

Report of Archeological Investigations for 2018



Richard B. Mahoney, Editor
2019

Texas Parks and Wildlife Department Report of Archeological Investigations for 2018

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Texas Antiquities Permit No. 8278



State Parks Division
Cultural Resources Program

2019



The logo for the Texas Parks and Wildlife Department Cultural Resources Program is based on the Starry-eyed Man pictograph at Hueco Tanks State Park and Historic Site in El Paso County.

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ACKNOWLEDGMENTS

The *Texas Parks and Wildlife Department Report of Archeological Investigations for 2018* was made possible through the efforts of Texas Parks and Wildlife Department (TPWD) staff. The reports published in this volume document individual efforts to address specific development and management issues on TPWD lands. The editor is thankful to the TPWD staff that contributed to and/or facilitated the completion of various field and research components that are detailed in this report.

The Texas Historical Commission (THC) Archeology Division incorporates their full complement of regional archeologists for review of projects conducted by TPWD under an annually-issued Texas Antiquities Permit. THC archeologists Jeff Durst, Casey Hanson, Bill Martin, Arlo McKee, Maggie Moore, Tiffany Osburn, and Becky Shelton are appreciated for their prompt reviews and close coordination over the previous year.

The TPWD Cultural Resources Program was supported by the State Parks Division throughout 2018. The Program is indebted for the continued support of outgoing State Parks Division Director and incoming Chief Operating Officer Brent Leisure, former State Parks Division Deputy Director and incoming State Parks Division Director Rodney Franklin, TPWD Executive Director Carter Smith, and the TPWD Commissioners. Many TPWD park managers, wildlife management area managers, project managers, and State Parks Division and Wildlife Division regional directors continue to give their encouragement to the Program. The Program relies on these staff for their ongoing efforts in preserving the irreplaceable cultural resources in the TPWD system.

Special appreciation is extended to Aina Dodge, TPWD Archeology Laboratory Director, who aptly assisted with editorial duties and provided logistical support.

Richard B. Mahoney

MANAGEMENT OVERVIEW

Organizational Background

The present organization of cultural resources management within the Texas Parks and Wildlife Department took effect in September 1992, when the Cultural Resources Program was formed. Michael Strutt serves as the Cultural Resources Program Director. The Cultural Resources Program employs six regional cultural resources coordinators who manage the cultural resources in each of the State Parks Division's six management regions (Figure 1). Each coordinator exceeds *The*



Figure 1. State Parks Division six management regions and assigned coordinators for 2018.

Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation (36 CFR Part 61) qualification standards for a professional archeologist and the Rules of Practice and Procedure for the Antiquities Code of Texas (§26.5(52)(A)) qualifications for a principal investigator.

The primary duty of the regional cultural resources coordinator is to espouse and promote ethical stewardship of cultural resources across the state. Toward that end, they coordinate with department staff and external entities on cultural resources issues, develop resource management plans, and conduct, contract, and oversee various levels of research and field investigations. Through these means, they ensure departmental compliance with state and federal regulations regarding cultural resources. In 2018, the regional cultural resources coordinators were Luis Alvarado, Dave Kroskie, Tony Lyle, Rich Mahoney, and Tim Roberts (see Figure 1).

In addition to the program director and regional cultural resources coordinators, the Cultural Resources Program employs the archeology survey team who conducts inventory and impact surveys on TPWD lands. Based at the TPWD Archeology Laboratory, a certified curatorial facility, the archeology survey team in 2018 consisted of team lead Robin Barnes, and team members Josh Gibbs, and Ben Bury. In addition to their survey team duties, the team members assist laboratory staff and offer support to the regions. Aina Dodge is the director of the laboratory facility that houses a research library, files of archeological activities on TPWD properties, workspace for analysis and report writing, and space for artifact curation. The laboratory and survey team are also supported by Toni Fischer and Marni Francell (Figure 2).

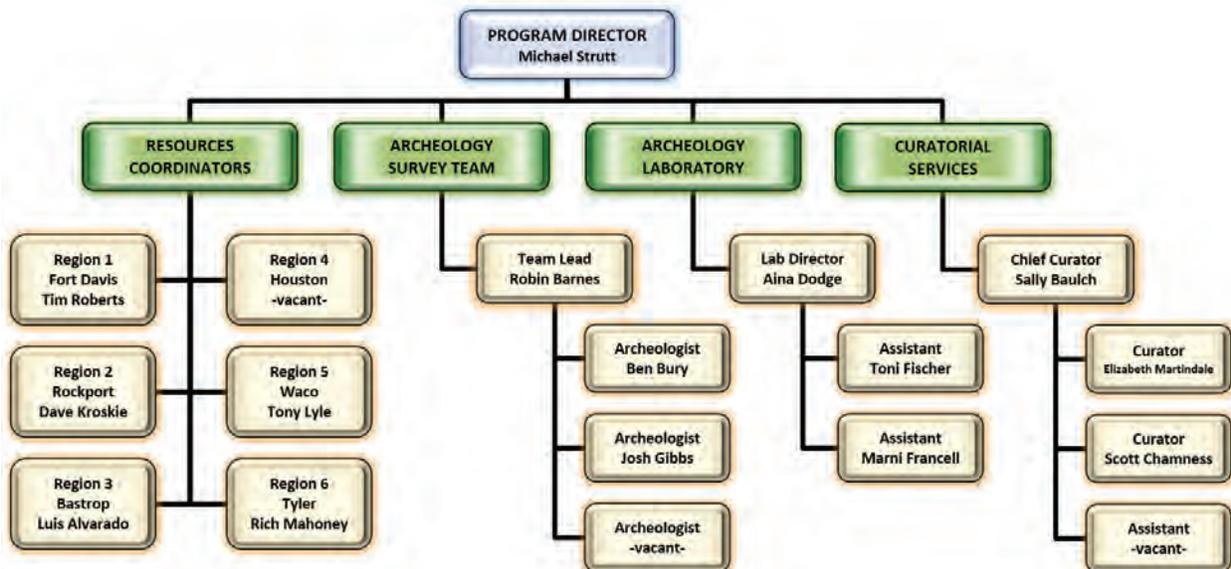


Figure 2. Organization of the Cultural Resources Program for calendar year 2018.

In 2014, the TPWD Curatorial Services Team joined the Cultural Resources Program. Curatorial Services is responsible for managing the interpretive collections of State Parks and is specifically tasked with providing the service, expertise, and support needed by staff through developing and implementing site-specific collection management, collection plans, and interpretive resources. Sally Baulch is the chief curator and, with curators Elizabeth Martindale and Scott Chamness, is housed at a facility adjacent to the Archeology Lab. Collection resources at curatorial include acquisition and catalog records, a reference library, workspace, and space for collection curation.

The TPWD Wildlife Division separately employs one cultural resources coordinator outside of the Cultural Resources Program. That coordinator, John Lowe, is responsible for regulatory review for projects occurring on Wildlife Management Areas across the state. Through an internal agreement, Mr. Lowe operates under the annual antiquities permit issued to the Cultural Resources Program.

Memorandum of Understanding

The Texas Historical Commission (THC) and the Cultural Resources Program operate under a memorandum of understanding (MOU), which permits TPWD “to perform construction monitoring, archeological surface reconnaissance, and intensive cultural surveys (including shovel and limited mechanical subsurface probing) on all properties owned or controlled by TPWD.” These investigations are authorized by an annual Texas Antiquities Permit that includes review authority of survey projects up to 200 ac in area. This document constitutes the report of archeological investigations on projects conducted in 2018 under Texas Antiquities Permit 8278. It has been completed to meet the requirements of the permit as stipulated by the MOU; the most recent version of which went into effect on 25 February 2018. The MOU has guided archeological activities of the agency since September 1992; the 2018 edition is the 26th report completed under the terms of an annual permit.

Organization of Report

This document contains a total of 18 reports of investigations carried out on TPWD properties (Figure 3). Without exception, all of these reports were authored by TPWD archeologists. Ten of the reports concern investigations conducted on State Parks, and eight cover work conducted on Wildlife Management Areas. The reports are organized alphabetically by TPWD property, with THC coordination letters as an appendix.

The majority of the individual reports contained herein have received formal review by THC for compliance under the MOU. Three of these reports were reviewed by Texas Department of Transportation (TxDOT) in lieu of THC per a programmatic agreement among Federal Highway Administration (FHWA), TxDOT, Texas State Historic Preservation Office, and the Advisory Council on Historic Preservation regarding projects that receive FHWA funds. Occasionally, reports on projects that do not require review are included in the report to add to the knowledge base of archeology or historic preservation; four such projects are reported in this edition. Those reports are for projects conducted at Balmorhea State Park, Cleburne State Park, Hueco Tanks State Park and Historic Site, and Lake Somerville State Park. Other investigations that were conducted for impact projects under the annual permit but that did not require THC review are reported to

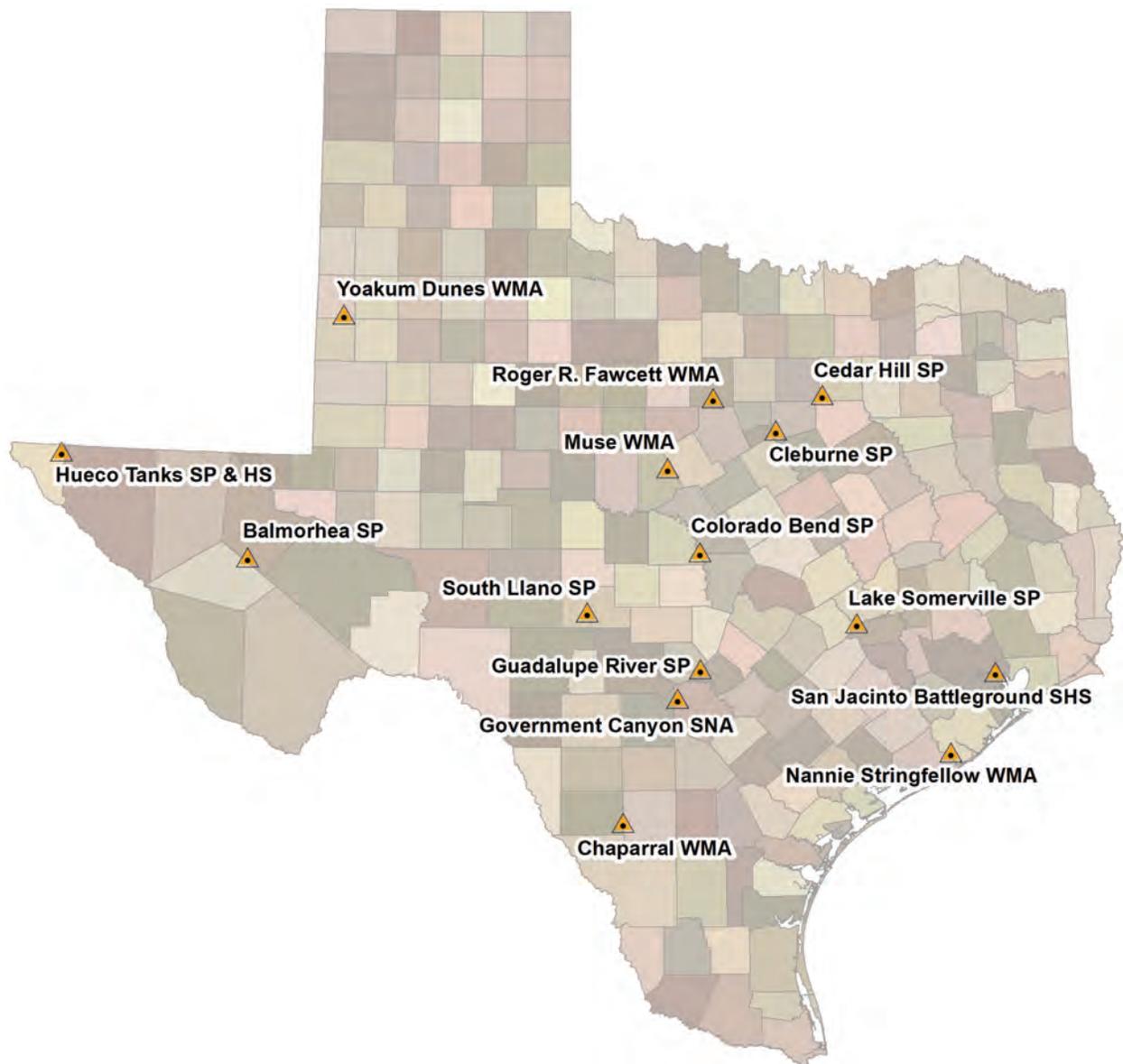


Figure 3. Properties included in the TPWD Report of Archeological Investigations for 2018. Included are State Parks (SP), State Historic Sites (SHS), and Wildlife Management Areas (WMA).

property-specific files and are maintained at the TPWD Archeology Laboratory. Such reports are made available to researchers conducting projects on TPWD lands. In addition, extraneous data which was omitted from publication of this report are maintained with said property-specific files. Examples of such data include, but are not limited to, additional digital imagery, field notes, shovel test forms, and other relevant field forms that do not readily lend themselves to this medium.

In the interest of continuing to protect sensitive cultural resources on TPWD lands, maps depicting archeological site locational data are not included in the general circulation copies of this report.

To facilitate reading flow, generic maps sans site locations are utilized within the reports instead of redacted versions or blank placeholders. Professional versions of this report contain relevant site locational data as an appendix to the document. Similar to the organization of the main body of the report, sensitive maps are presented alphabetically by TPWD property.

Summary of Findings

Fourteen projects required THC review in 2018 under Texas Antiquities Permit 8278, and 18 projects are reported in this document. The studies were conducted primarily ahead of projects that had the potential to adversely impact cultural resources. These reports detail the survey and/or reconnaissance of roughly 550 ac, documentation of 11 previously unrecorded archeological sites, and revisit of 13 previously recorded sites. Table 1 lists all of the sites discussed in this report and notes their current State Antiquities Landmark (SAL) status.

Table 1. Archeological sites discussed in this volume and their current SAL status.

Site	SAL Status			
	Designated	Recommended	Not Recommended	Undetermined
41BR606			X	
41BR609			X	
41BR616				X
41BR617			X	
41BX140		X		
41BX142				X
41BX146				X
41BX147			X	
41BX148			X	
41BX1496				X
41CQ4			X	
41CQ5				X
41EP2	X			
41HR277	X			
41JN19		X		
41KE284			X	
41KM312			X	
41LE315*				
41LE351*				
41LE352*				
41PP420			X	
41RV157		X		
41RV158			X	
41SS40			X	

* These sites occur on federal property and are not eligible for SAL designation.

ARCHEOLOGICAL SURVEY OF 70 ACRES, BALMORHEA STATE PARK, REEVES COUNTY

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ABSTRACT

Texas Parks and Wildlife Department archeologists surveyed approximately 70 ac for potential expansion of Balmorhea State Park in Reeves County. The survey was based on the Transect Recording Unit methodology originally developed for large scale surveys on the Fort Bliss Military Installation in Texas and New Mexico. In total, nine historic features, five prehistoric features, and over 500 artifacts comprising two multicomponent sites (41RV157 and 41RV158) were recorded during the survey.

INTRODUCTION

In 2018, Texas Parks and Wildlife Department (TPWD) acquired approximately 70 ac of ranchland for expansion of Balmorhea State Park in Reeves County (Figure 1). The parcel is bounded to the west by the current park boundary, to the north by State Highway 17 (SH 17), to the south by Main Canal, and to the east by Weinacht Draw (Figure 2). The San Solomon Low Canal flows northeastward through the northern portion of the parcel, roughly parallel with SH 17. During January 23-24 and August 1-2, 2018, TPWD archeologists surveyed the parcel and recorded two multicomponent archeological sites. Site 41RV157 is located in the northwest quarter of the parcel and consists of multiple prehistoric and historic features, a widespread lithic scatter, and early-to mid-twentieth century structural remains. Site 41RV158 is located in the southeast quarter of the parcel and contains early-to mid-twentieth century trash dumps and a diffuse prehistoric artifact scatter.

ENVIRONMENTAL BACKGROUND

The park lies within the northeast section of the Trans-Pecos Mountain and Basin Region, an area within the Chihuahuan Desert that includes all of Texas west of the Pecos River (Hill 1887). The 46 ac park is situated within the Toyah Basin near the foothills of the Davis Mountains to the southwest and the Barilla Mountains to the southeast. The floral community within the basin is a xeric shrub-grassland. Vegetation within the park is dominated by catclaw (*Senegalia greggii*), mesquite (*Prosopis* sp.), prickly pear (*Opuntia* sp.), creosote (*Larrea tridentate*), agave (*Agave lechuguilla*), and various grasses. The faunal community includes an array of species typical of Blair's (1950) Chihuahuan Desert Biotic Province as well as feral hogs.

