

**A Pedestrian Archaeological Survey of the  
Laurens Lane Hike and Bike Connection at the  
Salado Creek Greenway, San Antonio, Bexar County, Texas**

*by*

Cynthia Moore Munoz

Texas Antiquities Committee Permit No. 6640

**Non-Restricted**

Principal Investigator

Steve A. Tomka

*Prepared for:*  
City of San Antonio  
Park Project Services  
Parks and Recreation Department  
5800 Old Highway 90 West  
San Antonio, Texas 78227



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Center for Archaeological Research  
The University of Texas at San Antonio  
One UTSA Circle  
San Antonio, Texas 78249  
Archaeological Report, No. 434



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## **Abstract:**

In August 2013, the Center for Archaeological Research (CAR) of The University of Texas at San Antonio (UTSA) conducted a pedestrian archaeological survey of the Laurens Lane connection trail to the Salado Creek Greenway located in San Antonio, Bexar County, Texas, to fulfill contract requirements with the City of San Antonio Department of Parks and Recreation. The survey was conducted under the requirements of the City of San Antonio Unified Development Code Chapter 35 and the Antiquities Code of Texas. The survey was performed under Texas Antiquities Permit No. 6640, with Dr. Steve Tomka, CAR Director, serving as Principal Investigator and Cynthia Moore Munoz serving as the Project Archaeologist. The work was conducted in advance of construction of a multi-use greenway trail proposed by the Parks and Recreation Department of the City of San Antonio. The proposed trail runs 0.4 km from Ira Lee Road at Laurens Lane to the existing greenway trail. This report summarizes the results of the fieldwork and provides recommendations regarding the management of cultural resources located in the project area.

Pedestrian reconnaissance, site revisits, and shovel tests were used to search for cultural resources within the project right-of-way (ROW) and on City-owned land parcels immediately adjacent to the ROW. No isolated artifacts, features, or new sites were observed within the project area. Surface and subsurface cultural materials were noted in the area of both previously recorded sites located in the ROW (41BX475 and 41BX476). Because of the spatial relationship of positive shovel tests and surface artifacts between previously recorded sites 41BX474, 41BX475, and 41BX476, the CAR concludes that the three sites be combined into one site. The density and depth of buried prehistoric material on 41BX474/475/476 suggest that the site possesses potential for future research; therefore, the CAR recommends that the site be listed as potentially eligible on the National Register of Historic Places (NRHP). The CAR suggests that either the western half of the proposed Laurens Lane connection trail be moved to an alternate location or that construction of the trail be delayed until further testing of 41BX474/475/476 focused on determining NRHP eligibility is completed. The CAR also suggests that the installation of the eastern half of the proposed alignment proceed as proposed.

Artifacts collected and records generated during this project were prepared for curation according to Texas Historical Commission guidelines and are permanently curated at the CAR at UTSA.



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The successful completion of this project is owed in a large part to the able and hard-working field crew. They included Mark Luzmoor and Alex McBride of the CAR. Dr. Steve Tomka, CAR Director, served as Principal Investigator on the project and provided comments on the report. Melissa Eiring processed and prepared the artifacts and records for curation, Rick Young drafted report figures, and Kelly Harris edited and produced the final manuscript. The author thanks Samuel Sanchez, Planner/Project Coordinator of the San Antonio Parks and Recreation Department, for his assistance. The help of one and all is greatly appreciated.

## Chapter 1: Introduction

The Center for Archaeological Research (CAR) of The University of Texas at San Antonio (UTSA) was contracted by the City of San Antonio Parks and Recreation Department to conduct a pedestrian archaeological survey for the proposed Laurens Lane connection to the Salado Creek Greenway located in San Antonio, Bexar County, Texas. The survey, conducted in advance of the construction of the proposed hike and bike trail connection, occurred in August 2013. The Area of Potential Effect (APE) consists of a multi-use greenway trail. The principal goal of the pedestrian survey was to identify and document all prehistoric and/or historic archaeological sites that may be impacted by the proposed improvements within the specific APE. The archaeological survey was performed under Texas Antiquities Permit No. 6640, with Dr. Steve Tomka, CAR Director, serving as Principal Investigator and Cynthia Moore Munoz serving as Project Archaeologist.

The land impacted by the project is owned by the City of San Antonio, a political subdivision of the State of Texas. As such, the project has to comply with State Historic Preservation laws and specifically the mandates of the Antiquities Code

of Texas. The work was also coordinated through the City's Office of Historic Preservation in compliance with the City of San Antonio Unified Development Code Chapter 35.

The project consists of construction of a trail in north-central San Antonio connecting Laurens Lane at Ira Lee Road to the segment of the existing greenway trail running from McAllister Park to Eisenhower Road along the Salado Creek channel (Figure 1-1). The project area is approximately 0.4 km long and is bordered by residential neighborhoods. The right-of-way (ROW) is approximately 10 m in width but varies in different locations of the project area. The proposed project is part of the City's long-range plan to maintain, improve, and expand existing multi-use greenway trails within San Antonio.

The survey consisted of a 100 percent pedestrian reconnaissance of approximately 6.25 acres of City-owned parcels including and adjacent to the proposed hike and bike trail alignment, a pedestrian survey with shovel testing of the alignment, and revisits to previously recorded sites within the project area. Figure 1-2 illustrates the project



Figure 1-1. Aerial photograph depicting the project area.

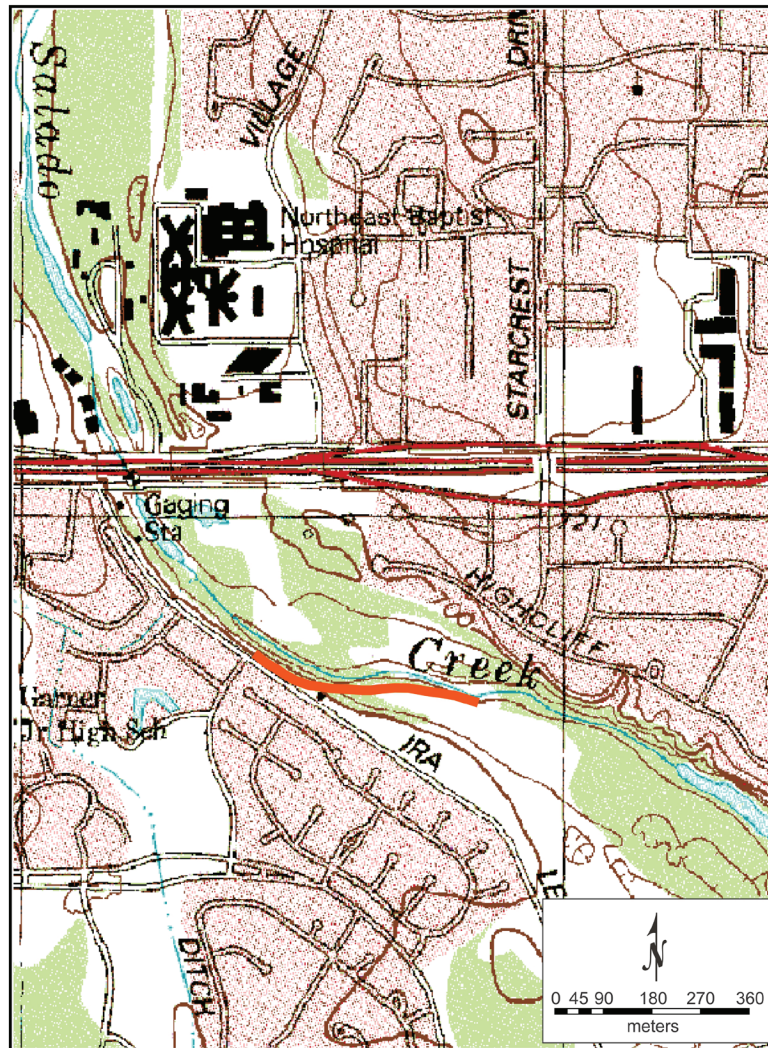


Figure 1-2. The location of the project area on the Longhorn 7.5-minute series USGS quadrangle map.

area on the Longhorn 7.5-minute series USGS quadrangle map. The reconnaissance included the hand-excavation of 14 shovel tests to identify buried cultural deposits, define site boundaries, and determine the depth of cultural material.

No new sites were identified during the survey. Two previously recorded sites (41BX475 and 41BX476) are located directly in the project ROW. Prehistoric cultural materials, consisting of lithic debitage, modified flakes, and cores, were documented scattered on the surface on the western half of the proposed trail in the vicinity of the two previously recorded sites. Nine of the ten shovel tests excavated on this portion of the APE were positive for cultural materials, including lithic debitage (n=125), cores (n=2), and one biface.

The distribution of surface and subsurface materials suggests that 41BX475 and 41BX476, as well as 41BX474 located to the west of the APE, should be combined into one

larger site. Because the proposed trail alignment crosses and will therefore impact the previously defined sites, the CAR recommends either eligibility testing be conducted at 41BX474/475/476 or that the western portion of the Laurens Lane trail connection be relocated. Recommendations will be discussed in detail in Chapter 5.

