blank with patina. Cortex is seen on both surfaces. On one lateral edge there is a steep drop. Dimensions length 89 mm, width 61 mm and thickness 25 mm.
- 22-Biface fragment proximal end. The break may be a snap fracture. Part of the lip is missing. Remnants of the curvature of the lip is seen. Dimensions length 36 mm, width 38 mm and thickness 9 mm.
- 23-Biface fragment with patina and cortex on one side. This was used as an adze without modification after the original break. Polish is seen on both points were the break meets

the both flat surfaces. There are several areas with out patina on one surface indicating recent breaks. It was a broken biface that was used as an expedient adze. Dimension length 53 mm, width 52 mm, thickness 18 mm, blade length 31 mm and blade thickness 8 mm.

- 24-Biface fragment, possible scraping tool with patina . There is a knot of chert on one surface with multiple step flake terminations on the side near the lateral edge. This indicated difficulty removing flakes in this portion of the biface. The break happened during manufacture. On one lateral edge near the break polish and use wear is note. This indicates it was used as a scraping tool after the original break. Dimensions length 58 mm, width 44 mm and thickness 16mm.

41KR647 ARTIFACT ANALYSIS

- 1-Biface fragment-It was broken during manufactures indicated by the perverse break. A knot on the right lateral edge near the break has multiple step flake terminations. A flaw in the chert is seen on side of the knot. This flaw could partially account for difficulty in removing a flake in this area of the surface. Another flaw is seen on the middle left lateral edge of the same side. It is similar to the first. Dimensions-length 88mm, width 49 mm, thickness 14 mm and thickness of knot 17 mm.
- 2-Possible hammer stone-It is a chert nodules with cortex on most of the surface. One end has is slightly pointed and the other is rounded. The rounded portion is smooth while the rest is rough. At first glance it appears to have been a mano. However, this is not the case. This end was in the limestone from which it eroded from or in the soil. It was not eroded by the weather as was the rest of the of the nodule. This may be a hammer stone only used for a short time. Dimensions-widest diameter 76 mm, distance from point to rounded end 66 mm.
- 3-Edge modified curved tertiary flake with patina noted on both surfaces. The striking platform, bulb of percussion and erailure flake can be seen on the smooth side. A flake scar ridge can be seen on the other side. The other end has a recent break. There is polish on the edge of the break. This is unexplained. The inner portion of the lateral edge has small steep flaking on th edge. This was a scraping or cutting edge. The dimensions are length 63 mm, width 31 mm, thickness11 (at the bulb of percussion) thickness near broken end 8 mm and the flaked edge 28 mm.
- 4-Biface tool with some cortex. Near the center of one lateral edge is a fault in the flint. On the lateral edge near the base is an area of cutting and/or scraping use wear. Along the edge is some polish. This biface was used as a tool. The dimensions are length 73 mm, width 48 mm thickness 20 mm and length of use wear 30 mm.

- 5-Biface with some patina and cortex on both sides. The thick white area the cortex is not patina, but remnants of the cortex. There are two areas on one of the proximal corners that are thick and have steep step flake terminations. The maker encountered difficulty removing flakes and may have abandoned the biface. The dimensions are length 88 mm, width 66 mm and thickness 25 mm.
- 6-Biface tool with some cortex on one surface. There are one portion of each lateral edge that has small flaking with use wear with some polish. This was a cutting and /or scraping tool. The dimensions are 53 mm, width 46 mm, thickness 15 mm, use wear length on lateral edges 18 and 14 mm.
- 7-Biface tool with patina on both surfaces. There is a small area of cortex near one lateral edge. There are breaks at both ends of the biface. One is old as it has patina on part of it. The other may be prehistoric, but has no patina on it. The end with patina also has flaking that starts at the edge of the flat surface and extends 5 mm on the break. This may have been used for cutting. On one lateral edge is some polish and slight battering. This may have been used for cutting and chopping. The dimensions length 85 mm, width 51 mm thickness 23 mm, end blade length 31 mm and lateral edge blade length 55 mm.
- 8-Biface tool with small areas of cortex on both surfaces and one lateral edge. The white seen on the artifact is remnants of cortex and not patina. A fault in the chert is noted at one lateral edge. The straight base has some battering on it. Near the point on one lateral edge is a flat surface on the opposite lateral edge is an area of use wear and very slight polish. The use wear on the lateral edge indicates this was used as a chopping tool. The lateral edge near the point was used for cutting and/or scraping. There is polish on the central part of the same lateral edge as the use wear. Polish is also seen on the opposite lateral edge extending toward the central portion of the flat surface. This may have been hafted. The dimensions are length 75 mm, width 48 mm, thickness 20 mm, base width 34 mm and lateral cutting/scraping edge near point 23 mm.

THE HILL COUNTRY ARCHEOLOGICAL ASSOCIATION

The Hill Country Archeological Association (HCAA) is a non-profit organization. Our purpose is to bring people together who have an active interest in the archeology and prehistory of the Texas Hill Country in an atmosphere conducive to the exchange of information and ideas. Foremost, in our activities, we promote preservation of archeological sites and offer proper training in archeological field and laboratory methods.

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