The park was constructed to encompass the outflow of San Solomon Springs, an artesian discharge of 25-30 ft³/s (Ashworth et al. 1997). Between 1936 and 1941, a 1.75 ac pool was built around the springs by the Civilian Conservation Corps (Steely 2010). In 1995, a portion of the former marshland



Figure 1. Location of Balmorhea State Park.

in the spring outflow was restored. This perennial water source supports a number of unique and endangered species including the Comanche Springs pupfish (*Cyprinodon elegans*), the Pecos gambusia (*Gambusia nobilis*), a pure genetic strain of the headwater catfish (*Ictalurus lupus*), the

phantom cave snail (*Pyrgulopsis texana*), and a crustacean (*Gammarus hyalelloides*).

The majority of the soil (78.0%) within the survey area is composed of Verhalen clay, a calcareous clayey alluvium formed on basin floors and alluvial flats (Natural Resources Conservation Service [NRCS] 2018). A typical

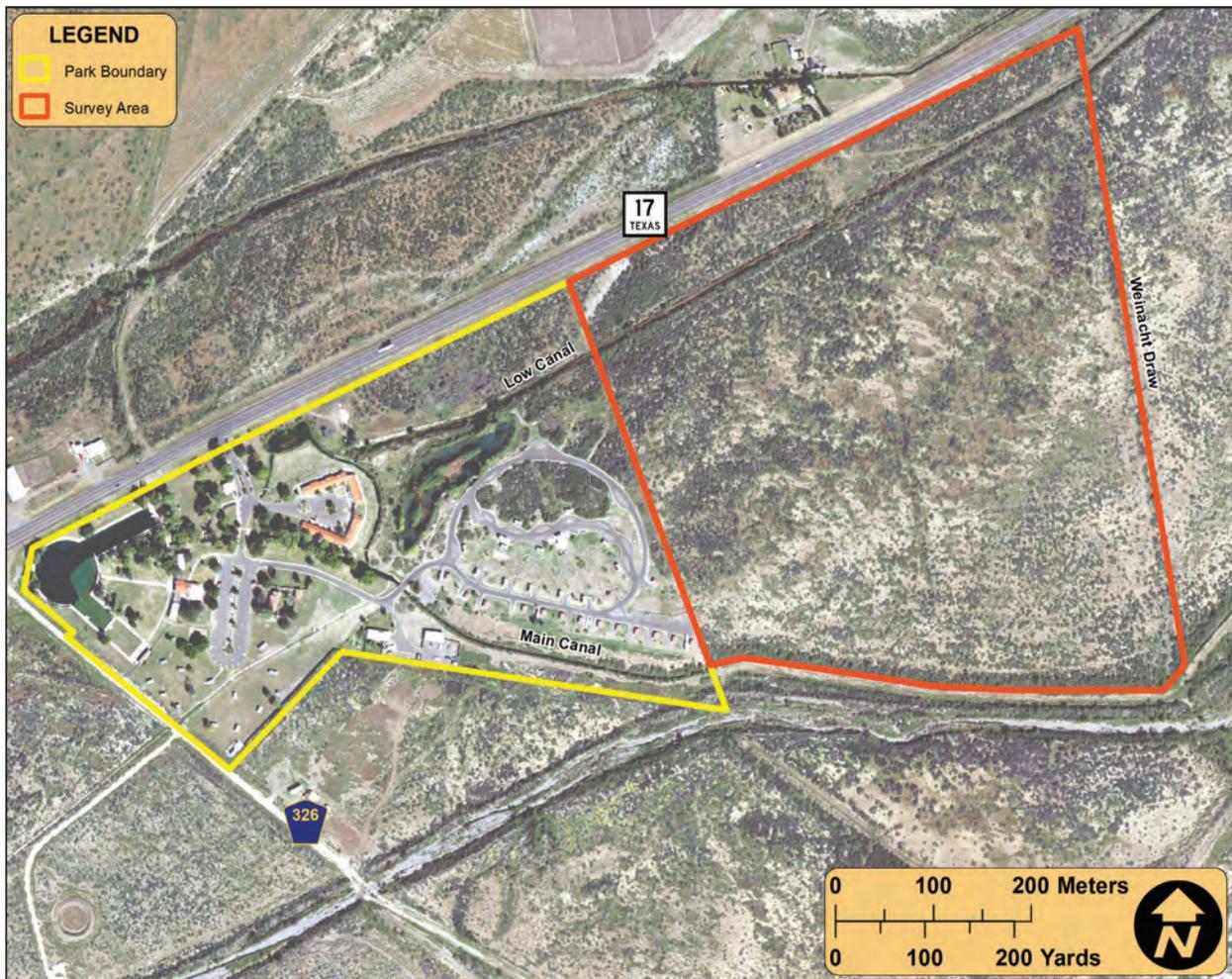


Figure 2. Recent aerial imagery showing survey area in relation to original park boundary.

soil profile includes a 25-cm thick grayish-brown (10YR 5/2) clay A horizon followed by 85 cm of a brown (7.5YR 4/2) clay Bss horizon, and 95 cm of a pink (5YR 7/4) clay Bck horizon. The remaining soil is divided almost equally between the Limpia-Mitre association (11.1%) and Toyah clay loam (10.9%). The former is a gravelly alluvium of Pleistocene age derived from igneous rock and is situated in the northwest and northeast corners of the survey area. Mitre soils typically have a 10-cm thick reddish-brown (5YR 5/3) gravelly loam A horizon overlying increasingly gravelly and calcareous B horizons. Limpia soils typically have a 30-cm thick, reddish-gray (5YR 4/2) very cobbly

loam A horizon overlying an increasingly cobbly and calcareous B horizon. Toyah clay loam consists of calcareous loamy alluvium formed on floodplains and is mapped near the upper center of the survey area. A typical soil profile includes up to 40 cm of a dark grayish-brown (10YR 4/2) clay loam A horizon overlying a light brownish-gray (10YR 6/2) BC horizon.

CULTURAL BACKGROUND

In January 1994, the Texas Archeological Research Laboratory (TARL) surveyed seven acres and monitored backhoe trenching for wetland restoration of the spring outflow near the center of the park (Carpenter 1995).

One prehistoric site (41RV22) was recorded and described as a diffuse, 40-m wide and 65-m long scatter of lithic debitage and fragmented igneous rock that may have been thermally altered. Provided the area had been previously disturbed and no features or diagnostic artifacts were recorded, the site was recommended ineligible for official designation as a State Antiquities Landmark (SAL), or for listing on the National Register of Historic Places (NRHP). No additional archeological investigations have been conducted within the park, and very little of the surrounding Toyah Basin has been surveyed. As of the writing of this report, only 128 sites have been recorded in Reeves County, and only 209 in neighboring Jeff Davis County.

Outside the park, the site in closest proximity, 41RV13, was recorded 4 km to the west during a survey for the Department of the Interior Water and Power Resources Service in 1979. The site was described as a large, low density scatter of lithic debitage and burned rock with one associated mano. During the same project, a second site (41JD63) was recorded 5.5 km west of the park at Phantom Lake Spring. Site 41JD63 was described as having five activity areas that included two ring middens, a burned rock midden, up to 40 bedrock mortars, and an extensive lithic scatter. Testing at the site indicated a potential Paleoindian component and significant occupations during the Early, Middle, and Late Archaic Periods (Charles 1994). The site was listed on the NRHP in 1995 (Register No. 95000501). For a broad overview of the prehistory of the Trans-Pecos Region, the reader is directed to Miller and Kenmotsu (2004), and to Charles (1994) and Carpenter (1995) for a regional summary.

Historically, the first Europeans to visit the area were members of the Antonio de Espejo expedition, who were guided by the Jumanos

along Toyah Creek on route to La Junta de los Rios in 1582 (Brune 1981). Presumably they camped in the area, and possibly at the springs themselves. The region was first described by Anglo Americans when Robert Neighbors and John Salmon Ford explored and mapped portions of the Trans Pecos in 1849 while charting a wagon trail to El Paso (Ford 1963; Hughes 1958; Neighbors 1954). Roughly two-thirds through their journey, they camped somewhere along Toyah Creek downstream from San Solomon Springs, at that time referred to as Mescalero Springs, and observed corn fields planted by the Apache (Neighbors 1954:50-51). They also visited a spring "at the base of the Davis Mountains" they referred to as Mescalero Springs and described an abandoned Spanish post with peach trees (Neighbors 1954:51). Although it is unclear if the spring they described was San Solomon Springs, the map of their route, known as the Ford and Neighbors Trail, clearly shows them in the Toyahvale area (Figure 3).

Little is known of the earliest Mexican settlers who occupied the area, other than they ranched and farmed, dug the first irrigation canals, and sold their crops in Fort Davis (Carpenter 1995). The first permanent European settlers, George B. Lyle and his son Robert among the better known, arrived in the area in 1871 and farmed the Toyah Valley with water from Toyah Creek (Hughes 1984). On 23 April 1873, an 800 ac parcel that encompassed the location of the current park and survey parcel, was awarded as a land grant to Antonio Balle (Abstract 235). Not much is known about this early land grant other than the area was likely used for farming corn, wheat, sorghum, or sweet potatoes similar to crops at the turn of the twentieth century (Taylor 1902:17). One artifact from this period, a .50-70 Government cartridge from ca. 1873, was

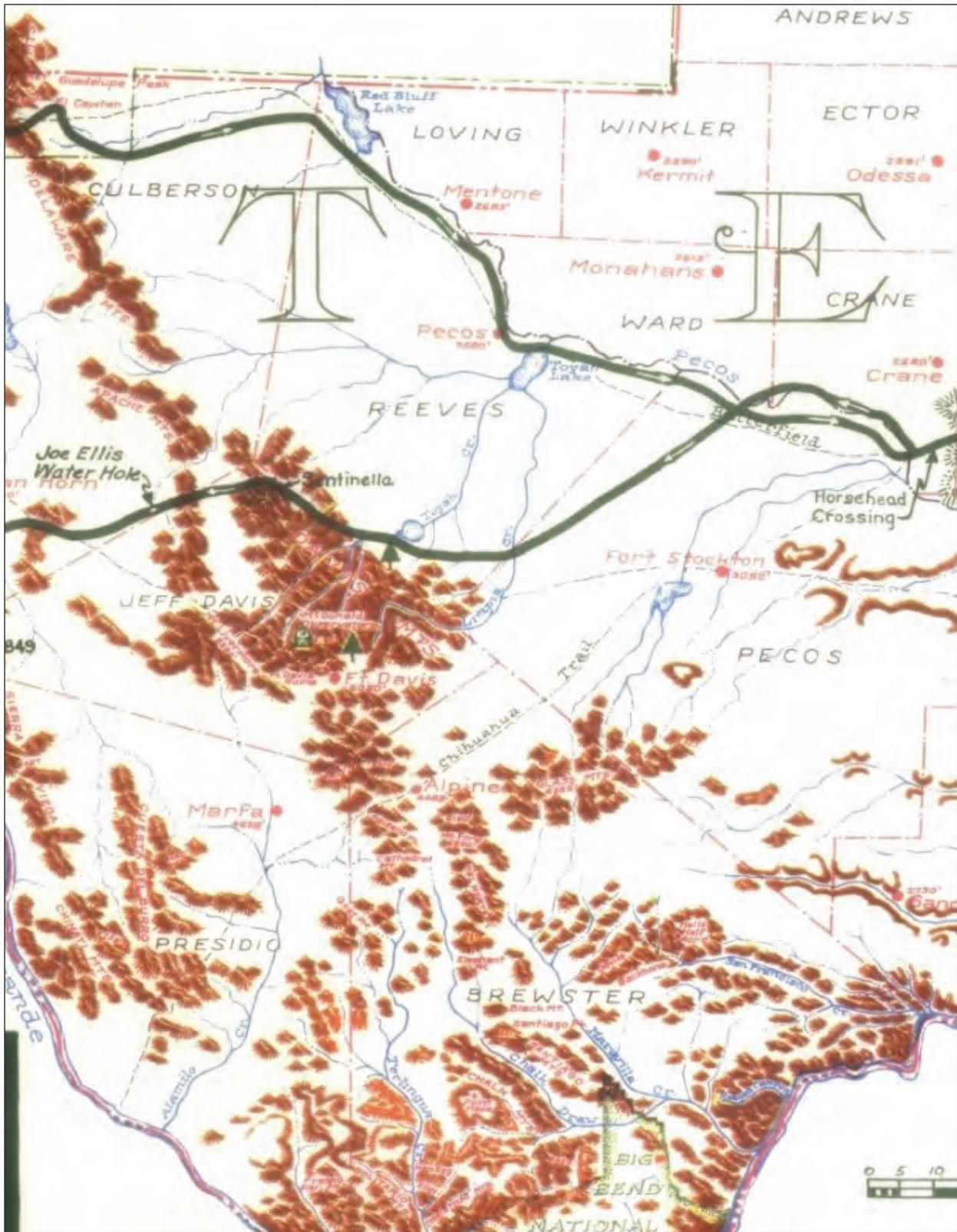


Figure 3. The Ford and Neighbors Trail.

found in the southeast corner of the survey parcel. In 1927, the Bureau of Reclamation began dredging the springs and constructing canals, and between 1936 and 1941, a 1.75 ac pool was built around the spring by Company 1856 of the Civilian Conservation Corps (Steely 2010).

METHODS

Field methods followed the Texas Historical Commission (THC) Archeological Survey Standards for Texas (THC 2014) which require pedestrian surveys to cover 100% of a project area. Transects were placed at 15 m intervals and were recorded using the Transect Recording Unit (TRU) method originally developed for work on the Fort Bliss Military Installation in Texas and New Mexico (Heilen and Murrell 2015; Kludt et al. 2007; Lukowski and Stuart 1996; Mauldin et al. 1997; Miller et al. 2009; Stowe et al. 2005).

Using this method, survey crews navigate following predefined Universal Transverse Mercator (UTM) transects. Cultural materials or observations that would not normally be documented individually during a survey (e.g. flakes, fire-cracked rocks, nondiagnostic artifacts), are recorded as a group within the extent of a predefined unit based on the transect width, in this case 15 m x 15 m. The result is a density map of cultural materials within the survey area that can later be used to define site boundaries or examine the spatial distribution of various classes of cultural materials at a low resolution (Bury et al. 2011). The method shares similarities with a non-site approach in that the archeological record is envisioned as a continuous distribution of varying densities of cultural materials in space (Camilli et al. 1988; Miller et al. 2009).

Given that ground surface visibility was 75% or greater, shovel testing was limited

in scope. Shovel tests measured 30 cm x 30 cm and were excavated in 10 cm levels with square-nosed shovels. All sediment was screened through ¼" mesh and strata were documented. Data were recorded on shovel test forms and shovel test locations were recorded with a Trimble GeoXT GPS unit. All artifacts recovered during shovel testing were collected and curated at the TPWD Archeology Laboratory in Austin, Texas. Site forms were completed with TexSite and submitted to TARL.

RESULTS

In total, nine historic features, five prehistoric features, and over 500 artifacts were recorded during the survey. With the exception of a low-density scatter of glass bottle shards and historic ceramic sherds along the south side of SH 17, the vast majority of the historic artifacts are associated with features. Of the 1,244 complete or partial TRUs in the survey parcel, 195 contain prehistoric cultural materials not comprising features. These were concentrated in the northwestern and southeastern quarters of the survey area, with a lower density of artifacts scattered between. Combined with the feature data, this distribution was used to define the boundaries of sites 41RV157 and 41RV158.

41RV157

Site 41RV157 consists of five prehistoric features, four historic features, and a diffuse scatter of prehistoric and historic artifacts located in the northwest one-third of the project area. Three soils are mapped within the site (NRCS 2018). The Limpia-Mitre association, gently sloping, occurs in the northwestern corner of the site and consists of gravelly alluvium of Pleistocene age. Toyah clay loam is mapped in the northeastern portion of the site and consists of calcareous loamy alluvium formed on floodplains. All

soils within the site south of the San Solomon Low Canal are mapped as Verhalen clay, a calcareous clayey alluvium formed on basin floors and alluvial flats (NRCS 2018). Based on the presence of gravels on the surface of the site, the Limpia-Mitre association occurs further south and east than plotted on the Web Soil Survey. The floral community is dominated by mesquite (*Prosopis* sp.), catclaw (*Senegalia greggii*), and creosote (*Larrea tridentate*), with occasional four wing saltbush (*Atriplex canescens*) and Spanish dagger yucca (*Yucca aloifolia*). Ground surface visibility ranged between 75-95% at the time the site was recorded.

Historic Features (HF)

HF-1 consists of the ruins of a rectangular structure measuring 7.3-m wide, 18.3-m long, and oriented perpendicular to the San Solomon Low Canal at a compass bearing of 329° (Figure 4). The foundation is formed from poured concrete and the walls are constructed from locally sourced cobbles cemented with concrete mortar. The walls are mostly intact, and measure 2.4-m tall on the northwest facing side and corners, and 1.4-m tall on the remaining structure where still standing. The northwest facing wall has a horizontally offset opening measuring 2.4-



Figure 4. HF-1 overview.

m wide and 1.2-m tall. The tops of the walls have a 7.6-cm wide groove with vertically oriented bolts spaced every 66-91 cm where additional wall or roofing material was once attached. The entry to the structure is in the southwest facing wall towards the northwest corner and measures 1.2-m wide. Although the function of the structure is unknown, the construction is not typical of a residence. The remnants of a concrete spring box are located 13.7 m to the northwest along the bank of the San Solomon Low Canal, and a deteriorated concrete pad is situated 5.5 m northwest of the structure's entryway.