This document summarizes the results of the fieldwork and provides recommendations regarding the management of cultural resources located on the project area. This report is organized into five chapters. Chapter 2 provides a brief overview of the project area and summarizes the archaeological knowledge about the region. Chapter 3 discusses the fieldwork and laboratory methodology employed during the project. The results of the archaeological survey are presented in detail in Chapter 4. Chapter 5 summarizes the work and provides recommendations for the Laurens Lane trail connection.



## Chapter 2: Project Overview

This chapter presents a brief description of the project area environs and culture history. The chapter concludes with a summary of previous archaeological work conducted in the vicinity of the project area.

### Project Environment

The project area is located within the Salado watershed in north-central San Antonio bordered by Ira Lee Road at Laurens Lane on the west and the preexisting Salado Creek Greenway to the east. It lies adjacent to a linear stream channel, and a portion of it traverses the adjacent floodplain and terrace deposits of Salado Creek. The APE consists of an alignment approximately 0.4 km long and encompasses approximately 6.25 acres of City-owned land. The immediate project area is located in the Middle Salado watershed (Potter et al. 1995). The Middle Salado consists of approximately 25 linear km of drainage from the confluence of Panther Springs and Salado Creeks to roughly 20 km above the Salado/San Antonio River confluence. This portion of the Salado has a significant decrease in stream

gradient when compared to the Upper Salado. This lessening gradient is accompanied by broadening floodplain and terrace landforms, deeper alluvial deposits, and significantly increased stream meandering (Potter et al. 1995).

The Middle Salado meanders through the Blackland Prairie region of Texas, a biotic zone running west to east across most of central Bexar County. The Blackland Prairie is characterized by low, rolling hills with gentle slopes (Diamond et al. 1987). Elevations in the project area range from 207-213 m AMSL. This area supports a diverse assemblage of flora (Figures 2-1 and 2-2) including a variety of oaks (*Quercus* sp.), pecan (*Carya illinoensis*), cedar elm (*Ulmus crassifolia*), mesquite (*Prosopis* sp.), buffalo grass (*Buchloe dactyloides*), Texas grama (*Bouteloua rigidiseta*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), tall dropseed (*Sporobolus asper*), and Texas wintergrass (*Stipa leucotricha*; TPWD 2013).



Figure 2-1. Typical floodplain vegetation along the Middle Salado watershed.





Figure 2-2. Typical terrace vegetation along the Middle Salado watershed.

The soils in the immediate vicinity of the active channel are described as frequently flooded Tinn and Frio Soils (Tf). These soils occur as narrow, irregularly shaped areas on the floodplains of small streams and larger drainages. The Tf soils are approximately 2 m deep and typically consist of a surface layer of silty clay loam, 1.27 m, and a subsurface layer of clay loam 0.76 m (Soil Survey Staff 2013).

Climate in this general area is classified as subtropical-subhumid with hot, humid summers and mild, dry winters. Rainfall averages approximately 79 cm a year. Temperatures range from an average January low of 39°F to an average July high of 96°F. The annual growing season in Bexar County averages 265 days (Long 2013).

### Culture History

The project area lies at the intersection of two broad archaeological regions, Central Texas and South Texas. Because few archaeological sites with long sequences of stratified deposits are known in South Texas, the prehistoric sequence developed for Central Texas is often relied on to frame the prehistory of South Texas. The following culture history emphasizes Central Texas although reference is made to trends in South Texas. The discussion is based primarily on the chronologies developed by Collins (1995, 2004),

Johnson and Goode (1994), and Black (1989a) for Central Texas, with observations from Hester (2004) for South Texas. Four major time periods define South Central Texas: Paleoindian, Archaic, Late Prehistoric, and Historic. These periods are further divided into sub-periods that are based on particular subsistence strategies and material culture. A brief description of each period follows to illustrate the archaeological potential of the region.

#### Paleoindian

The Paleoindian period (11,500-8800 BP) is divided into early and late sub-periods, and each is characterized by particular projectile point styles and subsistence patterns (Collins 1995, 2004). The period begins at the close of the Pleistocene with the earliest evidence of humans in the Central Texas region. The climate during this period was generally cooler and wetter than the present. Clovis and Folsom point types, bifacial Clear Fork tools, and finely flaked end scrapers characterize the early Paleoindian period (Black 1989a). Clovis is the earliest defined cultural assemblage and is, for the most part, consistent across the North American continent. Material assemblages dating earlier than Clovis are referred to as pre-Clovis. One of the largest Clovis sites in North America, the Gault site, is located in Central Texas (Collins 1999a, b). The first stemmed points (i.e., Wilson), as opposed to lanceolate points (e.g., Golondrina), begin to appear during the late Paleoindian period.

In the past, Paleoindian populations have generally been characterized as hunter-gatherers ranging over wide areas in pursuit of now extinct megafauna, such as mammoth and *Bison antiquus*. However, research from the Wilson-Leonard site in Central Texas (Collins 1998) and other perspectives on Paleoindian adaptations (Tankersley and Isaac 1990) indicate that the diet of these early inhabitants may have been much broader. Although exploiting Late Pleistocene megafauna may have constituted a part of Paleoindian subsistence, these peoples are perhaps better characterized as more generalized hunter-gatherers, exploiting a wide variety of plants and animals including large herbivores like deer and bison (*Bison bison*) and small animals such as turtles, alligators, rabbit, and raccoons (Collins 1995; Nickels 2000).

In Central Texas, many of the sites containing Paleoindian materials are found on high terraces, valley margins, and upland locations (Black 1989a). This seems to fit with a broader pattern of Paleoindian site distributions where sites are located on landforms providing views of the surrounding landscape, are centered on critical resource zones, or are found in highly productive resource areas (Tankersley and Isaac 1990). Paleoindian artifacts are commonly recovered as isolated finds or from lithic scatters lacking good stratigraphic context including kill, quarry, cache, camp, ritual, and burial sites (Collins 1995, 2004).

Two archaeological sites in Bexar County with Paleoindian components are Pavo Real (41BX52) and St. Mary's Hall (41BX229). Pavo Real is located adjacent to Leon Creek in northwestern Bexar County. The stratified site includes an unknown, possibly pre-Clovis, component; a Paleoindian component with Clovis and Folsom artifacts; and an Early to Late Archaic component containing artifacts, hearths, and middens (Collins et al. 2003; Figueroa and Frederick 2008). The St. Mary's Hall site, located on a terrace near Salado Creek in northeast San Antonio, contains multiple components including an extensive midden with remains dating from the Middle Archaic through the Late Prehistoric. A Paleoindian component was recorded below the midden with Plainview, Folsom, and Late Paleoindian Saint Mary's Hall artifacts (Hester 1977; Hester and Kohnitz 1975).

The results from investigations at two additional sites, Richard Beene (41BX831) and the San Antonio River Mammoth site (41BX1239), suggest the possibility of Paleoindian occupations. At the Richard Beene site, adjacent to the San Antonio River in south Bexar County, excavations beneath the Perez paleosol (ca. 8600-10,000 BP) recorded a sequence of weakly developed paleosols containing Pleistocene-age faunal remains and small samples of charcoal with AMS radiocarbon dates of  $12,745 \pm 90$  BP. However, the unexpected termination of the excavations

limited the search for Paleoindian deposits. After the occurrence of a flood a decade after cessation of the project, a long-bone fragment from a mammoth was exposed on a gravel bar adjacent to the site. The bone appears to have been modified by humans (Thoms and Mandel 2007). The San Antonio Mammoth site, also adjacent to the Medina River in south Bexar County, contains the remains of two mammoths. Although cultural modification to the bones could not be proven, flotation samples from the excavation recovered micro-debitage suggesting human interaction with the remains (Carpenter et al. 2013).

## Archaic

The Archaic period (8800-1200 BP) is identified as a period of intensification of hunting and gathering and a move toward greater exploitation of local resources. As a result, a broadening of the material culture is evident, including changes in projectile points and the "extensive use of heated rock" in cooking (Collins 1995:383). Food processing technologies appeared to have broadened as features such as hearths, ovens, and middens increase in frequency during this time (Black and McGraw 1985). Large cemeteries also appeared during this period signaling the likely establishment of regional "territories" (Black and McGraw 1985). Collins (1995, 2004) and Johnson and Goode (1994) subdivided the Archaic into Early, Middle, and Late sub-periods. These sub-periods are distinguished by variances in climate conditions, resource availability, subsistence practices, and diagnostic projectile point styles (Collins 1995, 2004; Hester 2004).

## Early Archaic

In Central Texas, the Early Archaic dates from 8800-6000 BP (Collins 1995, 2004). Changing climate and the extinction of megafauna appear to have initiated a behavioral change by hunter-gatherers. Because of the necessary economic shift away from big game hunting, local resources in Central Texas, such as deer, fish, and plant bulbs, were more intensively exploited. This behavioral change is indicated by greater densities of ground stone artifacts, burned rock cooking features, and more specialized tools such as Guadalupe bifaces and Clear Fork gouges (Turner and Hester 1999). Projectile point styles found in sites from this period include Angostura, Early Split Stem, Martindale-Uvalde, and Early Basal-Notched forms such as Bell and Andice (Collins 1995, 2004; Hester 2004). Early Archaic sites are often recorded on river terraces or on hills overlooking valleys (Hester 1995:439). Open campsites, including Loeve, Richard Beene, Wilson-Leonard, Jetta Court, Sleeper, Camp Pearl Wheat, Youngsport, and Landslide, and a cave site, Hall's Cave, contain notable Early Archaic components (Collins 1995, 2004).