The assemblage within the structure includes glass, ceramic, and metal artifacts. Glass artifacts (500+) include shards of clear windshield glass; green, clear, and amber bottle glass; milk glass from a cold cream jar; and blue glass, also from a jar. Ceramics (n=50+) include yellow-painted earthenware, pink-glazed stoneware, and porcelain from insulators and light fixtures. Metal artifacts (n=50+) include wire nails, nuts, bolts, wire handles, sheet metal fragments, filing cabinet frames, cone-top beer cans, a 12 gauge cartridge, a buckle, a button (collected), a spring, a cuprous cap, an elbow pipe, and an electrical light bar with porcelain insulators. Also recorded were several thick fragments of slate, some with holes drilled in them. The button is embossed with "POOLS," the name of Pool Manufacturing Company, a uniform and workwear company that was based in Sherman Texas. The company changed its name from Sherman Overall Manufacturing in 1925.

Artifacts outside the structure are concentrated south of the southeastern and southwestern facing walls. Glass artifacts (n=50+) include several clear Duraglas jars and Monahans Coca-Cola bottles; shards of clear, amber, green, and aqua bottle glass; and shards of cobalt and milk glass from

jars. Ceramics (n=25+) include whiteware, stoneware, and yellow stoneware sherds. Metal artifacts (n=25+) include straps, screen mesh, sheet metal, various sizes of sanitary cans, metal bucket lids, rebar, and coat hangers.

HF-2 consists of two sets of concrete foundation piers situated approximately 60 m northeast of HF-1 and 34 m south of SH 17 (Figure 5). The San Solomon Low Canal flows 18 m to the southeast. The easternmost



Figure 5. HF-2 overview.

set consists of four piers with concave tops arranged in a rectangle. In cross section, each pier measures 1.85-m long, 21.6-cm wide, and stands 99.1-cm high. The concavity at the top is 16.5-cm deep. The westernmost set includes six piers also arranged in a rectangle. In cross section, each measures approximately 1.19-m long, 49.5-cm wide, and stands 33-cm tall. The northeastern pier is inscribed with: "329 on," "ER," "LSB," and "Jonny," and some decorative symbols (Figure 6). The piers are aligned at 329°, which happens to be perpendicular to the canal and in line with HF-1; it is unclear if this alignment was chosen to form a right angle to the canal, or if 329° has some other significance.



Figure 6. HF-2 foundation pier inscriptions.

HF-3 consists of a 3.66-m wide and 7.62-m long pit situated 10.7 m northwest of the San Solomon Low Canal in the northwestern corner of the site (Figure 7). The pit is 1.5-m deep and contains a large piece of sheet metal, two five-gallon metal cans, wood and wire fencing, at least seven tires, and several brown glass bottles. The fencing and tires are roughly aligned in an east-west linear formation. The function of the pit is unknown.

HF-4 consists of a 91-cm wide and 3.66-m long alignment of large cobbles 13.7 m northwest of the San Solomon Low Canal (Figure 8). The southernmost end is stacked several courses high and resembles a historic cairn similar to those used to support a fence post.



Figure 7. HF-3 overview.



Figure 8. HF-4 overview.



Figure 9. PHF-1 overview.

Prehistoric Features (PHF)

Five prehistoric features were recorded within site 41RV157 (Table 1). PHF-1 consists of at least several hundred thermally altered igneous rocks scattered within a 20 m x 20 m area near the southern end of the site (Figure 9). Concentrations within the scatter suggest the feature is likely the remnant of multiple hearths. Associated artifacts include several chert flakes. PHF-2 consists of a diffuse scatter of approximately 50 thermally altered igneous rocks scattered within a 5 m x 5 m area 50 m north of PHF-1 (Figure 10). Associated artifacts include several chert flakes. PHF-3 consists of a scatter of approximately 25 thermally altered igneous rocks concentrated within a 1 m² area near

the center of the site (Figure 11). Artifacts in the vicinity include chert flakes and two Hueco/Carlsbad projectile points. PHF-4 consists of a scatter of approximately 25 thermally altered igneous rocks concentrated within a 1 m² area 5 m to the west of PHF-3 (Figure 12). Potentially associated artifacts include chert flakes and two Hueco/Carlsbad projectile points. PHF-5 consists of a scatter of approximately 30 thermally altered igneous rocks concentrated within a 1 m² area 25 m northwest of PHF-1 (Figure 13). No artifacts were recorded in the immediate proximity of the feature. No charcoal or carbon staining was observed in any of the features.

Table 1. Prehistoric Features within Site 41RV157. Note that no carbon was encountered with any of the features.

Feature	Type	Dimensions (m)	FCR Count	Potentially Associated Artifacts
1	Hearth	20 x 20	250+	Flakes
2	Hearth	5 x 5	50	Flakes
3	Hearth	1 x 1	25	Flakes/Projectile Points
4	Hearth	1 x 1	25	Flakes/Projectile Points
5	Hearth	1 x 1	30	-



Figure 10. PHF-2 overview.



Figure 11. PHF-3 overview.



Figure 12. PHF-4 overview.



Figure 13. PHF-5 overview.

Prehistoric Artifact Assemblage

At a minimum, the prehistoric assemblage includes several hundred pieces of lithic debitage, nine projectile points, seven biface fragments, seven pieces of groundstone, one core, one scraper, and one modified flake. The majority of the projectile point assemblage falls within the range of the Late Archaic Hueco/Carlsbad styles, with several showing slightly concave lateral margins

reminiscent of Livermore arrow points (Figure 14). Of the remaining points, one is a medial fragment of an unidentifiable style, one is a distal fragment possibly from a Charcos point, and the third is reminiscent of an Early Archaic Baker or Gower. All of the points are manufactured from chert.

Subsurface Testing

Shovel tests excavated within the site revealed a relatively uniform stratigraphy

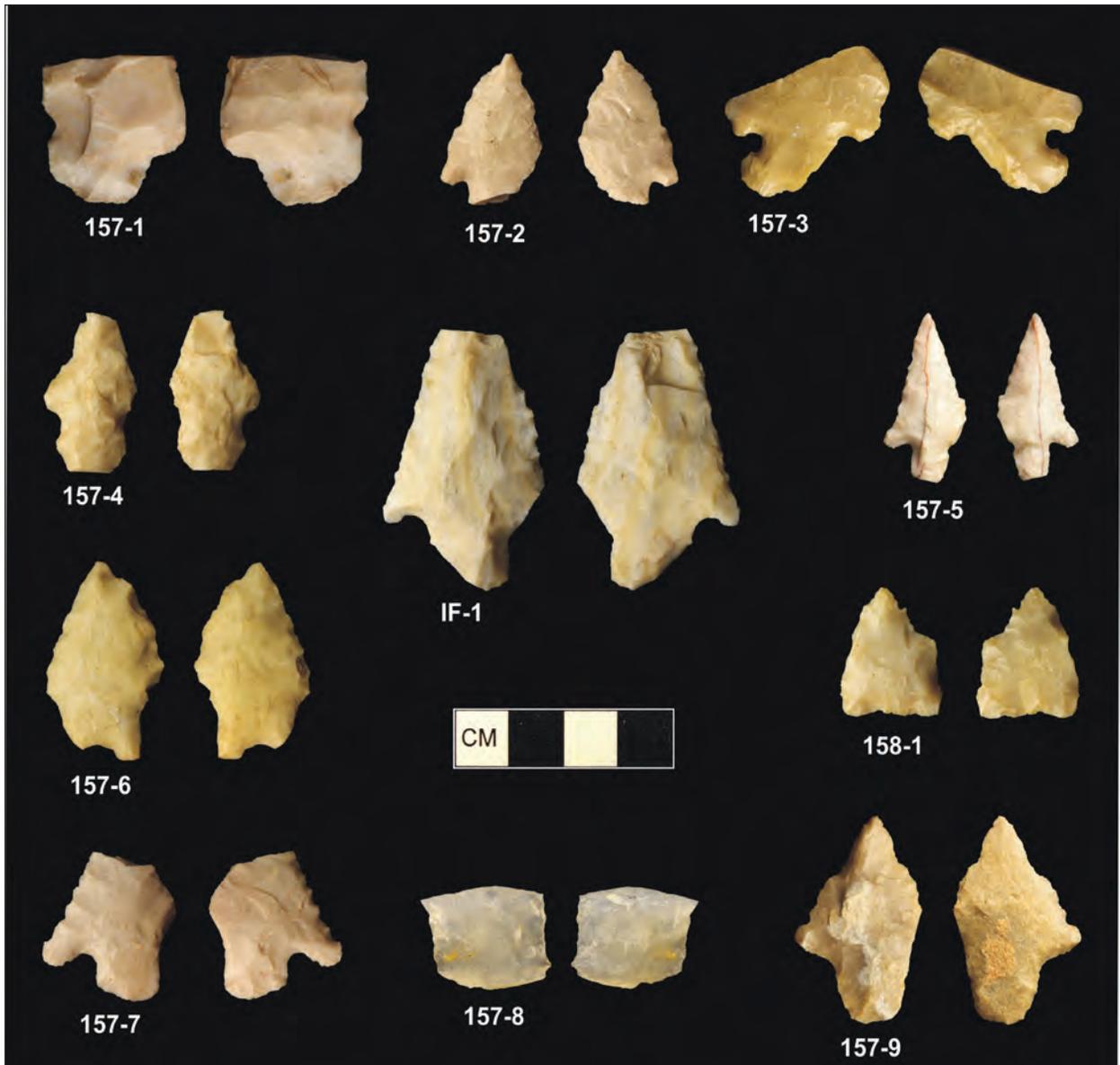


Figure 14. Projectile points collected during the survey.

consisting of compact brown clay overlain with a transitional zone of compact clay peds and loose, silty loam with varying amounts of igneous gravels. In general, gravels are more frequent in the northern half of the site, roughly consistent with the mapped distribution of the Limpia-Mitre association (NRCS 2018). In total, 18 flakes were recovered within ST-1 and ST-2 from 0-20 cmbs (Table 2). These were all composed of

non-cortical chert and measured 2.5 cm or less along their maximum dimension.

41RV158

Site 41RV158 consists of four early to mid-twentieth century trash dumps, a linear rock alignment, and a diffuse scatter of lithic debitage, fire-cracked rock, and groundstone within the southeast quarter of the project area. Soils within the site are mapped as

Table 2. Shovel Tests Excavated within Site 41RV157.

Stratum	Munsell	Soil	Gravel (%)	ST-1	ST-2	ST-3	ST-4
I	10YR 5/4	Silt loam, loose	10-50	0-5 cm 3 flakes	0-5 cm 6 flakes	0-5 cm sterile	0-10 sterile
II	10YR 5/4-4/2	Silt loam, transitioning to compact brown peds	10-20	5-20 cm 7 flakes	5-20 cm 2 flakes	5-30 cm sterile	10-25 cm sterile
III	10YR 4/2	Clay, very compact	0	20+ cm sterile	20+ cm sterile	30+ cm sterile	25+ sterile

Verhalen clay, a calcareous clayey alluvium formed on basin floors and alluvial flats (NRCS 2018). Historic aerial imagery indicates the site has been cleared and possibly plowed for agricultural use in the past. More recently, feral hogs have disturbed portions of the site and upturned soils to the depth of the underlying Pleistocene clay (Figure 15). The floral community is dominated by mesquite (*Prosopis* sp.), catclaw (*Senegalia greggii*), and four wing saltbush (*Atriplex canescens*). Ground surface visibility was approximately 85% at the time the site was recorded.



Figure 15. Ground disturbance from feral hogs within site 41RV158.

Historic Features (HF)

HF-1 is concentrated within a 5 m x 5 m area near the southeast corner of the site (Figure 16). Ceramic artifacts (n=30+) include decalware, fiestaware, stoneware, transferware, and whiteware sherds. Glass artifacts include numerous bottle shards (n=50+), eight complete bottles, a pink Depression glass plate, a blue shard from a Vicks Vapor Rub jar, a white shard from a Ponds Cold Cream jar, and a blue bead (collected). Metal artifacts include oil cans, wire nails, two fireplace shovels, a car fender, a caster wheel, an enameled pail,



Figure 16. HF-1 overview.

and a stove pipe. Those bottles that could be identified in the field included a John H. Woodbury aftershave bottle, a Coca-Cola bottle manufactured in Monahans, Texas, a Kist soda bottle, a Stewart's bluing bottle, a Barton's Dyanshine shoe polish bottle produced by Hazel Atlas between 1920 and 1964 (Toulouse 1971:239), and an aspirin bottle made by Owens Illinois between 1929 and 1954 (Toulouse 1971:403).

HF-2 is situated 160 m northwest of HF-1 and measures approximately 4 m x 4 m in area (Figure 17). The feature has been recently disturbed by hogs. Ceramic artifacts (n=25+) include whiteware and decalware sherds, and whiteware sherds with a hand-painted brown leaf design. Glass artifacts include shards of clear, amber, blue, and milk glass (n=25+) and nine complete bottles. Metal artifacts include sanitary cans (n=10+), lantern fragments (n=5+), enamelware fragments (n=5+), wire nails (n=5+), crown caps (n=5+), a mop head, a bolt, a barrel hoop, a fuse, and a pendent (collected). The pendent is circular and encloses the name "Joe." Construction materials include brick and tile fragment (n=10+). Bottles and shards with datable maker's marks include

two clear bottles manufactured by Hazel Atlas between 1920 and 1964 (Toulouse 1971:239), two clear ketchup bottles produced by Owens Illinois from 1929 to 1954 (Toulouse 1971:403), a post-prohibition clear pint bottle, and the base of a John Bull eye cup, (collected), patented on August 14, 1917 (Nussbaum 1917).

HF-3 is situated 80 m to the east of HF-2 and measures approximately 4 m x 4 m in area (Figure 18). Glass artifacts include numerous shards (n=50+) of clear, blue, jadeite, milk glass, four complete beverage bottles, a clear jar, a solarized pitcher, and an amber bleach bottle. The jar was manufactured by Owens Illinois between 1929 and 1954 (Toulouse 1971:403). A clear bottle manufactured by the Knox Bottle Company between 1932 and 1953 was the only bottle with identifiable maker's marks (Toulouse 1971:271). The ceramic assemblage (n=50+) includes numerous whiteware and stoneware sherds. Metal artifacts include sanitary, milk, kerosene, and tobacco cans (n=20+), enamelware pails (n=4), car parts (hubcap, fender, and license plate), a clamp, a chain, a spoon, chicken wire, and pipe fragments. The license plate reads "797-807" with "FRONT" on the left side and "TEX28" on the



Figure 17.PHF-2 overview.



Figure 18.HF-3 overview.

right. The plate is most likely from a Model T produced between 1908-1927 or an early Model A introduced in 1928.

HF-4 is situated 36 m north of HF-3 and consists of a small, 2 m x 2 m concentration of trash (Figure 19). Artifacts include sanitary cans (n=6+), clear and aqua bottle glass (n=20+), whiteware sherds (n=10+), metal fragments (n=20+), and a fragment from a ceramic figurine or doll.

HF-5 is located approximately 20 m northwest of HF-1 and consists of a broken, linear alignment of cobbles with no associated artifacts (Figure 20). The most intact portion measures approximately 2-m wide and 4-m long. Given that the area has likely been farmed in the past and other linear features are visible in aerial images of the region, these were interpreted as historic windrows left from land clearing or agricultural activities.

An isolated .50 caliber cartridge was also recorded and collected from the southeast corner of the site. The cartridge is a Benet-primed .50-70 Government round that was probably produced by the Frankford Arsenal between 1868 and 1873 (Barnes 2006). The



Figure 19. HF-4 overview.



Figure 20. HF-5 overview.

U.S. Army used this caliber until replacing it with the .45-70 in 1873 and sold many of the surplus .50-70 rounds to buffalo hunters.

Prehistoric Artifact Assemblage

At a minimum, the prehistoric assemblage within site 41RV158 includes 50 pieces of lithic debitage, 25 pieces of FCR, four modified flakes, two pieces of groundstone (collected), two cores, a biface fragment, and the base of a Late Archaic Hueco/Carlsbad projectile point (see Figure 14). The assemblage is widely scattered with no discernible spatial patterns to indicate different occupations or activity areas. Given the shallowness of the Holocene deposits, and previous disruptions from agricultural activities and animals, the site is unlikely to contain buried cultural materials in a primary context.

Shovel Testing

Those portions of the site impacted by hogs were inspected for cultural materials and none were found. One shovel test was excavated in the western portion of the site where disturbances were less frequent. The soil profile included 10 cm of loose, yellowish-brown (10YR 5/4) silty loam followed by 25 cm of loose silty loam intermixed with dense, dark grayish-brown (10YR 4/2) peds.

These transitioned into a very compact clay B horizon of the same color. No cultural materials were recovered.

CONCLUSION

In 2018, TPWD acquired approximately 70 ac of rangeland for potential expansion of Balmorhea State Park in Reeves County, Texas. TPWD archeologists surveyed the parcel using the TRU method and recorded two multi-component archeological sites. Site 41RV157 contains multiple prehistoric and historic features, a widespread artifact scatter, and early-to mid-twentieth century structural remains. Site 41RV158 consists of early-to mid-twentieth century trash dumps and a diffuse prehistoric artifact scatter. The following management recommendations are based on the results of this survey.

Site 41RV157 is recommended for official designation as a SAL under Criteria 1 and 2. Only one other site (41RV22) has been recorded in the vicinity of San Solomon Springs and further study of 41RV157 would contribute to an improved understanding of the history and prehistory of this region of Texas. Further, the preservation of intact subsurface deposits supplements the research potential of the site. Given these qualities, the site is also recommended eligible for inclusion on the NRHP under Criterion D: the site has potential to yield information important to both prehistory and history.

Although eligible, site 41RV158 is not recommended for official designation as a SAL. The prehistoric component of the site has been disturbed by historic land clearing and bioturbation, is diffusely distributed with no discernible features or spatial patterning, and has no indication of significant subsurface deposits. Further study of the historic component of the site would be unlikely to

yield information significantly different from what has already been collected. Given these qualities, the site is not recommended eligible for inclusion on the NRHP.

TPWD does not currently have plans to develop the 70 ac parcel. However, the policy of TPWD is to avoid impacting any archeological site, regardless of eligibility for designation as a SAL or for inclusion in the NRHP, and periodic monitoring of both sites is recommended. In the event the parcel is needed for future park infrastructure, TPWD will consult with THC during the planning process.

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ARCHEOLOGICAL SURVEY FOR THE TALALA TRAIL PROJECT, CEDAR HILL STATE PARK, DALLAS COUNTY

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ABSTRACT

Texas Parks and Wildlife Department staff conducted cultural resources investigations for a trail restoration project at Cedar Hill State Park in Dallas County. The trail will impact 0.4 ha (1 ac) and occurs primarily atop two landforms that were subject to archeological survey and augmented by the excavation of shovel tests. No known sites occur within the project area, and no previously unrecorded sites were encountered during the survey. As no significant cultural deposits or features occur within the project area, no further cultural resources investigations were recommended. Texas Department of Transportation concurred with these recommendations on 10 October 2018.

INTRODUCTION

In February 2016 and January 2018, Texas Parks and Wildlife Department (TPWD) Cultural Resources Program Staff conducted cultural resources investigations for portions of Cedar Hill State Park in Dallas County (Figure 1). The study concerns the reestablishment of the pedestrian Talala Trail that was obliterated by historic flood events in 2015 and 2016. The project will occur on land owned by the US Army Corps of Engineers (USACE) and managed by TPWD under lease. The project will be at least partially funded with Federal Highway Administration (FHWA) dollars via their Recreational Trails Program and administered by TPWD via Texas Department of Transportation (TxDOT). Per a programmatic agreement among FHWA, TxDOT, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation, TxDOT archeologists conduct project review under Section 106 of the National Historic Preservation Act in lieu of consultation with SHPO.

The Talala Trail is located in the central portion of the park in an area between two existing camping loops and was put into service at the park opening in 1991. While early park master planning documents do not specify, it is inferred the trail's namesake is from the Cherokee word for red-headed woodpecker (Joyner and Whitlock 2018:98). Historic flooding in 2015 effectively obliterated the majority of the trail and related improvements, and the trail has been closed since that time. The purpose of the current project, then, is to reestablish the trail in the same general area as the initial trail for park visitor use. Current, sustainable trailbuilding standards will be employed to prevent future erosion, though, and the original footprint will not be followed.

Development will consist of roughly 4 km of trail, and, with a natural surface tread width of 1 m, will cover 0.4 ha (Figure 2). Installation of cedar check steps will be necessary for safe access to an existing composting toilet just off the trail. Several

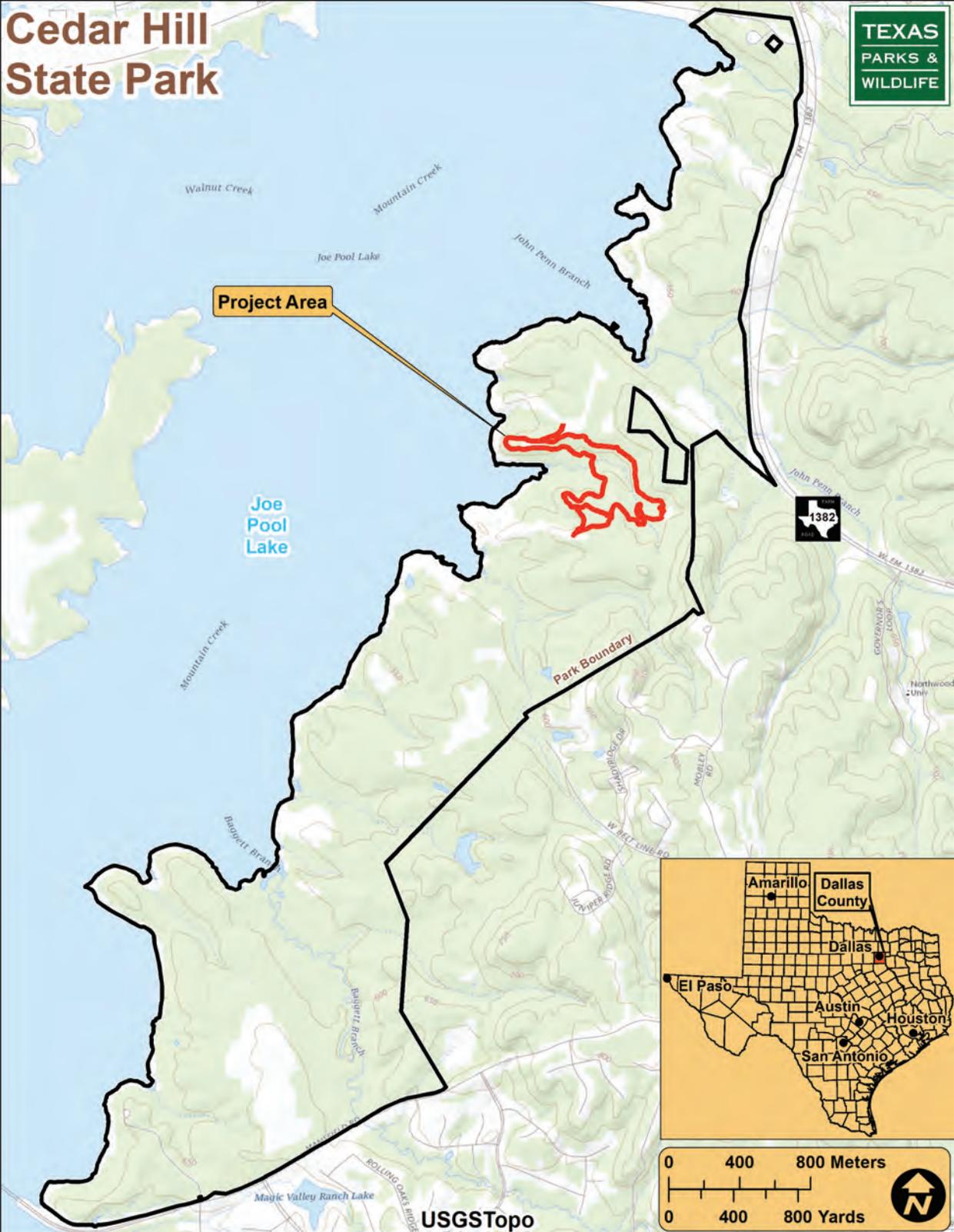


Figure 1. Topographic map depicting location of project in relation to park boundary.

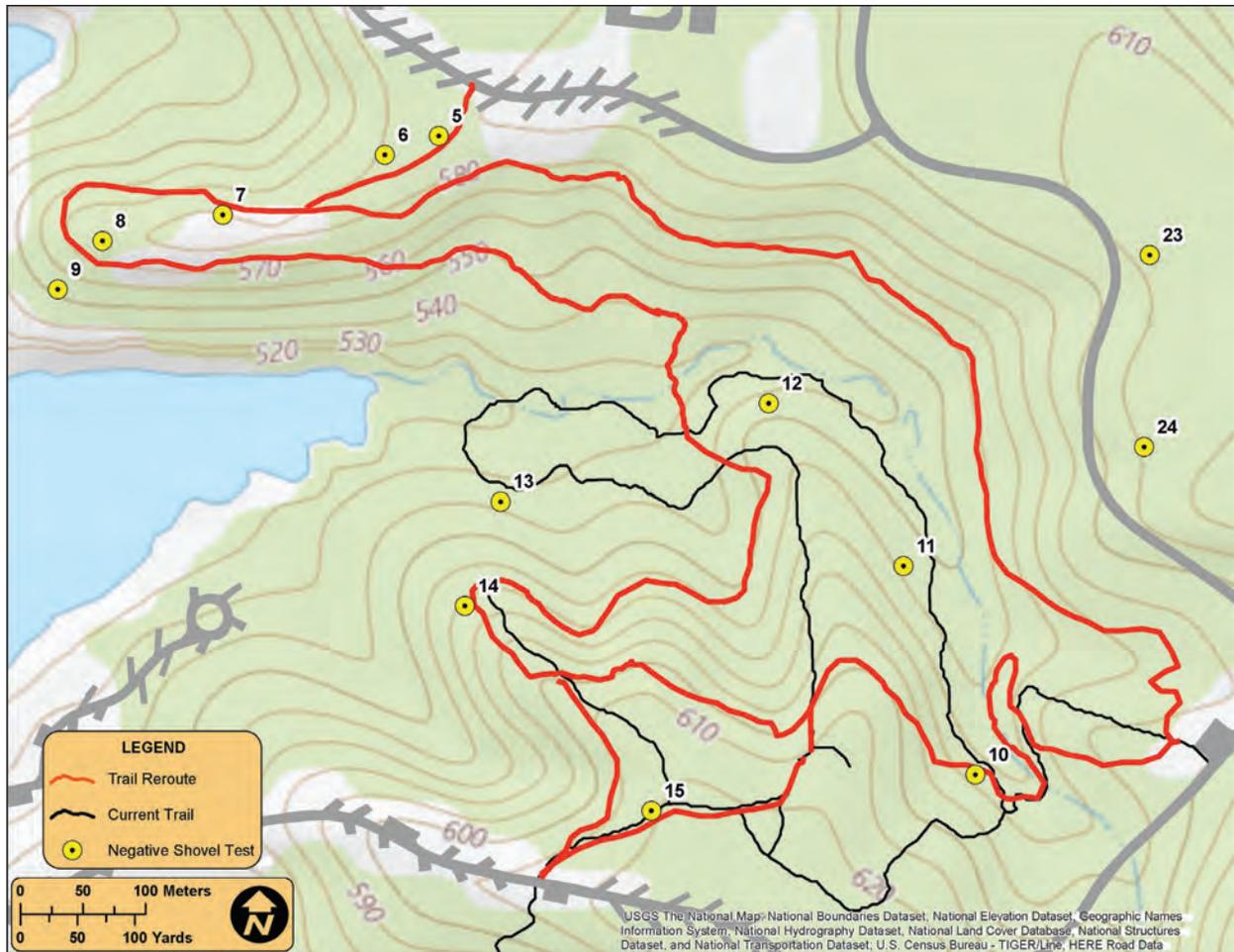


Figure 2. Topographic map depicting shovel tests in relation to the current trail alignment and the proposed trail reroute.

small pressure-treated lumber pedestrian bridges will be constructed, with support piers located outside of the upland drainage channels. The average depth of impact along the tread will not exceed 30 cm, but piers will impact up to 1 m below surface. Any damaged segments of the original trail that are encountered will be decommissioned and repaired with drainage and check structures to avoid continued erosion and promote revegetation. The project will be performed primarily with hand tools. No significant portion of the project will be conducted with heavy machinery, and no other work is associated with the project.

ENVIRONMENTAL BACKGROUND

The park occurs within the Blackland Prairie natural region of Texas, and the majority of the park consists of upland landforms dissected by steep, moderately incised drainages. The Upper Cretaceous Eagle Ford Group underlies the majority of the park, and the project area sits entirely atop this formation (McGowan et al. 1972). Soils within the project area consist of sloping to strongly sloping dense gray to olive clays (Coffee et al., 1980).

The clayey soils, mapped as Ferris-Heiden Complex, Heiden Clay, and Vertel Clay, originally supported tall grass prairies among

the uplands. Historic local agricultural practices utilized many of these prairies as livestock pastures. As early as 1938, extensive sheet erosion is evident across the uplands which likely removed much of the remaining topsoil. With slopes at or near 20%, row crops were unlikely, and the ridgetops would have been too narrow to be efficiently farmed. Currently, the surrounding area is undergoing prairie restoration efforts, and all woody vegetation has recently been removed. With grasses returning, the resultant surface visibility is about 20%.

The park is situated in the southwestern portion of Dallas County on the western edge of the City of Cedar Hill. A bit more than 1,900 ac in area, the park occurs along the eastern shoreline of Joe Pool Lake, which was impounded in 1986. There are springs within and immediately upslope of the park that intermittently feed upland drainages flowing westward across the park. Baggett Branch is currently the only perennial stream in the park, and John Penn Branch is the only other named stream in the park.

CULTURAL BACKGROUND

More than 500 archeological sites have been recorded in Dallas County over the previous 80 years. Some of the earliest documented investigations in the general vicinity were conducted by members of the Dallas Archeological Society in the 1930s (Harris 1936). Later, many of the county's sites were recorded as a result of energy or travel-related development projects, which occurred primarily during the previous 30 years. Notable among investigations within the county include work at prehistoric sites along Mountain Creek prior to the inundation of Joe Pool Lake (Peter and McGregor 1988) as well as recent data recovery operations at nearby Fish Creek Slough (Nickels 2014).

Notable historic investigations include work at several historic farmsteads in the Joe Pool Lake footprint prior to inundation (Jurney et al. 1988) and, more recently, intensive studies of the Freedman's Cemetery of northern Dallas (Peter et al. 2000).

Several professional archeological investigations have been conducted in the park proper over the previous five decades. Beginning in 1971, USACE prepared an environmental impact statement for the proposed Lakeview Lake, precursory name to Joe Pool Reservoir (USACE 1972). The statement notes that, while no professional surveys had previously occurred, one previously recorded site (41TR1) and at least six unrecorded sites were known to be within the future reservoir (USACE 1972: III 7). The statement recommended that the National Park Service assess the area, likely via cooperative agreement similar to prior reservoir survey partnerships with Texas Archeological Salvage Project.

An archeological assessment was finally arranged through the Archaeology Research Program at Southern Methodist University (SMU), with investigations conducted during 1977 and 1978 (Skinner and Connors 1979). Methodology employed across the roughly 20,000 ac project consisted of pedestrian surface survey; no subsurface testing was employed in site discovery (Skinner and Connors 1979:19). In addition to documenting 42 archeological sites, salient aspects of the report included (1) recommendations for additional significance testing for select sites; (2) determination of the limitations of surface survey in similar environments; and (3) the need for subsurface testing in areas planned for development or other impact.

Following the survey, significance testing was undertaken at select recommended sites (Raab 1982). Data recovery excavations

at five prehistoric sites was recommended to mitigate adverse impact from reservoir development. The sites (41DL148, 41DL149, 41DL184, 41DL189, and 41DL199) were all determined to possess good integrity and were able to address specific scientific questions related to local prehistory (Raab et al. 1982:96). In addition, further work at 11 historic sites was recommended, with level of efforts ranging from architectural documentation to intensive testing and data recovery excavation (Ferring and Reese 1982:232-233).

Data recovery efforts for the sites determined significant in the earlier studies were conducted during the late 1980s (Peter and McGregor 1988; Journey et al. 1988). The six prehistoric sites excavated revealed only a limited occupation and use of the floodplain and surrounding uplands. Two of the prehistoric sites exhibited unique subsistence patterns including a horticultural community and a small occupation based on bison procurement (Peter and McGregor 1988). Historic site investigations focused primarily on landowners' farmsteads; however, four tenant farmers' dwellings were also investigated. The historical investigations provided an important contribution to understanding agrarian economy in North Central Texas from the mid-1800s through the 1920s (Journey et al. 1988).

Concurrent with the SMU investigations and park master planning (TPWD 1983), TPWD conducted smaller, typically project-driven archeological assessments and surveys at various locations throughout the area that would become the park. Many of the earliest TPWD investigations occurred in the 1970s and 1980s and consisted of initial site assessments and for park planning efforts (Ralph 1996a, 1997a). As park development was underway, additional TPWD investigations occurred in response

to utility projects (e.g., Ralph 1996b) and exploration of amenity developments such as trails (e.g., Ralph 1997b).