Weir (1976) concludes that the Early Archaic groups were highly mobile and small. He bases this inference on the fact that Early Archaic sites are thinly distributed and that projectile points are widely distributed across most of Texas and northern Mexico. The decline in bison numbers on the plains suggested to Hurt (1980) that the inhabitants were forced to expend the same or slightly more effort in order to broaden their diets to include animals and plants that produce equivalent amounts of calories and protein. Story (1985) concurs with Weir that population densities were low during the Early Archaic. She suggests that groups consisted of small bands of related individuals with “few constraints on their mobility” (Story 1985:39), subsisting on a broad range of resources, such as prickly pear, lechugilla, rodents, rabbits, and deer.

Multiple archaeological sites in Bexar County contain Early Archaic components. Recently the CAR recorded Early Archaic components along the San Antonio River at 41BX1888 in south San Antonio and 41BX1396 in Brackenridge Park. Diagnostic artifacts included St. Mary’s Hall point fragments, Angostura points, and Guadalupe adzes (Munoz and Divito 2012; Thompson et al. 2013).

### **Middle Archaic**

The Middle Archaic, 6000-4000 BP (Collins 1995, 2004), appears to have been a period of increasing population, based on the large number of sites documented from this time in Central Texas and adjacent regions (Story 1985; Weir 1976). Projectile point variation at the Jonas Terrace site suggests a period of “ethnic and cultural variety, as well as group movement and immigration” (Johnson 1995:285). Diagnostic artifacts from this period include Bell, Andice, Calf Creek, Taylor, Nolan, Bulverde, and Travis point types as well as triangular bifaces and tubular stone pipes (Black 1989a; Collins 2004; Hester 2004). In addition to the upland setting, Middle Archaic campsites are commonly located on floodplains, low terraces, and natural levees. Exploitation of broadly scattered, year-round resources such as prickly pear, deer, and rabbit continued (Campbell and Campbell 1981) with the addition of seasonal nut harvests from the riverine settings of the Balcones Escarpment (Black 1989a, b). Weir (1976) posits that the expansion of oak on the Edwards Plateau and Balcones Escarpment resulted in intensive plant gathering and acorn processing that may have been the catalyst for the widely scattered bands prevalent in the Early Archaic into larger groups merging into larger groups. These larger groups likely shared the intensive labor involved with the gathering and processing of acorns. Some investigators believe burned rock middens resulted from acorn processing (Creel 1986; Weir 1976) although others (e.g., Black et al. 1997; Goode 1991) question this argument. Black et al. (1997) suggest that

the burned rock middens of Central Texas accumulated as a result of the baking of a relatively broad range of resources in rock/earth ovens. These resources potentially included carbohydrate-laden nuts, bulbs, roots, and pads as well as various vertebrate and invertebrate animals.

Middle and Late Archaic components were recorded at the Granberg site (41BX17/271). The site, located approximately 0.3 km from the Laurens Lane project area, contained artifacts diagnostic of the Middle Archaic period including Langtry, Nolan, and Travis points (Munoz et al. 2011). Radiocarbon samples collected from two features in this component date to 3800 BP (cal 4290-4080 BP; Beta no. 215738) and 3890 BP (cal 4430-4160 BP; Beta no. 215735).

### **Late Archaic**

The final interval of the Archaic in Central Texas dates from 4000-1200 BP (Collins 2004). There is no consensus among researchers regarding population size in this sub-period. Prewitt (1985) posits an increase while Black (1989a) believes population remained the same or decreased. There is also disagreement as to the continuing use of burned rock middens. Prewitt (1981) suggests the near cessation of the midden construction, whereas excavations at a number of sites document large cooking features up to 15 m in diameter (Houk and Lohse 1993; Johnson 1995; Mauldin et al. 2003). Bison reemerge during this sub-period in Central Texas after evidence of a definitive decrease during the Middle Archaic (Dillehay 1974). Points from the Late Archaic sub-period are generally smaller than those of the Middle Archaic and include Pedernales, Kinney, Lange, Marshall, Marcos, Montell, Castroville, Ensor, Frio, and Darl types (Collins 1995, 2004; Turner and Hester 1999). Late Archaic sites are usually located near modern stream channels and occur in all topographic settings (Black 1989a; Hester 2004). During this period, large cemeteries were formed indicating an increasing population and the subsequent establishment of territories (Black and McGraw 1985). The earliest occurrences are at Loma Sandia (Taylor and Highley 1995), Ernest Witte (Hall 1981), Hitzfelder Cave (Givens 1968; Mauldin et al. 2013; Munoz et al. 2013), and Olmos Dam (Lukowski 1988).

### **Late Prehistoric**

The Late Prehistoric period (1200-350 BP) in Central Texas marks a distinctive shift from the use of the atlatl and dart to the use of the bow and arrow (Black 1989a; Collins 2004; Hester 2004; Story 1985). The Late Prehistoric is subdivided into early and late sub-periods termed Austin and Toyah Phases, respectively (Prewitt 1981). Temporal diagnostics, including Scallorn and Edwards arrow points, define the Austin Phase (1200-650 BP; Prewitt 1981). The use of



burned rock middens may have reached its peak during this phase (Black and Creel 1997). The subsequent Toyah Phase spans 650-350 BP and includes the first occurrence of pottery in South Texas (Black 1989a). Characteristic artifacts of this phase include Perdiz arrow points (Black 1986). Material culture associated with the Late Prehistoric period indicates increasing complexity in subsistence patterns and large prehistoric populations (Black 1989a; Collins 2004).

### Historic

The Historic period in South Texas begins with the arrival of Europeans. Although the Historic period theoretically begins in Texas with the shipwreck of the Narvaez expedition along the Texas coast in 1528, the majority of the inhabitants of Texas were Native Americans until the late eighteenth century (Favata and Fernandez 1993). From AD 1550 to the late 1600s, European forays into South and Central Texas were infrequent. René Robert Cavelier, Sieur de La Salle, established a French settlement, Fort St. Louis, along Matagorda Bay on the Texas coast in 1685. Hunger, disease, and escalating hostilities between the French and the Karankawas, subsequently destroyed the colony (Foster 1998). In 1690, as a result of the discovery of the remains of the La Salle colony, the Spanish began securing the northern border of New Spain, expanding their interests in East Texas

to counter any French expansion across the Mississippi River. Europeans successfully settled in the region in early 1700 (Taylor 1996). The southward incursion of the Comanche and Apache and the northward expansion of the Spanish led to the displacement of many of the area's indigenous groups. Decimated by disease brought by Europeans, many of the remaining groups sought refuge in the Spanish missions established early in the eighteenth century. The missions significantly impacted the hunter-gatherer way of life and the material culture. Artifacts from the Historic period reflect European influences and include metal, glass, and ceramics along with pre-Hispanic Goliad wares and lithic arrow points, tools, and gunflints (Taylor 1996).

### Previous Archaeological Investigations

A background review revealed nine previously recorded prehistoric archaeological sites within or in close proximity to the project area (41BX17/271, 41BX473, 41BX474, 41BX475, 41BX476, 41BX477, 41BX478, 41BX479, and 41BX482). These sites are located along and in the immediate vicinity of Salado Creek. Because the project area is located along the Salado watershed, a desirable locale for prehistoric hunters and gatherers, potential exists for additional cultural resources (Figure 2-3).

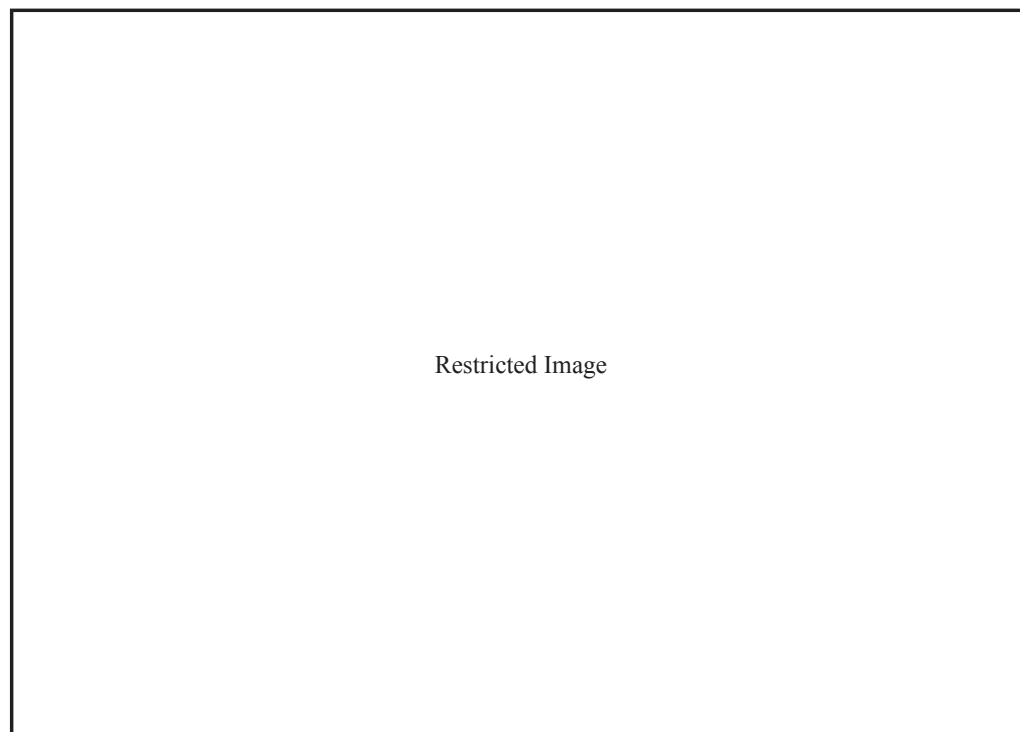


Figure 2-3. A 2012 aerial photograph highlighting previously recorded sites in and near the project area (note: site locations are based on UTM's from the Texas Sites Atlas).