Since park opening in 1991, over 100 projects have been coordinated through the TPWD Cultural Resources Program to ensure continued protection of the cultural resources at the park. The scope of these projects varied considerably, with many focused on maintenance, alteration, or repair of existing amenities such as addressing the ever-present threat of erosion (e.g., Buysse and Hunt 1999). Utility line installation and upgrades comprise some of the more extensive impacts, with one right-of-way extending the entire long axis of the park (Skinner and Todd 2007). While additional sites have been recorded in the park, all but one site (41DL488) has been determined ineligible for inclusion on the National Register of Historic Places (NRHP).

In total, there are five sites within 1 km of the current project area. All of these sites are historic farmsteads, as the potential for prehistoric sites in these environmental settings has proven to be quite low (Peter and McGregor 1988). Site forms from the Texas Archeological Research Laboratory, the Texas Archeological Sites Atlas, and the TPWD cultural resources database were consulted to generate the below descriptions.

41DL182

The Teodviski House site was originally recorded as a historic farmstead during the early SMU surveys (Lynott 1977). At that time, the farmhouse was still standing and was described as a three-room house with a porch, beige shiplap siding, enclosed soffit, and a shake roof. The house was not occupied at the time, and it was then being used to store hay and other farm items. Subsequent excavations at the site revealed

a lack of significant cultural deposits in good context, and the site was not recommended as eligible for listing on the NRHP (Raab 1982:176).

41DL192

Penn Farm was originally recorded as an archeological site during the early SMU surveys (Lynott 1978). The farm was established by the Penns in the 1850s and served as a working farm to the same family through the 1970s. At the time it was initially recorded, it was described in excellent condition with numerous intact structures. The site was subsequently determined eligible for listing on the NRHP (Lebo 1985).

41DL288

This site was originally recorded during later SMU survey work (Jurney 1989a). Interestingly, the site was described as a nineteenth century farmstead; however, no artifacts or features were encountered during the fieldwork. It is possible the researcher combined the structures associated with 41DL182 and 41DL288, both north of a side road off of old Belt Line Road, and assumed a second site south of the road. In any event, the structures that were later correctly assigned to 41DL288 include a concrete trough, concrete windmill pad, fencelines, artifact scatters and dumps, and unidentified poured concrete features. The combination of archival research and artifact assemblage indicates the site is a late nineteenth century to mid-twentieth century tenant farmstead. The site has not been assessed for NRHP eligibility, and its status remains unknown.

41DL289

This historic farmstead was originally recorded during later SMU survey work (Jurney 1989b). During time of survey, the house had been razed and burned, with

evidence of land clearing activities. Artifacts included glass, ceramic, and metal, and features included dwelling and outbuilding ruins and concrete foundations. Extensive dumping was noted, and erosion was noted as an impact to the area. The site was estimated to retain only 25% of its deposits. Due to the level of disturbance and its relatively recent age, the site was determined ineligible for listing on the NRHP (W. H. Collins to F. L. Oaks, letter, 11 September 2003, 41DL289 Site File, Cultural Resources Program, TPWD).

41DL190

This historic farmstead was originally recorded during later SMU survey work (Jurney 1989c). The house, presumed to be a tenant farmstead, first occurs on published maps in 1920, and the house and barn are clearly visible on historic aerial imagery from 1938. Cultural features encountered included foundations, outbuilding ruins, a well, and modern trash dumps. Artifacts encountered include glass, metal, and ceramics, and suggest an occupation during the mid-twentieth century. Erosion was noted on site, and it was estimated that 60% of the cultural deposits remain intact. No excavations have occurred, and the NRHP status of the site remains unknown.

METHODS

Prior to initiation of the field investigations, a comprehensive review of all available archeological reports and databases was conducted to identify and characterize cultural resources known to occur in the vicinity of the project areas. At least in part, the compilation of known cultural resources is based on the Texas Archeological Sites Atlas, Texas Historic Sites Atlas, and Texas Historical Commission (THC) and TPWD map files. In addition, the literature and archival

review inspected historic U.S. Geological Survey topographic maps and Natural Resources Conservation Service soil surveys (Coffee et al. 1980).

Per current THC survey standards for linear projects, shovel test density is 16 per mile, or one shovel test every linear 100 m. For projects that occur on level or nearly level terrain, the current project would have necessitated about 40 shovel tests. Due to the severity of the slopes throughout the immediate area, though, that density is not applicable to the current project. Specifically, as the slopes of the dissected upland ridges were deemed to meet or exceed 20%, shovel testing density was adjusted accordingly.

The fieldwork consisted of a 100% pedestrian survey of the project area augmented by the excavation of shovel tests. A single transect was deemed adequate to assess the 1-m wide linear project area. As the majority of the proposed trail tread is proposed along the midslope of steep upland landforms (see Figure 2), shovel testing was focused on more level ridgetops where potential for intact cultural deposits was greatest. Shovel tests were roughly 30 cm in diameter, and were excavated in levels not exceeding 20 cm in thickness. Sediments from these tests were screened through ¼" hardware cloth. Each shovel test was excavated to a sterile clay substrate or a maximum depth of 1 m below ground surface. All shovel tests were mapped with a GPS unit and added to the park's geodatabase.

RESULTS

A total of 4 km was subject to archeological survey at the park (see Figure 2). The purpose of the survey was to ensure that potentially significant cultural deposits or features would not be adversely impacted as a result of proposed trail relocation. The

fieldwork consisted of a 100% pedestrian survey augmented by the excavation of 11 shovel tests.

Background research indicated that there was no historic development across the majority of the project area. The one exception occurs in the extreme northwestern portion where the trail is situated atop and along an old two-track road. The road follows a finger ridge out into the floodplain of Mountain Creek and appears to have served as a drive that once connected the Penn Farm (41DL192) with Old Belt Line Road.

An apparent activity area is visible in historic aerial imagery and is depicted in Figure 3. Survey reveals a disturbed area measuring roughly 40-m long and 20-m wide. The area is hummocky, with several push piles and shallow pits that continue to hold water. Based on the content of dense clays visible in the piles and pits, it is possible that this served as a small clay quarry. Given the small size of the disturbed area and the lack of formal designation on any historic maps, the operation was either very short-lived or was a private source serving a farmstead. Two shovel tests in the vicinity of the disturbed area failed to encounter any cultural deposits, but a dilapidated fenceline was encountered paralleling the road. The fence consists of cedar posts, woven wire for the lower portion, and three strands of barbed wire for the upper. Fasteners include fence staples and wire nails.

Without exception, all of the shovel tests for the project encountered the underlying parent material. This basal material consists of a yellowish-brown or olive, slightly silty clay that is extremely dense. The clay varies from moderately moist to very wet, and calcium carbonate nodules were encountered in most instances. The nodules range in size from very small (2-3 mm \varnothing) to much larger

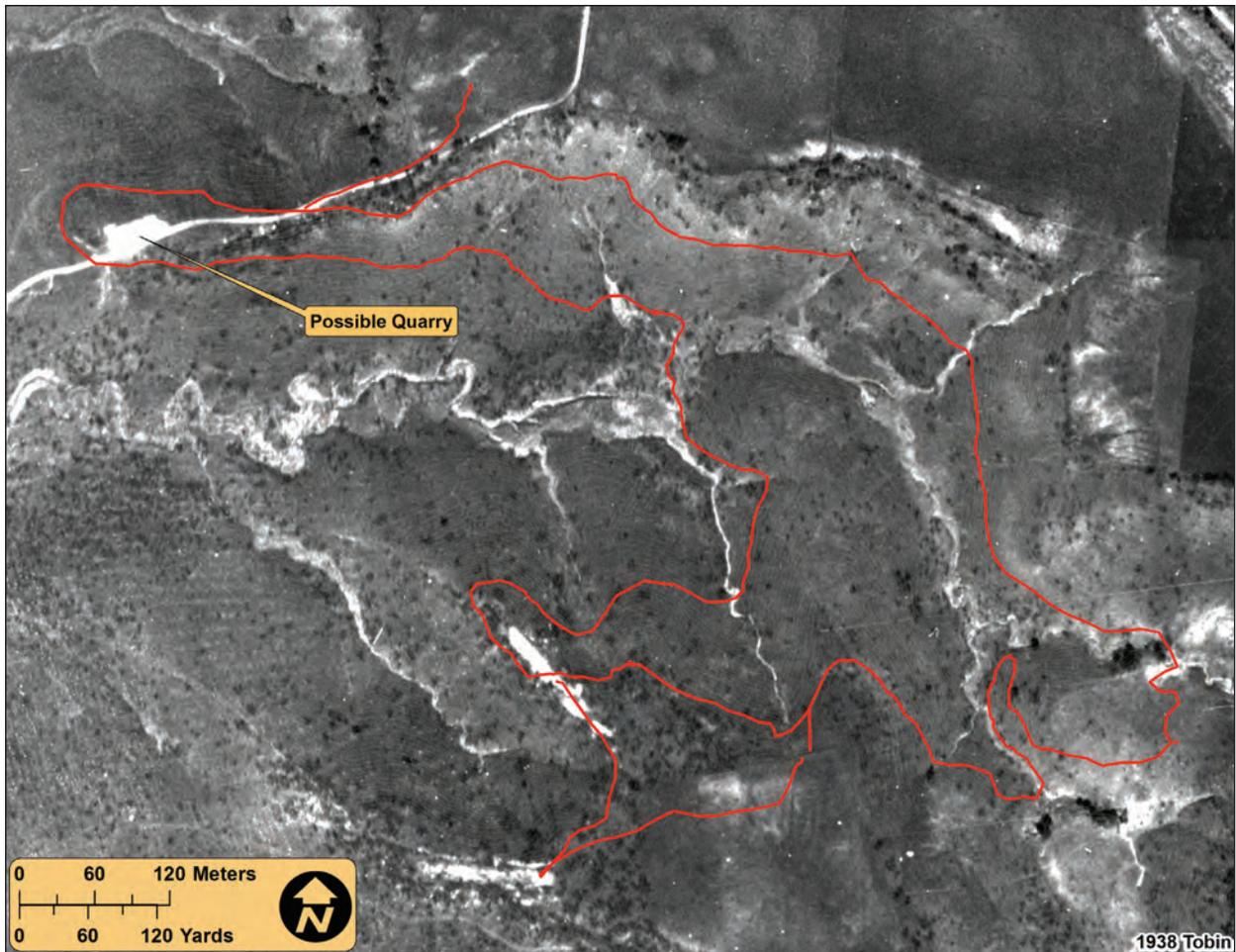


Figure 3. Historic aerial imagery depicting linear project area (in red) in relation to a possible clay quarry (Copyright P2ES; used by permission).

(2+ cm ϕ), with the larger examples occurring immediately above exfoliated limestone. In some areas, the underlying clay is expressed surficially, which was the case at four of the selected shovel test locations.

The remaining seven shovel tests all encountered a surface layer (A horizon) overlying the clay that varied between 10 and 20-cm thick, with a average thickness of 15 cm. This surface layer consists of a brown to dark brown clay loam and is generally moist. Abundant roots exist along with varying amounts of organic material and sparse to moderate terrestrial snail shell. None of the

mapped soils within the project area possess a humus layer similar to this clay loam; however, the Heiden series is described as exhibiting a plowed or otherwise modified surface layer (Ap horizon) extending 15 cm below ground surface (Coffee et al. 1980:61).

Penn Farm (41DL192) is the nearest recorded archeological site to the project area and occurs about 200 m away from the northernmost portion of the proposed trail. The site, an operating farm from the 1850s through the 1970s, occupies 7 ha (17 ac) and is separated from the project area by a camping loop and a parking lot. The

farm was first recorded as an archeological site during early SMU surveys (Lynott 1978) and was later nominated to the NRHP (Lebo 1985). The site will not be impacted by trail development or any associated activities.

Background research and field investigations failed to identify any significant cultural deposits or features within the project area. The two-track road and associated clay quarry are deemed to be of minimal significance beyond their locational data. Given the steep topography and clayey surface soils, these dissected uplands have proven to be low probability for the encounter of prehistoric sites and, aside from upland ridges, for encounter of historic features.

CONCLUSION

The current investigations were undertaken prior to initiation of a trail reestablishment project. Background research indicted the low potential for the encounter of cultural deposits or features, and no substantial historic development was indicated through this research. Intensive fieldwork within and surrounding the proposed trail footprint has demonstrated that no significant cultural resources are likely to be impacted by development. In short, no unrecorded archeological sites were encountered, and no previously recorded sites occur within the proposed project area. The TPWD Cultural Resources Program therefore recommended that the proposed project be allowed to proceed without further cultural resources investigations. USACE reviewed this report, and concurrence with TPWD recommendations was received from USACE on 16 January 2018. TxDOT reviewed the project and concurred with TPWD recommendations on 10 October 2018.

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INTENSIVE CULTURAL RESOURCES SURVEY OF TWO PROPOSED NEW RESIDENCES, CHAPARRAL WILDLIFE MANAGEMENT AREA DIMMIT COUNTY

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ABSTRACT

Texas Parks and Wildlife Department plans to use state and federal funds to construct two new residential buildings at the Chaparral Wildlife Management Area in Dimmit County. The existing buildings in the residential complex do not support staff needs. The proposed impacts include clearing vegetation with a bulldozer, grading/excavating a footprint for the foundation slab, excavating an area for the sewage tank, trenching for buried utility lines, and landscaping. A roughly one acre area was surveyed for each of the residences, to allow for flexibility in placement of the utilities and driveway. The project depths of impact will range 15-30 cm for the foundation pads, 60-90 cm for the waterlines, and approximately 1.8 m for a buried sewage tank. Landscaping impacts would be minimal and within the range of previous ground disturbances. An intensive pedestrian survey was conducted on 14 June 2018. This included the excavation of six shovel tests. No cultural resources were encountered during this survey.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) plans to construct two new residential buildings at the Chaparral Wildlife Management Area (WMA) in Dimmit County (Figure 1). The buildings will each be slab on grade, three bedrooms/two bathrooms, energy-efficient staff residences and will include new on-site sewage facility systems as well as associated site work and extension of utilities, landscaping, and driveways.

The proposed impacts include clearing vegetation with a bulldozer, grading/excavating a footprint for the foundation slab, excavating an area for the sewage tank, trenching for buried utility lines, and landscaping. A roughly one acre area was surveyed for each of the residences, to allow for flexibility in placement of the utilities and driveway (Figure 2). The project depths of impact will range 15-30 cm for

the foundation pads, 60-90 cm for the waterlines, and approximately 1.8 m for a buried sewage tank. Landscaping impacts would be minimal and within the range of previous ground disturbances.

A cultural resources background review of the project area revealed that it has not been previously surveyed, and no previously recorded archeological sites are present. A review of the soils, geology, and hydrology of the area determined that the project area does not contain deep sandy alluvial sediments. The project area has low potential for buried cultural resources, but a small surficial lithic scatter was recorded in the vicinity, indicating some potential for cultural resources in disturbed settings. As the project includes federal funding, an intensive pedestrian survey was required in accordance with Section 106 of the National Historic Preservation Act.

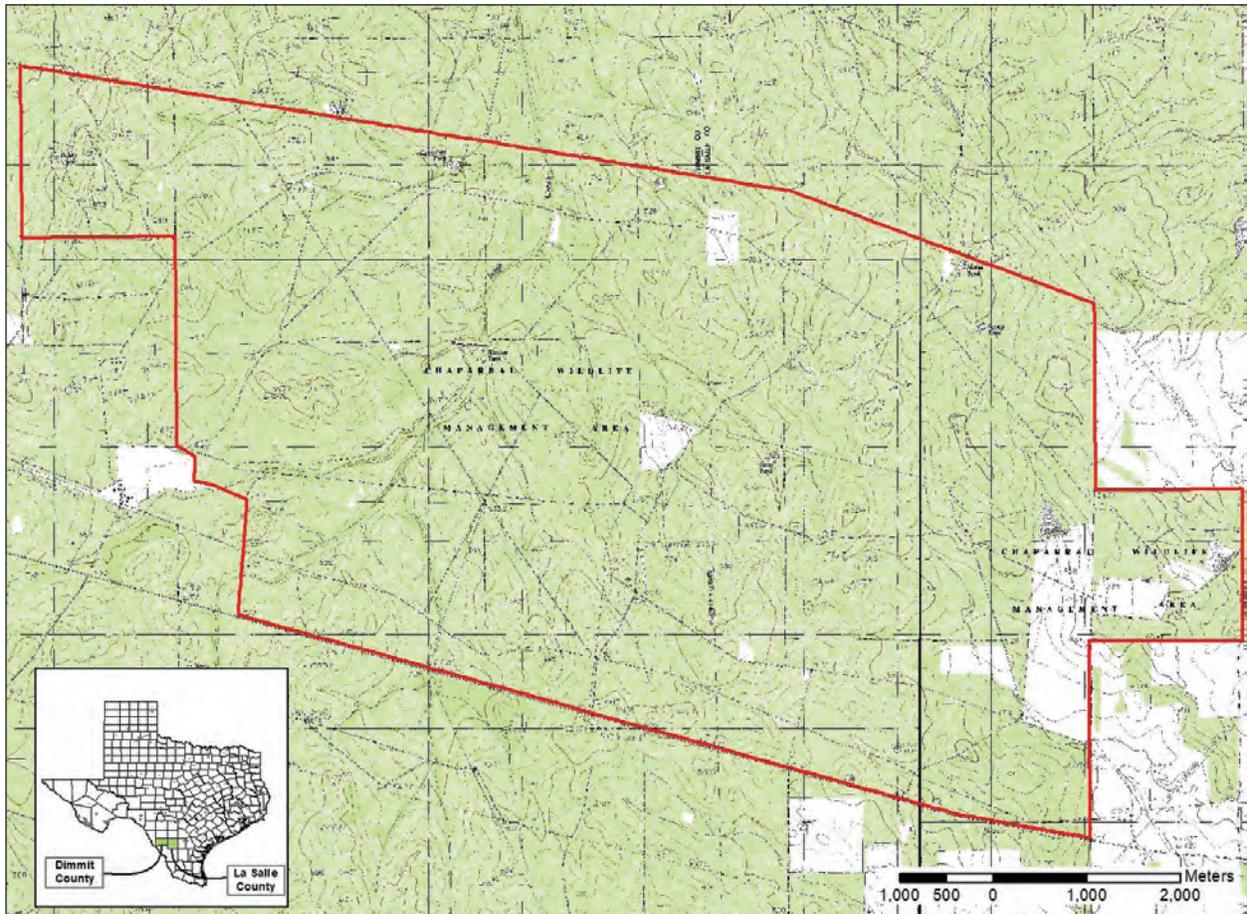


Figure 1. Topographic map showing Chaparral Wildlife Management Area.

ENVIRONMENTAL BACKGROUND

The general region of the WMA belongs to the west Gulf Coastal Plain physiographic area (Bureau of Reclamation [BoR] 1975: B-21). The bedrock geology in this area consists of parallel bands (oriented southwest to northeast) of Tertiary period rocks representing outwash sediments of a retreating sea shoreline that parallels the modern coast of the Gulf of Mexico. In the Choke Canyon Reservoir area, the rocks were deposited during the Eocene epoch.

Vegetation at the WMA, which is situated in the Tamaulipan Thornscrub vegetation habitat, is characterized by xeric thornscrub. Prior to European and Euro-American

settlement of the region, the land may have been grass-covered, but historic overgrazing, well-water irrigation, and climatic changes have replaced the ground cover in most areas with thornscrub brush (Hester 2004:127). The region is dominated by mesquite and various acacias, including catclaw, huisache, and black brush. Prickly pear cactus is common and often dense. Other dominant trees include post oak and live oak. The understory consists of numerous kinds of grasses. The lands that are now the WMA were subjected to brush clearing historically, with particularly heavy chaining in the southern part (Hodge 2000:233-234). A major wildfire burned over the area in 2008.

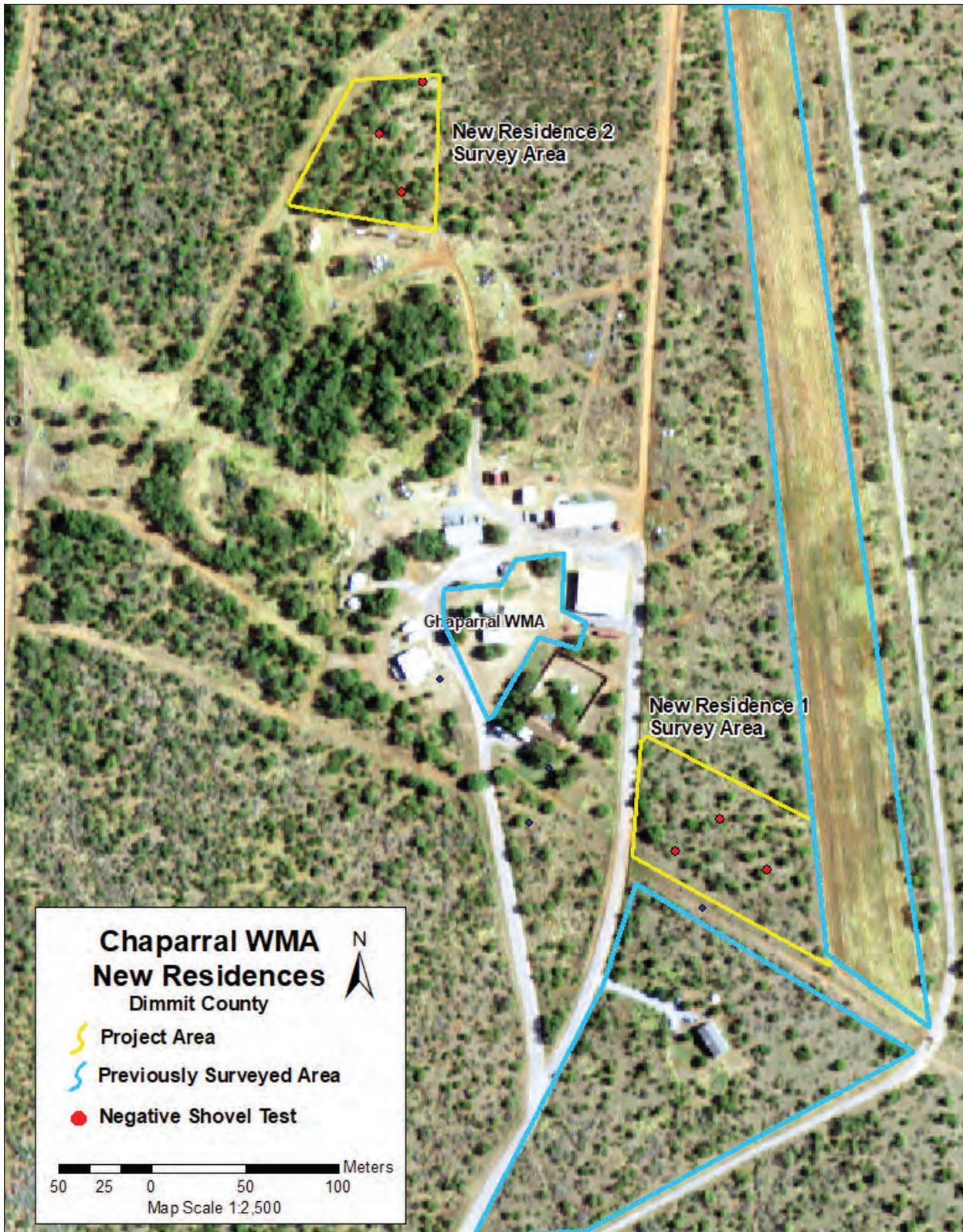


Figure 2. Aerial imagery showing the current project area and shovel test results in relation to previously surveyed areas.

According to the U.S. Geological Survey (USGS) Texas Geology Map Viewer, the project area is mapped as the Laredo Formation dating to the Eocene epoch of the Tertiary period, roughly 56 to 34 million years ago (USGS 2018). These are mixed sandstone and clay, with thick red and brown sandstone layers at the top.

Project area soils are mapped as Dilley fine sandy loam, gently undulating (Natural Resources Conservation Service 2018). This is loamy residuum weathered from sandstone, formed on interfluves. The representative profile is two layers of fine sandy loam at 0-12 cm and 12-40 cm overlying bedrock at 40-90 cm.

CULTURAL BACKGROUND

The cultural region where the WMA is located is alternately referred to as the Rio Grande Plain, the Nueces Plain, or the South Texas Plains (Hester 2004:127); this report will use South Texas Plains. This region is west and upstream of the Gulf Coastal Plain, and south of the chert-rich Edwards Plateau. As mentioned above, many of the rivers that drain the northern portion of the South Texas Plains either have their source in, or flow across, the Edwards Plateau. The WMA is at least 8 km south of the Nueces River, within a vast dry area extending to the Rio Grande Valley. Many researchers have attempted to divide the South Texas Plains into subregions due to the varied settings (Hester 2004:127).

The large amount of archeological work done in advance of the construction of Choke Canyon Reservoir (BoR 1975; Lynn et al. 1977; Hall et al. 1982; Fox and Ward 1986, among others) has helped to define, and refine, the archeological sequence for South Texas. The prehistoric cultural sequence is generally divided into three main periods: Paleoindian, ca. 11,250-8,850 years before

present (BP); Archaic, ca. 8,850-1,300 BP; and Late Prehistoric, 1,300-250 BP, with subperiods delineated within each major period, reflecting distinctive archeological patterns (Hester 2004). Note that Hester (2004:150-151) also discusses using the term Protohistoric for the period from roughly 500-250 BP, when indirect impacts from European contact, and some European goods, were present in the area without having significant direct contact or settlement. Much of the data on the prehistory of the South Texas region is discussed in Hester (2004). As no archeological sites were identified during this project, no further details are discussed in this report. Interested readers are encouraged to consult the references above for further information.

Previous Investigations

The Texas Historical Commission (THC) Archeological Sites Atlas shows no prior archeological surveys conducted in this specific part of the WMA. However, TPWD records indicate that numerous small surveys were conducted from 1988 to 1990 by TPWD staff archeologists under the direction of Principal Investigator Mike Davis (Turpin and Carpenter 1996). One of these surveys, for a proposed controlled burn on a dirt airstrip, was within or adjacent to one of the proposed residence areas and recorded a site within 100 m of the proposed Residence 1 location.

According to the site form, site 41DM81 consists of a “light” (low density) prehistoric lithic scatter in a 15 m² area; in the report the site size is listed as 3 m x 5 m (Turpin and Carpenter 1996). The form indicates that the archeologists collected every visible flake on the surface, and even though the number of specimens was not reported, the remains are described as interior (non-cortical) flakes, possibly from limited knapping activities.

In 2011, TPWD Archeologist Chris Lintz conducted a survey of 6.1 ac for a new residence and associated septic field (Lintz 2012). The survey area was roughly 100 m south of the proposed Residence 1 location. Some modern debris was noted on the surface. Two negative shovel tests were excavated, reaching depths of 50-70 cm below surface (cmbs; Lintz 2012).

In 2016, Lintz conducted a survey of a one acre area for a proposed bunkhouse demolition and replacement project in the main residential complex at the WMA (Lintz 2016). The small survey area is roughly 200 m northwest of the proposed Residence 1 location and 250 m south of the proposed Residence 2 location. One negative shovel test was excavated, terminating at red sandy clay at 30 cmbs (Lintz 2016).

METHODS

The author conducted an intensive pedestrian survey of the proposed project area. Shovel tests were excavated judgmentally, distributed across each small project area, and intended to meet the three shovel tests per acre standard that the THC has as a minimum for projects less than two acres in size.

Overall, six shovel tests were excavated during the survey (see Figure 2). Each test measured 35 x 35 cm and was dug in arbitrary levels based on soils to a depth of 100 cm or until encountering basal clay or impassably compact soils. All sediments were screened through ¼" mesh screen. Each shovel test was recorded on a log, noting the presence/absence of cultural materials, Munsell soil color, soil texture, and inclusions for each soil strata encountered. When cultural materials were encountered, the depth of the recovery, a count, and a simple description was noted on the form. Each shovel test location was

recorded using a Trimble GeoXT GPS unit. All shovel tests were backfilled following recording.

All sites, isolated finds, and features were documented using photographs, field notes, and a GPS point. Due to the amount of previous work in the area, a threshold for distinguishing a site from an isolated find was in use for this project. A density of two artifacts per square meter, with a minimum of 10 artifacts, was selected as the requirement for determining a site. The presence of burned rock, chipped stone tools or a variety of artifact types could also be a determining factor. Nondiagnostic isolated historic artifacts and prehistoric lithic debitage, following an examination of the ground surface in the vicinity, were noted but not documented. Temporally diagnostic artifacts, artifacts believed to be at risk of uncontrolled collection, and artifacts recovered from shovel tests were collected and curated in the TPWD Archeology Lab curatorial facility.

As stated above, the THC guidelines stipulate that for project areas less than two acres in area, three shovel tests should be excavated for every acre. For this project, six shovel tests were required, and the six shovel tests excavated during the current project met this standard.

RESULTS

The survey was conducted on the morning of 14 June 2018. The technically late spring weather was mostly sunny and unseasonably hot. Access to the survey areas was easy, due to the paved and dirt roads and moderately open wooded plains.

Vegetation varied only in density and was consistent with the thornscrub setting (Figure 3). Mesquite trees were ubiquitous, ranging from scrub to 4.5-m tall. Acacia



Figure 3. Typical thornscrub vegetation in Residence 2 area. View to east.

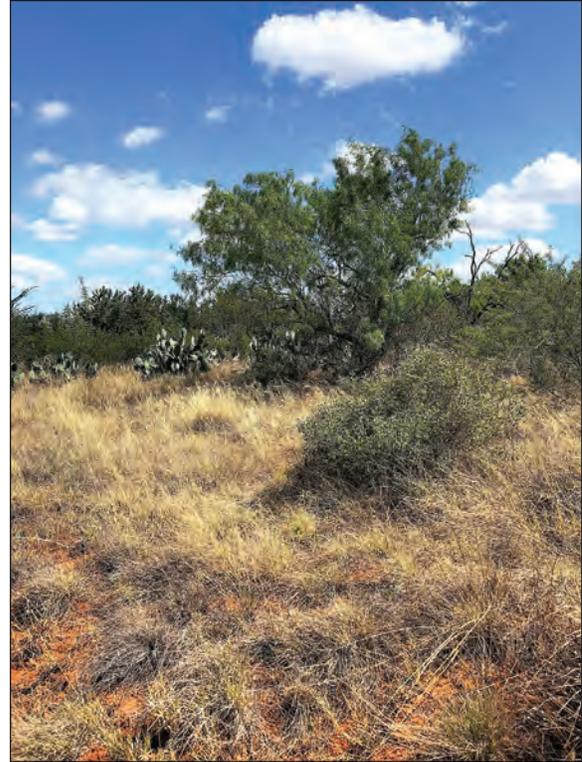


Figure 4. Vegetation in Residence 1 area. View to northwest.

scrub was also common. Prickly pear was sparse within the Residence 2 survey area, but common in the Residence 1 area (Figure 4). Grasses were present throughout, mainly in small bunches, and were very dry. Ground visibility was varied, but never less than 20%, and often greater than 60%.

As noted above, six shovel tests were excavated. Tests were excavated judgmentally, distributed across each small project area. All the tests were negative for cultural materials.

In general, the soils were quite dry and compact, reflecting both the general aridity of modern South Texas and ongoing drought conditions at the WMA. Results were relatively uniform, generally encountering 25-30 cm of strong brown (7.5YR 4/6) sandy loam overlying 10-15 cm of dark reddish

brown (5YR 3/4) compact sandy clay loam (Figure 5). Tests were terminated on reaching an impassably compact soil interpreted as basal clay, but which could be degrading bedrock. Shovel test results were consistent with the representative soil profile mapped in the project area. One exception was Test R2-2, in which the upper layer was only 15-cm thick, and the lower layer included large sandstone chunks and 10-15% gravels, terminating at a rocky layer interpreted as bedrock. Gravels were relatively sparse on the surface throughout most of the survey area, and sparse within shovel tests, generally less than 10 small gravels per layer.

No cultural materials were observed during the survey. Some clear glass bottles (Figure 6), clear glass jars and sanitary cans were observed within the southern extent of Residence Area 2, on the outskirts of a larger



Figure 5. Road cut showing typical soil profile. View to south.

dumping area. These were determined to be modern based on design and proximity to modern plastic refuse. No cultural resources were encountered during the survey.

CONCLUSION

TPWD plans to construct two new residential buildings at the Chaparral WMA in Dimmit County. The buildings will each be slab on grade, three bedrooms/two bathrooms, energy-efficient staff residences and will include new on-site sewage facility systems as well as associated site work and extension of utilities, landscaping, and driveways.

The proposed impacts include clearing vegetation with a bulldozer, grading/excavating a footprint for the foundation slab, excavating an area for the sewage tank, trenching for buried utility lines, and landscaping. A roughly one acre area was surveyed for each of the residences, to allow for flexibility in placement of the utilities and driveway (see Figure 2). The project depths of impact will range from 15-30 cm



Figure 6. Modern glass beverage bottle in dump outskirts, Residence 2 area.

for the foundation pads, 60-90 cm for the waterlines, and approximately 1.8 m for a buried sewage tank. Landscaping impacts would be minimal and within the range of previous ground disturbances.

A cultural resources background review of the project area revealed that it has not been previously surveyed, and no previously recorded archeological sites are present. A review of the soils, geology, and hydrology of the area determined that the project area does not contain deep sandy alluvial sediments. The project area has low potential for buried cultural resources, but a small surficial lithic scatter was recorded in the vicinity, indicating some potential for cultural resources in disturbed settings. As the project includes federal funding, an intensive pedestrian survey was required in accordance with Section 106 of the National Historic Preservation Act.