The Granberg site (41BX17/271) is immediately adjacent to the east bank of Salado Creek. The proximity of two separately recorded sites and a more accurate plotting of the earlier site, 41BX17, indicate that both are part of a prehistoric site once located on a small knoll overlooking the east bank of Salado Creek (Munoz et al. 2011). The western margin of the site known as 41BX17 originally extended at least 15 m into the highway right-of-way where Harvey Kohnitz first identified the site in the early 1960s. The majority of the site appears to extend for an unknown distance southward from NE Loop 410. Site 41BX17 was partially excavated in 1962 by Mardith Schuetz of the Witte Museum, while 41BX271 was investigated once in 1973-1974 by members of the Southern Texas Archaeological Association (STAA) and again in 1979 by UTSA (Galin 1979; Hester and Kohnitz 1975; Jones et al. 1979; Markey 1979). UTSA conducted archaeological significance testing at 41BX17/271 in 2006. The distribution of the artifacts, the geomorphic investigations, the radiocarbon assays, and the temporally diagnostic artifacts indicate the presence of Middle and Late Archaic archaeological materials with good stratigraphic integrity. Radiocarbon dates and temporally

diagnostic artifacts suggest that prehistoric human occupation at the Granberg site spanned 3,000 years from the Middle Archaic to the Late Archaic (Munoz et al. 2011). The total span of occupations encompasses a period from about 4000 BC to AD 1200 as evidenced by the styles of projectile points uncovered from these early excavations (Córdova et al. 2005; Munoz et al. 2011; Schuetz 1966; Thompson 2006).

In August of 1977, UTSA conducted an archaeological survey along Salado Creek as part of the Tobins Oakwell Farm project. This survey documented ten prehistoric sites with eight near the project area: 41BX473, 41BX474, 41BX475, 41BX476, 41BX477, 41BX478, 41BX479, and 41BX482. Six of the sites were considered lithic scatters, one a lithic scatter with a possible deflated midden (41BX476), and one a quarry (41BX479). No subsurface testing was conducted. Of the sites, six were deemed ineligible and two potentially eligible (41BX476 and 41BX479) for listing to the NRHP (McGraw and Valdez 1977; Munoz 2008). Two of the sites (41BX475 and 41BX476) are on the proposed trail extension (see Figure 2-3).

## Chapter 3: Field and Laboratory Methods

As part of the archaeological services provided to the City of San Antonio Parks and Recreation Department, and in accordance with the Texas Historical Commission guidelines, the CAR was contracted to conduct the following Phase I fieldwork: 1) complete a linear intensive pedestrian survey accompanied by shovel testing of the 0.4 km alignment located between Laurens Lane at Ira Lee Road and the existing Salado Creek hike and bike trail; 2) revisit and shovel test previously recorded sites along the project ROW to establish site boundaries; 3) complete intensive pedestrian reconnaissance of the City-owned parcels adjacent to the alignment; and 4) if feasible, assess the NRHP eligibility of any newly discovered sites and determine if the sites are considered not eligible or eligible for the NRHP or if further investigation is recommended.

### Field Methods

The project area consists of an easement measuring approximately 0.4 km and 6.25 acres of City-owned parcels including and immediately adjacent to the alignment. The

area includes active channel, floodplain, and terraces within the portion of the Salado watershed located between Laurens Lane at Ira Lee Road and the existing Salado Creek Greenway trail in north-central San Antonio (Figure 3-1). A combination of methods was used during the survey including pedestrian surface reconnaissance, site revisits, and shovel testing.

The archaeological investigation of the alignment consisted of a pedestrian survey accompanied by shovel testing with additional shovel testing within the ROW in the vicinity of previously recorded sites. Based on the alignment length, excavation required to fulfill the Texas Historical Commission (THC) minimum survey standards for linear projects less than 30 m wide was a minimum of four shovel tests (STs), at a density of 16 STs per mile.

Four shovel tests were evenly distributed along the ROW on the floodplain overlooking the active channel on the eastern half of the alignment. Initially, no shovel tests were planned for the western half of the alignment because of a steep slope leading to the creek channel. A surface reconnaissance

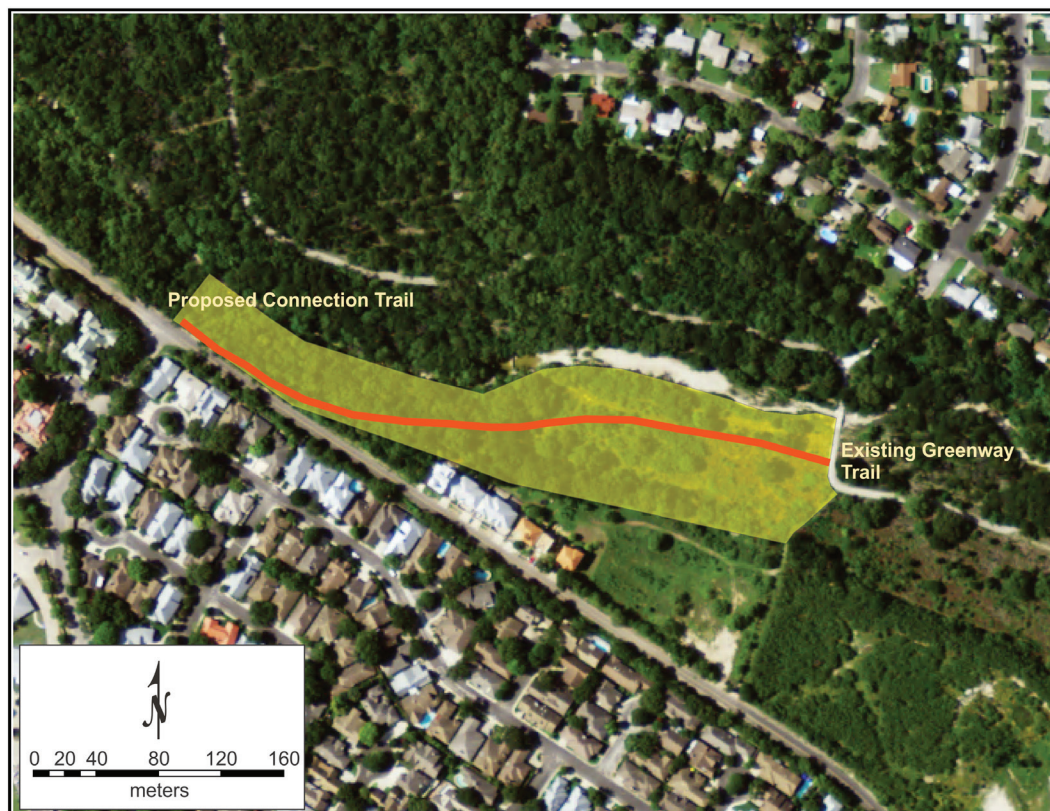


Figure 3-1. The location of the project area with the proposed connection trail (red) and surveyed parcels (yellow).

of the alignment revealed lithic artifacts eroding out of the terrace along the steeply sloped western portion. The artifact concentration falls in the area of two previously recorded sites, 41BX475 and 41BX476. Ten shovel tests were excavated on the narrow strip of terrace between Ira Lee Road and the steep drop-off to the creek to delineate the boundary of the exposed cultural material and to further delineate the boundaries of 41BX475 and 41BX476. Nine of the 10 were positive for cultural material. Overall the pedestrian survey of the alignment resulted in the hand excavation of 14 shovel tests (Figure 3-2).

Shovel tests were 30 cm in diameter and, when possible, extended to a depth of 60 cm below the surface (cmbs). They were excavated in 10-cm increments, and all soil from each level was screened through ¼-inch hardware cloth. All encountered artifacts were recovered with appropriate provenience for laboratory processing, analysis, and curation. A shovel test form was completed for every excavated shovel test. Data collected from each shovel test included the final excavation depth, a tally of all materials recovered from each 10-cm level, and a brief soil description (texture, consistency, Munsell color, and inclusions). Any additional observations considered pertinent were included as comments on the standard shovel test excavation form.

In addition to the pedestrian survey of the alignment, the CAR completed a 100 percent pedestrian reconnaissance of the approximately 6.25 acres of City-owned parcels adjacent to the proposed alignment. Transects, spaced approximately 30 m apart, were traversed by CAR field crew. Surface artifacts were noted and recorded with Trimble Geo XT GPS units.