Six shovel tests were excavated during the survey. Shovel tests were excavated judgmentally, distributed across the project

area. All six tests were negative for cultural materials. The only cultural materials noted were modern refuse, including bottles, jars, and cans.

TPWD recommended, and THC concurred, that construction of the two new residences with associated utilities and driveways should have no adverse effect on the cultural resource base at the WMA. TPWD also recommended, and THC concurred, that if any cultural materials are encountered during the project then work should halt in the immediate area of the possible archeological site and a professional archeologist be called to document the nature of the unanticipated discovery. If the materials are determined to be of cultural origin more than 50 years old, then further consultation will be conducted with THC to ensure that the resources have been documented and impacts mitigated.

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ARCHEOLOGICAL SURVEY OF CIVILIAN CONSERVATION CORPS CAMP SP-53-T AT CLEBURNE STATE PARK, JOHNSON COUNTY

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ABSTRACT

Texas Parks and Wildlife Department archeologists conducted a pedestrian survey and mapping project of a previously recorded archeological site, 41JN19. The project area is located in Cleburne State Park, Johnson County, approximately 20 km southwest of Cleburne and 80 km south of Fort Worth. The survey of approximately 26 ac was conducted in March 2018 by members of the Cultural Resources Program. This project was initiated to collect accurate locational data on Civilian Conservation Corps encampment features, more accurately define the boundary of 41JN19 (containing the remains of the camp), assess the structural and archeological features, and evaluate the significance and eligibility of site 41JN19 for designation as a State Antiquities Landmark. This information will be used during the planning of an interpretative trail focusing on the camp history. A total of 17 features was recorded during this survey, 14 of which were determined to be directly associated with the historic camp including evidence of structural foundations and small-scale recreational features.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) archeologists conducted a survey of a portion of Cleburne State Park in March 2018 (Figure 1). The purpose of the survey was to record features associated with the Civilian Conservation Corps (CCC) camp located in the southern portion of the park near the park headquarters. Site 41JN19 was previously recorded and evaluated in 1997 as part of an inventory and assessment of archeological resources at the park (Ralph et al. 1998). The 2018 survey was initiated to map and describe historic features related to the CCC camp and provide updated research information for interpretive and operational planning. The 26 ac area surveyed in 2018 encompassed the full extent of the area where the park staff has proposed an interpretive trail. This trail is envisioned to include interpretive signs with information

on the CCC camp and highlight the work of the CCC at the park. The trail is expected to be family friendly and mobility-impaired accessible due to the flat terrain and close access to existing parking. The construction of the trail is not expected to have any ground disturbing impacts due to the flat terrain and plans to mow in the trail and lay mulch to outline a path. The survey area includes site 41JN19 as recorded in 1997, as well as an expanded area that includes additional CCC features discovered by park staff during the intervening years. At the time of this report, there has been no formal consultation with Texas Historical Commission (THC) because the project construction plans have not been completed. If placement of interpretive signs and/or stabilization of key structures are contained in the final plans, TPWD will follow protocol in consulting with THC.

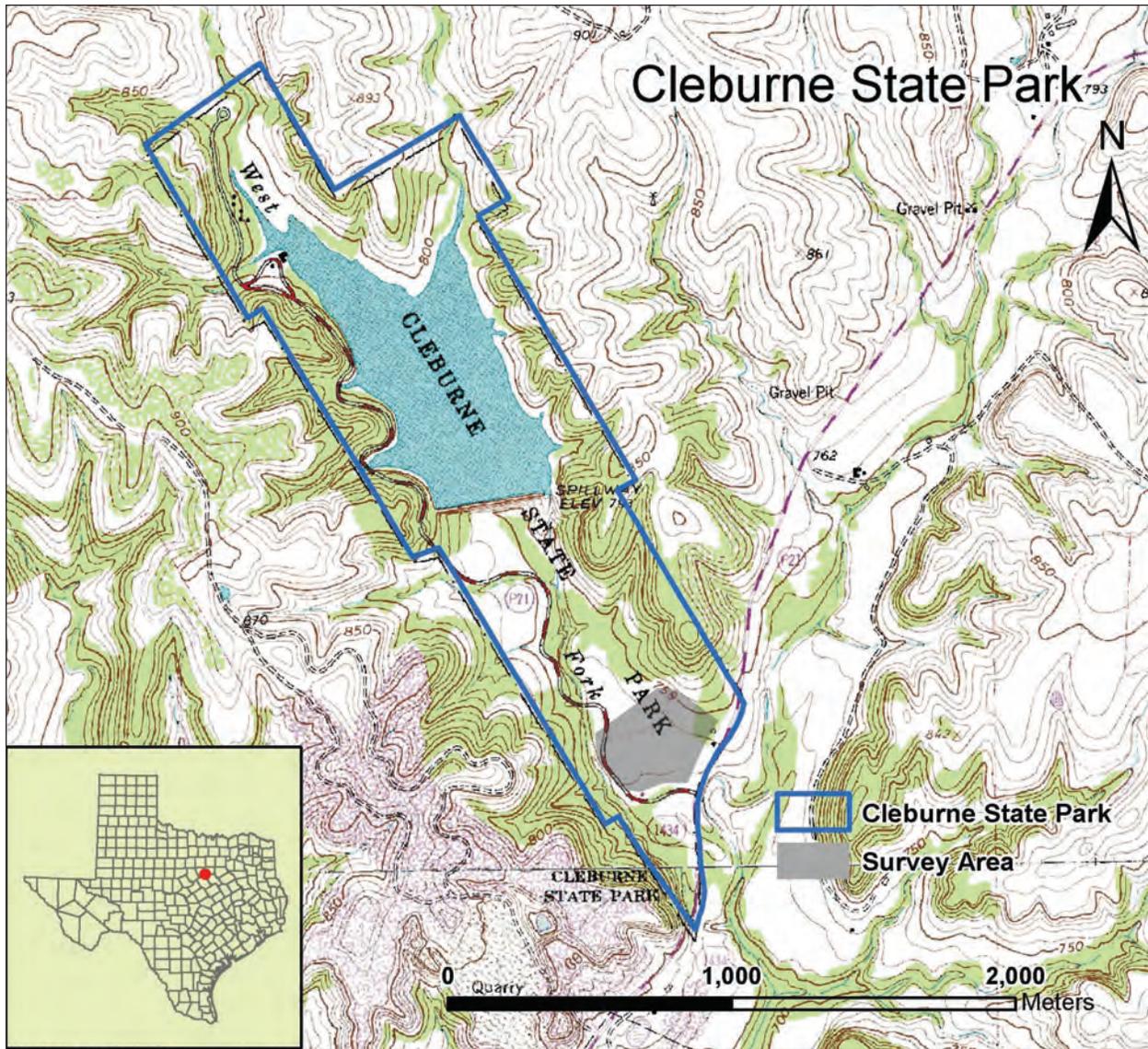


Figure 1. Project location map.

The surveyed area includes the property encompassed by the Park Road 21 to the east, the park residence and private drive to the south and the maintenance area on the north and west (Figure 2). Feature recording was limited to archeological and structural features related to the construction and occupation of the CCC camp and did not include CCC-built infrastructure for park operational or recreational use, except for some features where the affiliation or use

of the feature was undetermined. The CCC encampment (or camp) is formally known as SP-53-T (State Park Technical Camp 53) and was built and occupied exclusively by CCC Co. 3804 (Figure 3) from 1935 to August 1940.

ENVIRONMENTAL SETTING

The park contains 528 ac of public land centered on the 116 ac Cedar Lake located in the northern half of the park. The CCC constructed a dam and spillway on the West

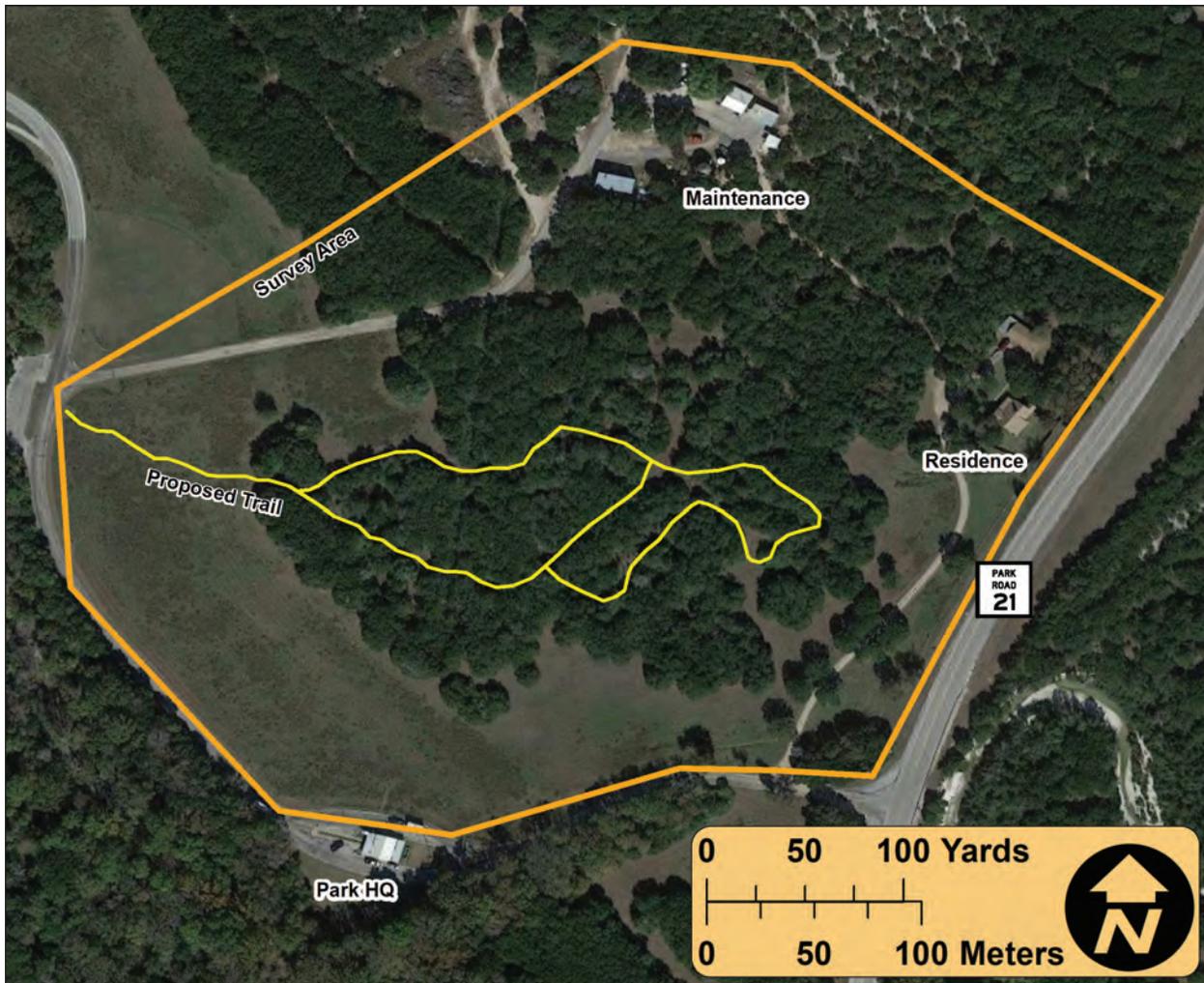


Figure 2. Survey area map.

Fork of Camp Creek to impound Cedar Lake. The West Fork of Camp Creek continues to the southeast through the park below the dam. The park is located within the Nolan-Aquilla Soil and Water Conservation District. The Brazos River drainage is located about 14 km south of the park (Dismukes 2001).

The park is within the Cross Timbers and Prairies ecoregion of Texas (TPWD 2019a). It is also classified as being in the Grand Prairie subregion of the Blackland Prairie natural region (Arnold et al. 1978). The park is in a rugged limestone breaks setting similar to the terrain found in the Lampasas Cut Plain

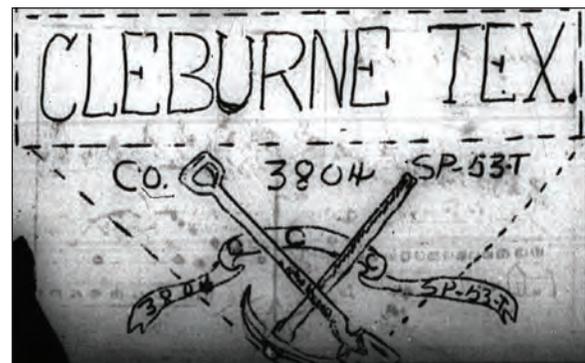


Figure 3. Logo Sketch for Co. 3804 from the 24 July 1936 edition of CCC magazine *Cedar Braker* (TPWD 2019b).

to the south (Ferguson 1986; Dismukes ed. 2001). These geographic features are due in part to the Cross Timber sandstones which are bordered by the Grand Prairie to the east and west, and the Lampasas Cut Plain with stair step topography, south of the park. Elevations within the park are generally between 210 and 260 m above mean sea level.

Native vegetation in the Grand Prairie natural subregion consists of tallgrass prairies in the uplands and elm, pecan, and hackberry in the deeper soils found in riparian areas. Modern vegetation at the park includes a dense cover of woody vegetation with the majority consisting of Ashe juniper (*Juniperus ashei*) and privet (*Ligustrum*). Privet was purposefully planted by the CCC in the 1930s for landscaping and has now spread in dense thickets across the park (Sanders 1997). Additional trees at the park include red bud, Texas oak, live oak, hackberry, cedar elm, and American elm (Ralph et al. 1998: 96). Oral histories of former CCC workmen indicated that large, old growth stands of hardwoods including walnut trees were removed during construction of the dam (Vetter 2000).

A geoarcheological investigation was conducted by Lee Nordt (Ralph et al. 1998), who determined that there are four geomorphic surfaces in the park: upland, floodplain, terrace, and colluvial toeslope. The conclusion of this study was that a major portion of the park consists of uplands with low potential to contain buried, intact archeological sites. However, the toeslope colluvium, terrace alluvium, and floodplain alluvium date to most of the Holocene period and may contain sites up to 5-m deep dating to the Early Archaic. Floodplain deposits likely contain sites dating to the Late Archaic and Late Prehistoric. Nordt discovered that the terrace soils along the West Fork of Camp

Creek are underlain by alluvium rather than bedrock and that the soils are loamy rather than clayey. Soil development observed in backhoe trenches indicated similarities to soils at Fort Hood in Bell and Coryell counties dated to the early and middle Holocene (Ralph et al. 1998:99). The terrace soils are up to 5-m thick. The valley floor below the dam consists of mixed Quaternary alluvial floodplain deposits and colluvial slope wash deposits, depending on the location. These sediments have buried A soil horizons that are over 3-m deep across the valley. Above the Quaternary fill is Comanche Peak Limestone, a fossil-rich series of 0.3 to 1.6-m thick beds with a total thickness of about 27 m. The CCC built dam on Cedar Lake is set into this formation. The current survey area sits in the valley floor adjacent to the limestone bearing slopes.

The soils in the park are easily eroded, especially in areas lacking groundcover. There are five general classes of soil that can be found within the park (Dismukes et al. 2007). The clay soils are shallow on rolling land or steep slopes and stony in areas that have between 12 to 20% slope. The clays are classified as Purves-Tarde varieties. The sandy loam, which is on the floodplain along streams, is classified as Bolar-Clay variety. There are some deep clays in the rolling uplands and valleys and some gravelly clays in areas over soft limestone. Surface soils in the current project area are mapped as three units, the Aledo-Bolar association (1-8% slopes) within the central portion of the camp survey, the Brackett-Rock outcrop complex (mapped as steep) on the north eastern edge of the survey area near the maintenance complex, and the Sanger Clay (1-3% slopes) along the western and southern portions of the survey area (Natural Resources Conservation Service 2019).

CULTURAL SETTING

Standard cultural histories are available for the park and are not reproduced in this report. For more details regarding the prehistoric and historic time periods for the park and surrounding areas see Ralph et al. (1998), Dismukes et al. (2007), and Ramsey (2012). Previous archeological investigations include a baseline inventory survey of portions of the park, various small impact projects, and research or management related projects. Only those operational and research projects relating to the current project area are included here. For additional information on CCC park architecture, see the inventory and condition assessment conducted by Freeman (2009).

Former TPWD archeologist Ron Ralph coordinated an archeological survey, geomorphological investigations, vegetation studies, and historical investigation at the park during the summer of 1997 (Ralph et al. 1998). Two hundred acres of the 528 ac park south of the Cedar Lake dam, including the current project area, were subject to an intensive survey that included shovel and auger testing in addition to pedestrian survey. The results of the geoarcheological investigation (Ralph et al 1998:98-104) were used to determine the level of subsurface testing necessary to identify buried archeological sites at the park. A reconnaissance survey was conducted in the uplands above the dam. A total of 24 sites was recorded including eight prehistoric sites and 16 historic sites. The historic sites include the CCC Camp, two CCC quarries, 12 trash dumps associated with the CCC camp and early state park years, and a dump with earlier material (Ralph et al. 1998:92).