For the purposes of this survey, newly encountered archaeological sites were defined as locations containing a certain number of cultural materials or features that are at least 50 years old within a given area. The definition of a site used for this project was as follows: (1) five or more surface artifacts within a 15-m radius (ca. 706.9 m<sup>2</sup>); or (2) a single cultural feature, such as a hearth, observed on the surface or exposed in shovel testing; or (3) a positive shovel test containing at least three artifacts within a given 10-cm level; or (4) a positive shovel test containing at least five total artifacts; or (5) two positive shovel tests located within 30 m of each other.

Artifacts encountered that did not meet the minimum requirements for a site were treated as isolated finds. These artifacts were recorded with a GPS unit, and their locations were plotted on the maps and aerial photographs. Only those isolated finds that were temporally diagnostic were collected.

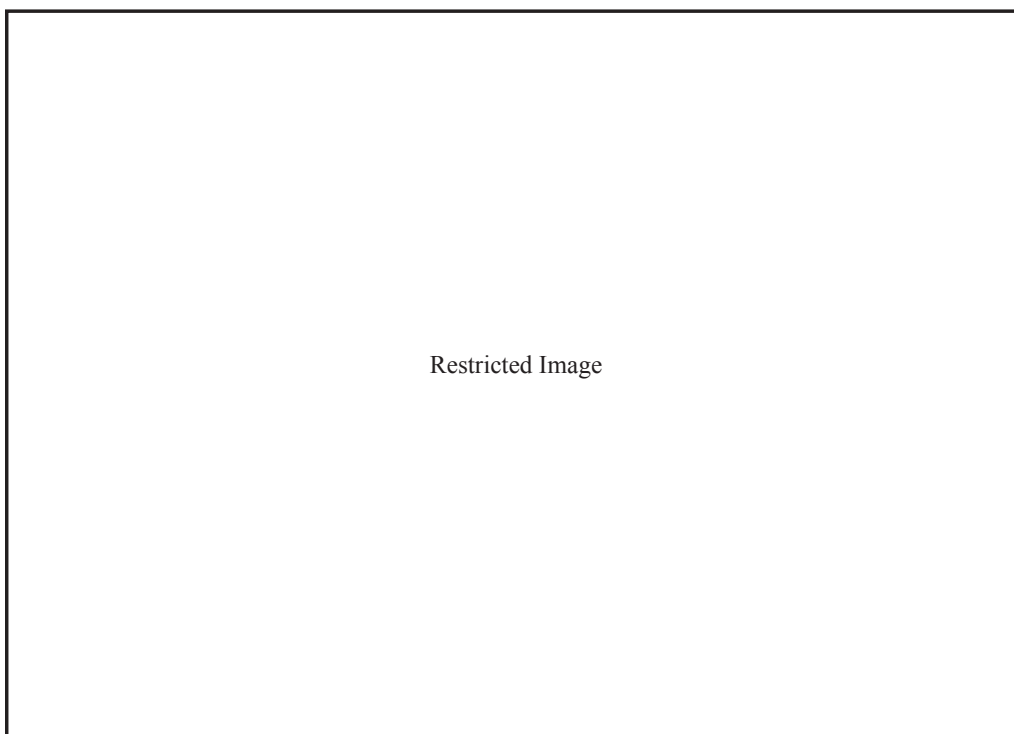


Figure 3-2. The location of positive and negative shovel tests on the project area.



## **Laboratory Methods**

All cultural materials and records obtained and/or generated during the project were prepared in accordance with federal regulation 36 CFR part 79 and THC requirements for State Held-in-Trust collections. Artifacts processed in the CAR laboratory were washed, air-dried, and stored in 4-mm, zip-locking, archival-quality bags. Materials needing extra support were double-bagged. Acid-free labels were placed in all artifact bags. Each label contained provenience information and a corresponding lot number written in archival ink, with pencil, or by laser printer. Tools were labeled with permanent ink over a clear coat of acrylic and covered by another acrylic coat. In addition, a small sample of unmodified debitage from

each lot was labeled with the appropriate provenience data. Artifacts were separated by class and stored in acid-free boxes. Digital photographs were printed on acid-free paper, labeled with archivally appropriate materials, and placed in archival-quality sleeves. All field forms were completed with pencil. Field notes, forms, photographs, and drawings were printed on acid-free paper and placed in archival folders. A copy of the survey report and all computer disks pertaining to the investigations were stored in an archival box and curated with the field notes and documents. Following laboratory processing and analysis, and in consultation with THC, all sediment samples were discarded. This discard was in conformance with THC guidelines. Upon completion of the project, all cultural materials and records were permanently curated at the CAR facility.



## Chapter 4: Survey Results

The survey of the proposed Laurens Lane connection to the Salado Creek Greenway was completed in August 2013. This chapter discusses the results of the pedestrian survey of the project area. The fieldwork consisted of a linear pedestrian survey accompanied by shovel testing of the alignment located between Ira Lee Road at Laurens Lane and the existing hike and bike trail. The survey revealed both surface and subsurface prehistoric cultural material near the locations of previously recorded sites, 41BX475 and 41BX476.

Fourteen shovel tests were excavated during the survey. Eight of the fourteen (57 percent) were excavated to 60 cmbs (Figure 4-1). The remaining six shovel tests were terminated at depths ranging from 25-50 cmbs due to large rocks or bedrock (Table 4-1). Shovel test soils on the eastern half of the APE (STs 1-4) were fairly homogenous, floodplain sediments and consisted of very dark gray (10YR3/1) to grayish brown (10YR5/2) compact, silty clay overlying very dark gray (10YR3/1) to light brownish gray (10YR6/2) hard to very hard, silty clay. Shovel tests on the western half of the project area were excavated into the terrace. These sediments consisted of compact, silty clay ranging in color from black (10YR2/1) to dark grayish brown (10YR3/2) over hard, silty clay ranging from black (10YR2/1) to gray (10YR5/1) to pale brown (10YR6/3). Two exceptions, STs 13 and 14 at the western end of the alignment, consisted of very dark gray (10YR3/1) compact, silty clay overlying hard soils ranging in color from dark grayish brown (10YR3/2) to brown (10YR4/3) to dark yellowish brown (10YR4/4). All excavated sediments contained small pebbles and gravels.

Initially, four shovel tests (STs 1-4) were excavated along the alignment followed by the placement of 10 additional tests to delineate cultural material noted eroding down slope on the western half of the project area and to define boundaries of previously recorded sites 41BX475 and 41BX476. Texas Sites Atlas UTM coordinates differ from the sites' locations recorded during the 1977 Tobins Oakwell Farm survey (McGraw and Valdez 1977). Figure 4-2 presents both sets of locations.

The 1977 polygons were used to define the sites for this report. At least 17 surface artifacts were recorded eroding downslope in eight locations along the proposed alignment in the vicinity of 41BX475, including four cores, three specimens of debitage, one edge modified flake, and a lithic cluster consisting of a minimum of 10 pieces of debitage and cores (Figures 4-3 and 4-4).

To determine if sites 41BX474, 41BX475, and 41BX476 were part of one larger site, the CAR staff walked the areas between the sites to record additional surface artifacts. The narrow terrace on the western half of the proposed alignment ends immediately west of the start of the alignment at Ira Lee Road at Laurens Lane. The property slopes steeply from the road to the Salado Creek channel. One additional piece of debitage was noted on the slope in the location of site 41BX474. No additional surface artifacts were recorded towards 41BX476. Ten shovel tests (STs 5-14) were excavated on the terrace to attempt to establish that 41BX475 and 41BX476 are actually one site (see Figure 4-3). Nine of the 10 were positive for lithic artifacts producing 128 pieces of debitage, one core, one biface, one uniface, and one sherd of white earthenware (Table 4-2). Spatially, the proximity of surface artifacts and positive shovel tests suggests that sites 41BX474, 41BX475,



Figure 4-1. Termination of ST 1 on the eastern edge of the alignment.

Table 4-1. Terminal Depths and Presence/Absence of Artifacts from Shovel Tests

Shovel Test	Termination Level	Depth (cmbs)	Reason for Termination	Presence of Artifacts
1	6	60		No
2	4	40	Large Rock	No
3	3	25	Large Rock	No
4	5	50	Large Rock	No
5	6	60		Yes
6	6	60		Yes
7	4	40	Large Rock	No
8	6	60		Yes
9	5	50	Large Rock	Yes
10	6	60		Yes
11	6	60		Yes
12	4	40	Large Rock	Yes
13	6	60		Yes
14	6	60		Yes

Restricted Image

Figure 4-2. Locations of 41BX473, 41BX474, 41BX475, and 41BX476 (triangles are UTM centroids and the polygons are locations from the McGraw and Valdez 1977 survey).



Restricted Image

Figure 4-3. Shovel tests and surface artifacts along the proposed alignment near 41BX475 and 41BX476.



Figure 4-4. Lithic scatter near ST 12 including debitage and cores.

and 41BX476 should be combined into one large site. Because the terrace steeply drops off to the creek channel between ST 14 and the location of 41BX474 (see Figure 4-3), additional shovel tests could not be excavated northwest of the alignment. However, surface artifacts near the alignment are roughly 30 m southeast of the outer edge of 41BX474, suggesting that the cultural material is continuously eroding out of the terrace edge.

A thin biface was recovered in Level 6 (50-60 cmbs) from ST 8. It measures 68.5 mm (maximum length) by 11.7 mm (thickness). Because the tool is broken, a measurement of width was not taken. An absence of cortex and the thinness of the biface suggest a late reduction stage tool. The uniface, recovered in Level 4 (30-40 cmbs) from ST 6, contains roughly 10 percent cortex on its worked surface. It measures 76.0

mm (maximum length) by 20.9 mm (thickness). The break morphology of both tools indicates failure during manufacture (Figure 4-5). Neither shows indications of stream rolling indicating that they were recovered in primary context.

In addition to the pedestrian survey of the trail alignment, the CAR completed a 100 percent pedestrian reconnaissance of approximately 6.25 acres of City-owned parcels adjacent to the proposed hike and bike alignment. The CAR field crew traversed the project area along evenly distributed transects spaced 30 m apart. No surface artifacts were noted on the transects. Heavy vegetation and leaf litter resulted in poor surface visibility with approximately 25 percent visibility on the eastern half of the project area and 50 percent on the western.

Table 4-2. Results of Positive Shovel Tests at 41BX475/476 (STs Listed West to East)

Level	Depth (cm)	ST 14	ST 13	ST 6	ST 12	ST 8	ST 9	ST 5	ST 10	ST 11
1	0-10	17 D	3 D	5 D	13 D, 1 WW		2 D		2 D	
2	10-20	4 D		9 D	10 D	4 D	3 D		4 D	
3	20-30	6 D	2 D	4 D	5 D	6 D		2 D		
4	30-40	2 D		3 D, 1 U	1 D, 1 C	2 D		5 D		2 D
5	40-50	1 D		1 D	NE	3 D		2 D		2 D
6	50-60				NE	1 D, 1 B	NE	2 D		

Key: D - debitage; C - core; B - biface; U - uniface; WW - whiteware; NE - not excavated

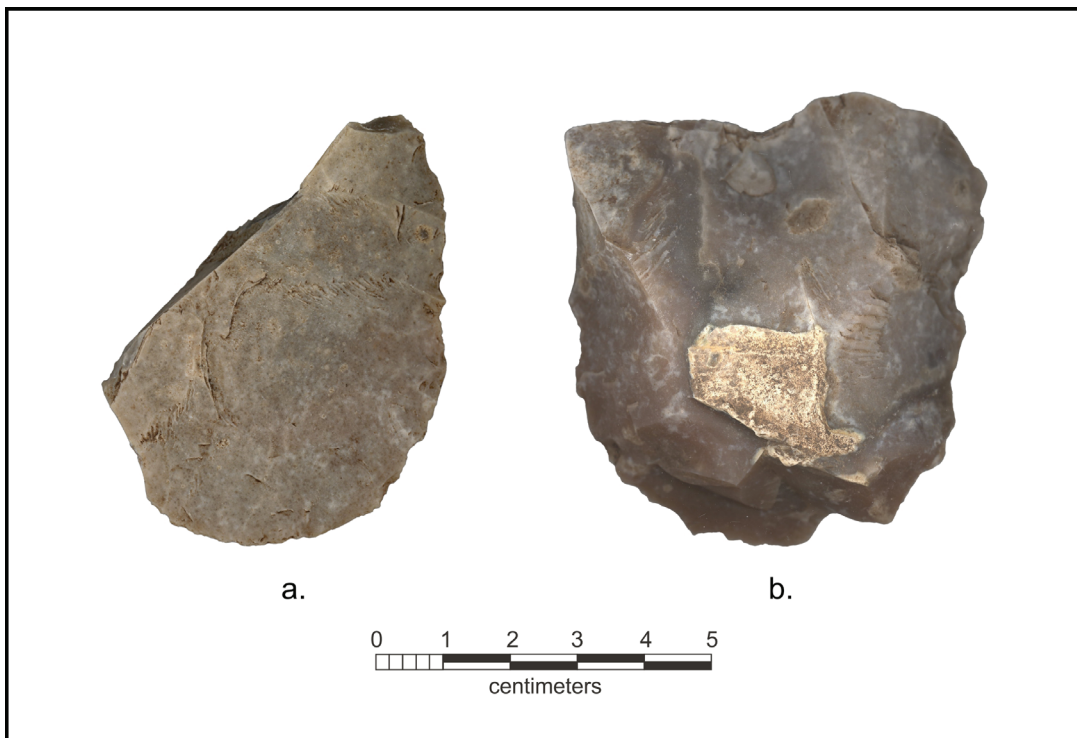


Figure 4-5. Lithic artifacts recovered (a.) thin biface from ST 8, Lev 6; and (b.) uniface from ST 6, Lev 4.



## Chapter 5: Summary and Recommendations

### Summary

The Center for Archaeological Research (CAR) of The University of Texas at San Antonio conducted a pedestrian archaeological survey of the proposed Laurens Lane connection to the Salado Creek Greenway located in Bexar County, Texas, for the City of San Antonio Parks and Recreation Department. The pedestrian survey covered approximately 6.25 acres of City-owned parcels adjacent to the proposed hike and bike alignment. The pedestrian survey included shovel testing of the alignment and revisits to previously recorded sites on the project area. This report discussed the results of the survey of this property conducted in August 2013. The archaeological work was conducted to determine whether buried cultural deposits exist in the immediate vicinity of the hike and bike alignment, to record any sites encountered, and to determine the impact of the new construction on previously recorded archaeological sites.

Fourteen shovel tests were excavated in the APE resulting in the removal of approximately 0.5 m<sup>3</sup> of sediment. On the western half of the alignment in the vicinity of previously recorded sites 41BX475 and 41BX476, at least 17 surface artifacts were recorded and 132 subsurface artifacts were recovered from 0.4 m<sup>3</sup> of sediment (330 artifacts per m<sup>3</sup>). Artifacts included debitage, cores, a biface, a uniface, and a sherd of white earthenware. Subsurface cultural material was present in all levels of shovel testing. No temporally diagnostic artifacts were recovered. No prehistoric or historic features or isolated artifacts were observed on the project area. No new sites were located. Three previously recorded archaeological sites were revisited as part of the greenway trail survey. The spatial relationship of positive shovel tests

and surface artifacts indicate that the three sites (41BX474, 41BX475, and 41BX476) are part of one larger site. The depth and amount of buried prehistoric materials recovered from 41BX475/476 suggest that the site possesses high potential for future research.

### Recommendations

The pedestrian survey of the Salado Creek Greenway project area was completed in accordance with State Historic Preservation laws and the mandates of the Antiquities Code of Texas. The work also adhered to the requirements of the City of San Antonio Unified Development Code Chapter 35. No new sites were documented during the pedestrian survey. Two previously recorded sites (41BX475 and 41BX476) are located in the APE. Due to the distribution of positive shovel tests and surface artifacts between 41BX474, 41BX475, and 41BX476, the CAR recommends that the three sites be combined into one site (as shown on Figure 5-1 on page 18).

The density and depth of buried prehistoric material on 41BX474/475/476 suggest that the site possesses potential for future research, and the CAR recommends that the site is potentially eligibility for listing on the NRHP. Therefore, CAR suggests that either the western half of the proposed Laurens Lane trail connection be moved to an alternate location (Figure 5-2, see page 18) or that construction of the western portion of the trail be delayed until further testing of 41BX474/475/476 focused on determining NRHP eligibility is completed. However, the CAR recommends that, if feasible, the installation of the eastern half of the proposed alignment proceed as proposed.

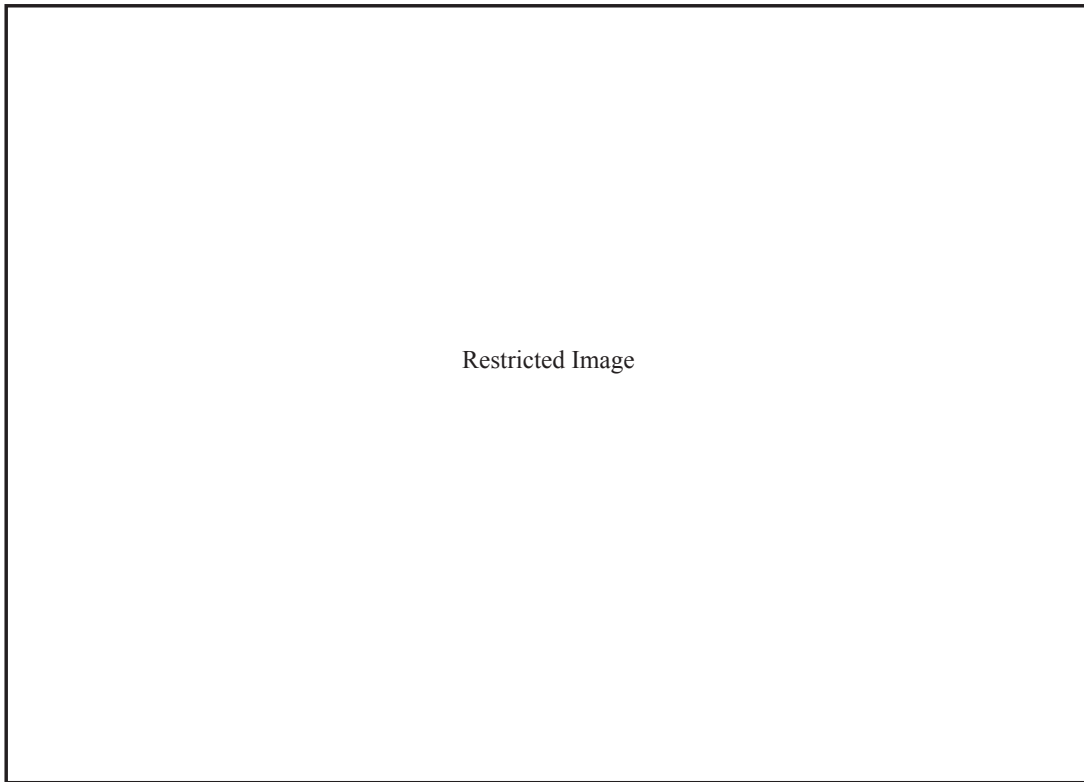


Figure 5-1. Proposed combination of sites 41BX474, 41BX475, and 41BX476 into one large site.

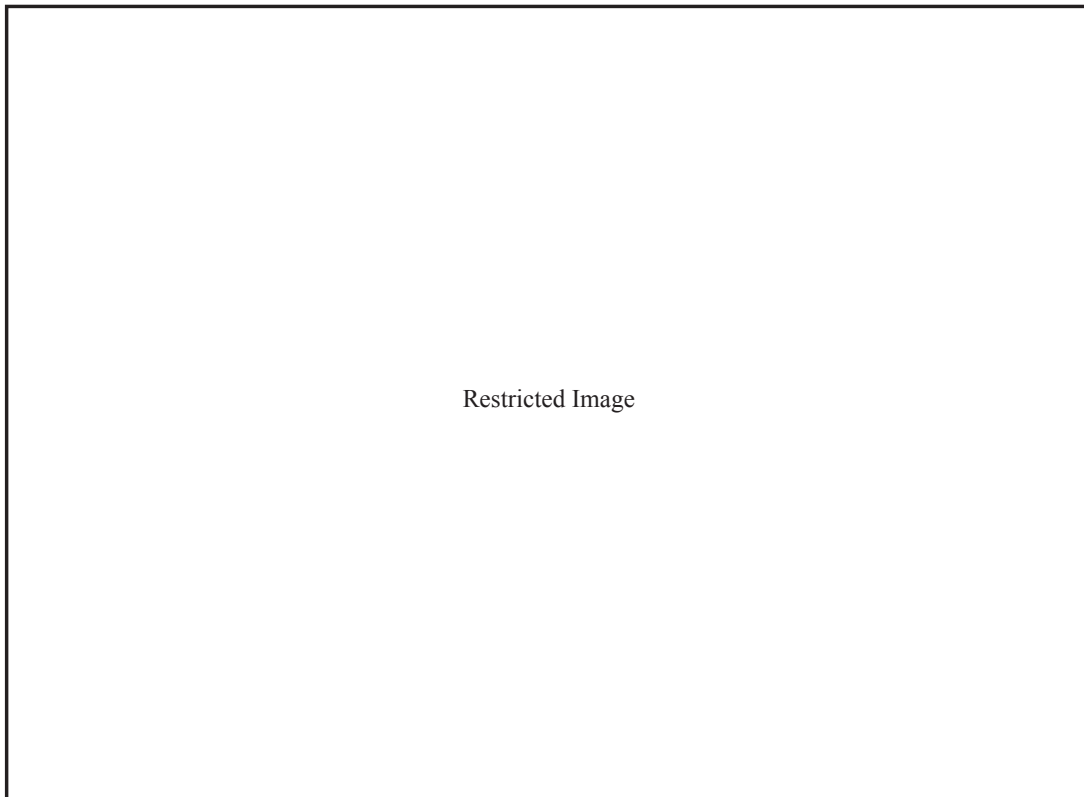


Figure 5-2. Area of avoidance on the western portion of the APE.

## References Cited:

Black, S.L.

1986 *The Clemente and Herminia Hinojosa Site, 41JW8: A Toyah Horizon Campsite in Southern Texas*. Special Report, No. 18. Center for Archaeological Research, The University of Texas at San Antonio.

1989a Central Texas Plateau Prairie. In *From the Gulf Coast to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos Texas*, edited by T.R. Hester, S.L. Black, D.G. Steele, B.W. Olive, A.A. Fox, K.J. Reinhard, and L.C. Bement, pp. 17-38. Research Series No. 33. Arkansas Archeological Survey, Fayetteville.

1989b Environmental Setting. In *From the Gulf Coast to the Rio Grande: Human Adaptation in the Central, South, and Lower Pecos Texas*, edited by T.R. Hester, S.L. Black, D.G. Steele, B.W. Olive, A.A. Fox, K.J. Reinhard, and L.C. Bement, pp. 5-17. Research Series No. 33. Arkansas Archeological Survey, Fayetteville.

Black, S.L., and D.G. Creel

1997 The Central Texas Burned Rock Midden Reconsidered. In *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas*, edited by S.L. Black, L.W. Ellis, D.G. Creel, and G.T. Goode, pp. 446-515. Studies in Archeology 22. Texas Archeological Research Laboratory, The University of Texas at Austin.

Black, S.L., L.W. Ellis, D.G. Creel, and G.T. Goode

1997 *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas*. Studies in Archeology 22. Texas Archeological Research Laboratory, The University of Texas at Austin; Texas Department of Transportation Environmental Affairs Department, Archeology Studies Program, Report 2.

Black, S.L., and A.J. McGraw

1985 *The Panther Springs Creek Site: Cultural Change and Continuity in the Upper Salado Creek Drainage, South-Central Texas*. Archaeological Survey Report, No. 100. Center for Archaeological Research, The University of Texas at San Antonio.

Campbell, T.N., and T.J. Campbell

1981 *Historic Indians of the Choke Canyon Reservoir Surrounding Area, Southern Texas*. Choke Canyon Series, No. 1. Center for Archaeological Research, The University of Texas at San Antonio.

Carpenter, S.M., C.B. Bousman, O. Potapova, L.D. Agenbroad, J.K. Hanselka, K.A. Miller, K. Lawrence, C.T. Hartneff, J. Lowe, M.C. Cody, and L. Bement

2013 *The San Antonio River Mammoth Site: Archaeological Investigations on 41BX1239 for the Interstate 37 Bridge at the San Antonio River Improvement Project, Bexar County, Texas*. SWCA Environmental Consultants, SWCA Cultural Resources Report No. 13-275, Texas Department of Transportation, Archeological Studies Program Report No. 154.

Collins, M.B.

1995 Forty Years of Archeology in Central Texas. *Bulletin of the Texas Archeological Society* 66:361-400.

1998 *Wilson-Leonard: An 11,000 Year Archeological Record of Hunter-Gatherers in Central Texas*. Studies in Archeology 31. Texas Archeological Research Laboratory, The University of Texas at Austin.

1999a *Clovis Blade Technology*. University of Texas Press, Austin.

1999b Gault Site. In *The Handbook of Texas*, edited by R.R. Barkley, pp. 117-118. Texas State Historical Association, Austin.

2004 Archeology in Central Texas. In *The Prehistory of Texas*, edited by T.K. Perttula, pp. 205-265. Texas A&M University Press, College Station.

- Collins, M.B., D.B. Hudler, and S.L. Black  
2003 *Pavo Real (41BX52): A Paleoindian and Archaic Camp and Workshop on the Balcones Escarpment, South-Central Texas*. Studies in Archeology 41. Texas Archeological Research Laboratory, The University of Texas at Austin.
- Córdova, K.J., B.K. Moses, and R.P. Mauldin  
2005 Records and Collections Assessment of Previous Investigations at Sites 41BX17 and 41BX271 (Granberg I and II) within the ROW of Loop 410 East at Salado Creek, San Antonio, Bexar County, Texas. Report on file, Center for Archaeological Research, The University of Texas at San Antonio.
- Creel, D.G.  
1986 Study of Prehistoric Burned Rock Middens in West Central Texas. Unpublished Ph.D. dissertation, The University of Arizona, Tucson.
- Diamond, D.D., D.H. Riskind, and S.L. Orzell  
1987 A Framework for Plant Community Classification and Conservation in Texas. *The Texas Journal of Science* 39(3):203-221.
- Dillehay, T.  
1974 Late Quaternary Bison Population Changes on the Southern Plains. *Plains Anthropologist* 19(64):180-196.
- Favata, M.A., and J.B. Fernandez  
1993 *The Account: Nuñez Cabeza de Vaca's Relación*. Arte Publico Press, Houston.
- Figueroa, A.L., and C.D. Frederick  
2008 *Archeological Testing of the Pavo Real Site (41BX52), San Antonio, Bexar County, Texas*. Archaeological Report, No. 382. Center for Archaeological Research, The University of Texas at San Antonio.
- Foster, W.C.  
1998 *The La Salle Expedition to Texas: The Journal of Henri Joutel 1664-1687*. Texas State Historical Association, Austin.
- Galin, D.  
1979 Gastropod Analysis 41BX271 (Granberg II Site) Summer 1979. Manuscript on file, Center for Archaeological Research, The University of Texas at San Antonio.
- Givens, R.D.  
1968 A Preliminary Report on Excavations at Hitzfelder Cave. *Bulletin of the Texas Archeological Society* 38:47-50.
- Goode, G.T.  
1991 Late Prehistoric Burned Rock Middens in Central Texas. In *The Burned Rock Middens of Texas: An Archaeological Symposium*, edited by T. R. Hester, pp. 71-93. Studies in Archeology 13. Texas Archeological Research Laboratory, The University of Texas at Austin.
- Hall, G.D.  
1981 *Allens Creek: A Study in the Cultural Prehistoric of the Brazos River Valley*. Research Report 61. Texas Archeological Survey, The University of Texas at Austin.
- Hester, T.R.  
1977 Excavations at St. Mary's Hall (41BX229): A Buried Plainview Campsite in South Central Texas. Paper Presented at the 1977 Texas Archaeological Society Annual Meeting in Arlington Texas. Manuscript on file, Center for Archaeological Research, The University of Texas at San Antonio.



- 1995 The Prehistory of South Texas. *Bulletin of the Texas Archeological Society* 66:427-459.
- 2004 The Prehistory of South Texas. In *The Prehistory of Texas*, edited by T. K. Perttula, pp. 127-151. Texas A&M University Press, College Station.
- Hester, T.R., and H. Kohnitz  
1975 Chronology and Placement of "Guadalupe" Tools. *La Tierra* 2(2):22-25.
- Houk, B.A., and J.C. Lohse  
1993 Archaeological Investigations at the Mingo Site, Bandera County, Texas. *Bulletin of the Texas Archeological Society* 61:193-247.
- Hurt, R.D.  
1980 Archeological Investigations of Portions of the Middle Concho Valley. Unpublished Master's thesis, Texas Tech University, Lubbock.
- Johnson, L.  
1995 *Past Cultures and Climates at Jonas Terrace, 41ME29, Medina County, Texas*. Office of the State Archeologist, Report 40. Texas Department of Transportation and Texas Historical Commission, Austin.
- Johnson, L., and G. Goode  
1994 A New Try at Dating and Characterizing Holocene Climates, as well as Archaeological Periods, on the Eastern Edwards Plateau. *Bulletin of the Texas Archeological Society* 65:1-15.
- Jones, C.J., J.W. Kunert, and P.M. Foster  
1979 Analysis of Debitage Material Recovered from 1979 Summer Field School Excavation of 41BX271 (Granberg II). Manuscript on file, Center for Archaeological Research, The University of Texas at San Antonio.
- Long, C.  
2013 Bexar County. The Handbook of Texas Online. Electronic Document. <http://www.tshaonline.org/handbook/online/articles/hcb07>, accessed September, 2013.
- Lukowski, P.D.  
1988 *Archaeological Investigations at 41BX1, Bexar County, Texas*. Archaeological Survey Report, No. 135. Center for Archaeological Research, The University of Texas at San Antonio.
- McGraw, A.J., and F. Valdez  
1977 *A Preliminary Assessment of Archaeological Resources at Tobins Oakwell Farms, San Antonio, Texas*. Archaeological Survey Report, No. 43. Center for Archaeological Research, The University of Texas at San Antonio.
- Markey, B.  
1979 Granberg II: 41BX271. Manuscript on file, Center for Archaeological Research, The University of Texas at San Antonio.
- Mauldin, R.P., R.J. Hard, C.M. Munoz, and J.L. Rice  
2013 Stable Carbon ( $\delta^{13}\text{C}_{\text{collagen}}$ ,  $\delta^{13}\text{C}_{\text{carbonate}}$ ) and Nitrogen ( $\delta^{15}\text{N}$ ) Isotopes from Radiocarbon Dated Hunter-Gatherers at Hitzfelder Cave, Texas. Poster presented at the 78th Annual Meeting of the Society for American Archaeology, Honolulu, Hawaii.

Mauldin, R.P., D.L. Nickels, and C.J. Broehm

- 2003 *Archaeological Testing to Determine the National Register Eligibility Status of 18 Prehistoric Sites on Camp Bowie, Brown County, Texas*. Archaeological Survey Report, No. 334. Center for Archaeological Research, The University of Texas at San Antonio.

Munoz, C.M.

- 2008 *An Intensive Pedestrian Archaeological Survey of the Salado Creek Greenway, Wetmore Avenue to Eisenhower Road, San Antonio, Bexar County, Texas Phase I: Loop 410 to Eisenhower Road*. Technical Report, No. 8. Center for Archaeological Research, The University of Texas at San Antonio.

Munoz, C.M., and N. DiVito

- 2012 Observations on a Paleoindian Component on the San Antonio River at 41BX1888. Paper presented at the 77th Annual Meeting of the Society for American Archaeology, Memphis, Tennessee.

Munoz, C.M., R.P. Mauldin, J. Thompson, and S.C. Caran

- 2011 *Archaeological Significance Testing at 41BX17/271, the Granberg Site: A Multi-Component Site along the Salado Creek in Bexar County, Texas*. Archaeological Report No. 393. Center for Archaeological Research, The University of Texas at San Antonio. Archeological Studies Program, Report No. 140. Texas Department of Transportation Environmental Affairs Division.

Munoz, C.M., J.L. Rice, K. Verostick, R.J. Hard, and R.P. Mauldin

- 2013 A Stable Isotope Analysis of Hunter-gatherers from Hitzfelder Cave, Texas. Paper Presented at the 2013 Meetings of the Texas Academy of Sciences, Kerrville, Texas.

Nickels, D.L.

- 2000 The Beisenbach Site (41WN88): A Case Study in Diet Breadth. Unpublished Master's thesis, The University of Texas at San Antonio.

Potter, D.R., S.L. Black, and K. Jolly

- 1995 *Archaeology along the Wurzbach Parkway, Module 1: Introduction, Conceptual Framework and Contexts of Archaeological Investigations in Bexar County, South-Central Texas*. Studies in Archeology 17. Texas Archeological Research Laboratory, The University of Texas at Austin.

Prewitt, E.R.

- 1981 Culture Chronology in Central Texas. *Bulletin of the Texas Archeological Society* 52:65-89.
- 1985 From Circleville to Toyah: Comments on Central Texas Chronology. *Bulletin of the Texas Archeological Society* 54:201-238.

Schuetz, M.K.

- 1966 *The Granberg Site: An Archaic Indian Habitation in Bexar County, Texas*. Witte Museum Studies No. 1, San Antonio.

Soil Survey Staff

- 2013 Web Soil Survey. Natural Resources Conservation Service, United States Department of Agriculture. <http://websoilsurvey.sc.egov.usda.gov/>, accessed August 2013.

Story, D.A.

- 1985 Adaptive Strategies of Archaic Cultures of the West Gulf Coastal Plain. In *Prehistoric Food Production in North America*, edited by R.I. Ford, pp. 19-56. Anthropological Papers No. 75. Museum of Anthropology. University of Michigan, Ann Arbor.

Tankersley, K.B., and B.L. Isaac

1990 *Early Paleoindian Economies of North America*. JAI Press, Greenwich, Connecticut.

Taylor, A.J., and C.L. Highley

1995 *Archaeological Investigations at the Loma Sandia Site (41LK28): A Prehistoric Campsite in Live Oak County, Texas*. Studies in Archeology No. 20. Texas Archeological Research Laboratory, The University of Texas at Austin.

Taylor, R.

1996 *The New Handbook of Texas in Six Volumes*. Texas State Historical Association, Austin.

Texas Parks and Wildlife Department (TPWD)

2013 GIS Vegetation Types of Texas. Electronic document, [http://www.tpwd.state.tx.us/publications/pwdpubs/pwd\\_bn\\_w7000\\_0120/woods/](http://www.tpwd.state.tx.us/publications/pwdpubs/pwd_bn_w7000_0120/woods/), accessed September 2013.

Thompson, J., K. Nichols, and S.A. Tomka

2013 *Pedestrian Survey and Data Recovery at 41BX1396, Brackenridge Park, San Antonio, Bexar County, Texas Trail Segments 12 and 12b*. Archaeological Report, No. 416. Center for Archaeological Research, The University of Texas at San Antonio.

Thompson, J.T.

2006 National Register of Historic Places/State Archeological Landmark Eligibility Testing of the Granberg Site (41BX17). Manuscript on file, Center for Archaeological Research, The University of Texas at San Antonio.

Thoms, A.V., and R.D. Mandel

2007 *Archaeological and Paleoecological Investigations at the Richard Beene Site, South-Central Texas*. Reports of Investigations 8. Center for Ecological Archaeology, Texas A&M University, College Station.

Turner, S.E., and T.R. Hester

1999 *A Field Guide to Stone Artifacts of Texas Indians*. 3rd ed. Gulf Publishing, Houston.

Weir, F.A.

1976 The Central Texas Archaic. Unpublished Ph.D. dissertation, Washington State University, Pullman.