Previous Research and Assessments at 41JN19

Former TPWD Cultural Resources Coordinator Diane Dismukes conducted archeological assessments of the park's historic features including the CCC camp (41JN19), trash dumps associated with the CCC occupation of the camp and construction activities, and other historic period sites and CCC-era features in the park. Summaries of these investigations, as well as previous surveys are included in the latest resources management plan (RMP) for the park (Ramsey 2012). The RMP was originally compiled by TPWD staff in 1996 (Grubbs and Ralph), updated in 2004 with a cultural resources inventory and recommendations for each site (Dismukes 2004), revised again in 2007 to include updated natural resources background information (Dismukes et al. 2007), and updated with new formatting and additional background information in 2012 (Ramsey). All drafts and completed manuscripts are on file at TPWD.

Between the RMP revisions in 1996 and 2004, Dismukes (2001) consulted with THC regarding park cleanup efforts and recorded historic dumps. She made recommendations to reconsider the State Antiquities Landmark (SAL) status of a number of those sites including 41JN19. She ultimately concluded that 41JN19 warrants nomination as a SAL and may be eligible for inclusion on the National Register of Historic Places (NRHP). Dismukes, discussing the CCC camp (41JN19) specifically, argued that previous TPWD recommendations based on the 1997 survey stated that all sites within the park were eligible for designation as SAL due solely by their being located on state owned land (Ralph 1998, in Dismukes 2001). Six of the sites were considered by the investigators to have NRHP potential (Dismukes 2001).

In summary, the 1997 report discussed each of the historic sites beginning with 41JN19. At the termination of park construction, the buildings and structures within the CCC camp were dismantled, and some were relocated to another CCC camp. During the 1997 survey, no shovel tests were excavated, however all of the auger tests excavated in the cleared areas were negative. Various features associated with the camp were relocated such as a water fountain, a fishpond, part of a septic system and a cistern. The recommendation was made that this site was eligible for designation as a SAL as well as listing on the NRHP. No research design was proposed or formal recommendations made in conjunction with the 1997 survey report (Dismukes 2001).

Dismukes went on to argue that, based on sufficient archival material and historic documentation (including oral histories, archived camp newsletters, and National Park Service [NPS] records), it “would be difficult to imagine what anthropological question could be asked of this location that could not be answered” (2001:1-2). The letter report outlined the geomorphological research conclusions that there was a low probability of finding subsurface archeological deposits. Dismukes concluded that there were no grounds for recommending the site as eligible for inclusion on the NRHP under Criteria B, C, or D. In conclusion, the recommendations to THC were that site 41JN19 may be eligible for inclusion on the NRHP, and on this basis the site warranted nomination as a SAL because the CCC camp has an association with events that have made a significant contribution to the broad patterns of our history (Dismukes 2001).

41JN19 is the site of the CCC Camp SP-53-T where the men of Co. 3804 (referred colloquially as “CCC boys”) lived while they constructed the dam and other structures for

the park. The area is now covered by heavy brush including Ashe juniper and privet. The boundaries of this site were arbitrarily set in 1997, based on the current brush line inside which features are located (see Figure 2). Park personnel have also recovered prehistoric lithic artifacts from the CCC camp area including two Paleoindian points (identified as an Angostura and a Plainview) and two biface fragments. A light surface scatter of artifacts has been previously noted. Backhoe trenching in another area of this relatively level floodplain indicated buried, possibly intact subsurface prehistoric archeological features (Ralph et al. 1998). The lithics recovered from the surface of the CCC camp site may have been the result of disturbance of a buried prehistoric site by CCC activities, or they may have resulted from surface collecting done by CCC enrollees at other locations (Ramsey 2012:22). Early park constructions in the area includes the maintenance complex, access roads and materials storage. Previous management practices in this area, going back to at least the early 1990s, included avoidance of any subsurface excavation.

Other specific recommendations by park management, as noted in previous RMPs, include incorporating the camp features and history as part of an interpretation of the CCC era at the park. Recommendations have included vegetation clearing and the possible addition of ghost structures laid out to define the original CCC camp. This type of interpretation is not typically available in state parks. Documentation including photographs and oral histories make this a prospective location for interpretive exhibits and programs and the possibility of including a museum focused on this specific time period in history (Ramsey 2012:75-76).

Historic Occupation of the CCC Camp

The construction of Cedar Lake originated in the earlier plans for Naomi Lake, a private recreational lake (Maxson and Wagner 1997). These plans were abandoned, and the property reverted ownership to the Cleburne State Bank due to higher than expected costs and a prediction of lower than adequate visitation to justify the investment due to the economic downturn known as the Great Depression. By 1936, the City of Cleburne was able to acquire the Naomi Lake property in addition to other parcels to meet the 500 ac minimum for eligibility to receive federal funds and for mobilization of the CCC (Maxson and Wagner 1997:110).

CCC Company 3804 was stationed at Camp SP-53-T (Figure 4) with the primary task of building the Cedar Lake dam. They also constructed the park road, trails, bridges and culverts, retaining walls, picnic areas, the entrance portal, caretaker's residence, water well and storage tank, and various other park infrastructure (Steely 1999; Freeman 2009). NPS records indicate that the dam dominated planning and construction efforts at the park (NPS 1934-1939).

METHODOLOGY

Research Methods

Historic archeology is a valuable tool in defining the lifeways of past undocumented people as well as those for which extensive textual references exist. The best documented historic period activities at the park are those of the CCC. They constructed many of the facilities that are enjoyed by park visitors today as a result of the government initiative to employ young men during the Great Depression in the 1930s. The U.S. Army and NPS jointly administered the program and the young men that participated in this effort constitute a group with a rich textual

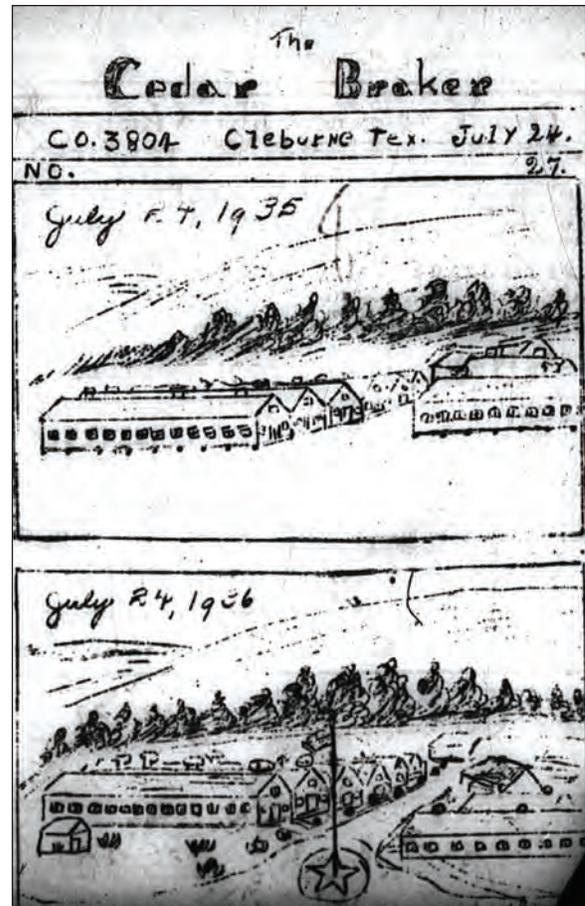


Figure 4. Sketch Map of Camp SP-53-T from the 24 July 1936 edition of CCC magazine *Cedar Braker* (TPWD 2019b).

component. The work they performed is well documented through reports, memos, letters, photographs and other sources.

Questions that could be asked of the potential data related to Camp SP-53-T go beyond those of feature placement. Although site development and camp layout are important facets of human organizational study, more specific information about daily life could lie buried in the area. Documents indicate that formal landscaping was a part of the camp, including a rose garden and evidence of this may be ascertained through archeological exploration (Ramsey 2012). Material

cultural remains frequently provide data demonstrating that textually documented rules of conduct were not followed.

The impetus for this survey came in 2018, when park management again expressed the interest in incorporating the CCC camp area into the interpretive overview of the park, with the added incentive that the park's 80th anniversary celebration was approaching (1940-2020). Although several archeological investigations have been conducted at 41JN19, there were no detailed maps or geospatial data on individual features, isolated finds, artifact densities, or other surficial expressions related to the historic construction, occupation, and abandonment of Camp SP-53-T. Previous studies have not documented individual site elements using archeological field methods.

Field Methods

For the purposes of recording the archeological data and redefining the site boundary for 41JN19 based on the spatial distribution of camp related features and artifacts, TPWD archeologists followed established methods employed at previously investigated CCC camps on TPWD managed properties most recently at Mother Neff State Park (Miller 2012), Palo Duro Canyon State Park (Barnes and Lyle 2018) and Tyler State Park (Mahoney 2018). Due to the temporary nature of CCC camps, they are best recorded as archeological sites and managed as TPWD cultural resources using best practices. The project archeologists set out to include only the CCC camp infrastructure (comprised of the structural remains and related utilities built for housing, temporary workspace, and storage for CCC activities) within the archeological site boundary, description, and feature inventory. The rationale for the distinction between the camp and park infrastructure is based on the

intended design of the camp as a temporary living space. The CCC camp functioned as temporary housing and workspace for the CCC enrollees, while the park infrastructure built by the CCC companies was intended to serve as a permanent built environment with recreational and operational facilities of the park. The research design and survey methods established that the features included within the site boundary and inventory should not include permanent infrastructure. Based on previous research at 41JN19, other types of non-structural features (e.g. quarries or culverts) were not expected to be present. However, standard survey methods were applied and included documentation of any historic features or isolated finds (IFs) located within the survey area if encountered.

TPWD archeologists determined that a 100% pedestrian survey of the CCC camp area was the most efficient way to collect accurate locational data for feature locations. During the pedestrian survey, a crew of three to four archeologists walked transects, primarily following UTM northings or eastings. The survey was bounded by roads on the east, west and south. The northwestern edge of the survey boundary was extended north of the maintenance road on a bearing expected to include a dense area of vegetation and a known concrete slab and into a materials storage area west of the maintenance shop complex. The north edge of the survey block was based upon the northernmost previously recorded CCC feature (i.e., the incinerator) and the park maintenance area, as well as operational needs to maintain some distance between the proposed interpretive trail and the manager's residence (see Figure 2). The transect intervals were spaced at 15 m due to dense vegetation, which also did not allow for strict maintenance of this spacing. All CCC camp features were recorded on a

project specific feature form used to record information on whether the feature is affiliated with the CCC camp, the feature type, size, noted construction materials, GPS map coordinates, general condition, photograph numbers, and comments. More specific and unique descriptive data along with a listing of surface artifacts was included in the comments. Locational data was collected on Trimble GPS units with sub-meter accuracy. Points were collected at structure corners or end points. All constructed features were photographed, and sketch maps were drawn for most architectural features. Artifacts, when observed, were recorded using GPS point plots and in relation to specific features. Shovel testing was not conducted during this survey based on findings of the initial archeological survey which resulted in negative auger tests along with the geoarcheological investigation indicating that historic sites would not be buried in this context (Ralph et al. 1998).

Prior to the archeological survey, park staff scouted for remnants of the camp focused on finding structural remains, conducted research, and obtained photos and other documentation to guide their interpretive planning. In the interests of preserving the CCC camp remains, park staff intermittently cleared privet and underbrush within the general area of the CCC camp. However, privet is difficult to keep out and regrows more densely after being cut.

RESULTS

Although other uses were proposed for the CCC camp buildings, they never materialized, and the Army removed the temporary buildings from the CCC camp location at the park in 1940 and did some cleaning up of the area (Maxson and Wagner 1997). However, there may still be remnants of the occupation that escaped the historians'

attention. A small number of prehistoric artifacts, including diagnostic projectile points, have been recovered from the area and may be the result of enrollees collecting from locations around the park while they were stationed there. In addition, a four-hole button was previously recovered in another area of the park (Ramsey 2012), substantiating a detail learned from oral histories involving enrollees of the camp. Oral histories conducted in 2000 with three CCC veterans (James J. Johnson, Alvis D. Reeves and Jake Mullen) provide a wealth of firsthand information useful in documenting camp facilities and interpreting the archeological record at Camp SP-53-T (Vetter 2000).

Archeological investigations of the 26 ac area which contains the remains of the CCC camp area resulted in the recording of 17 historic features. These included seven concrete slabs and/or foundations, three concrete blocks or pedestals, three probable septic tanks or cisterns, a fire pit, a water fountain (masonry), an incinerator (masonry and brick), and a concrete lined pond. All features were constructed of concrete, often reinforced with rebar, or using masonry construction with stone or brick bonded with mortar and/or grout. The concrete slabs appeared to be screed and/or troweled, with the larger building foundations having a brushed or broom finish. In addition to the features, historic artifacts were observed despite the dense understory vegetation and leaf litter.

Feature Descriptions

Feature 1 is a multi-room concrete foundation, representing the remains of the combined camp bathhouse and latrine. The concrete slabs measure a total of 19 x 6 m. The concrete lined trench or trough within the narrow, linear room has been

partially filled with large pieces of limestone. Portions of the stem walls are missing. Leaf litter covers some of the concrete and brush surrounds and impinges upon the foundation. However, park staff have been clearing the encroaching privet and vegetation during 2018. This set of concrete slabs contain evidence of multiple finished rooms with frame bolts set along a perimeter stem wall. It is a rectangular slab with three attached rooms connected including two slab floors with slightly different finish elevations and a narrower linear floor on the north end of the building. A steel box container set in concrete on pivots is located on the end of an interior wall within the wider portion of the building. This container likely functioned as a way to dump water into the trough, assumed to be the latrine. This slab/room is connected to the central room with a doorway. There is a concrete pad located outside the building door with an iron boot scraper set to the side that likely served as the entrance landing and is considered a porch, however, there is no evidence of additional support posts for a formal porch.

Feature 2 is a concrete pedestal, possibly part of a gate which would have had with an arm going across a road, as seen in a camp photo. It measures 53 x 51 cm at base; 37 x 31 cm at top; and 82 cm in height. It was intact with some light spalling of the concrete. The threaded bolts are intact. It was constructed of formed concrete with a square base that is tapered to the top with four threaded bolts on the top.

Feature 3 represents remains of a picnic type fire place and should be considered a part of the park architecture rather than feature associated directly with the CCC camp. It measures 170-cm long, 120-cm wide, and is 30 cm in height above ground surface. This feature is made of rough-shaped cobble/tabular and rounded masonry with two intact

courses of stone on the northeast side, but it once contained an additional third course of stone indicated by prints in the mortar on the top surface. The center of the feature is obscured with duff and privet saplings. The southwest edge has deteriorated.

Feature 4 is a small concrete foundation measuring 106-cm long and 64-cm wide. The finished concrete is smooth and appears to be in place as it lies flat. It is partially covered with duff. The feature possibly represents an addition to a pier and beam structure, perhaps a landing.

Feature 5 represents a set of two parallel underground septic tanks (Figure 5). Measurements for Tank 1 are 12.5-m long, 1.3-m wide, and 60-cm deep. Tank 2 measures: 1.5-m long and 0.9-m wide, with an exterior wall thickness of 10 cm. The outer walls are collapsing, and a large juniper tree is growing into the wall at the northwest end of the structure. Tank 1 contains three chambers with concrete baffle walls and is oriented northwest-southeast. The smaller Tank 2 is located on the southwest side of the larger tank. Tank 1 has a galvanized inlet pipe (11.4 cm ID) on the southeast wall approximately 20 cm below surface.

Feature 6 is a small concrete slab with an embedded galvanized pipe. The slab is approximately 2.15-m long and 1.3-m wide with the long axis oriented southwest-northeast. The condition was described as containing a cracked concrete slab with a brushed surface. It may have been a support for a pier and beam structure. The slab is approximately 5 m south of Feature 5. A galvanized pipe (3.2 cm ID) rises approximately 23 cm above ground surface at approximately 1.3 m (bearing 270°) from the western edge of the slab.



Figure 5. Photograph of Feature 5.

Feature 7 is a small concrete slab and unattached stair steps. It is located adjacent to a cluster of features (5, 6, and 8). This slab is 120 x 120 cm with steps measuring 75-cm long and 65-cm wide. There are no obvious cracks or missing concrete on the steps. The slab has intact edges and is flush with the ground surface. The steps were constructed in a single pour, probably in a form, with two treads and no associated hardware. The concrete finish is smooth and brushed with mold-form lines. The lower tread is at 10 cm above ground surface and the upper tread is at 35 cm above ground surface

Feature 8 is a set of two small concrete slabs measuring, with one measuring 210-cm long and 125-cm wide, and the other measuring 60-cm long and 40-cm wide. The larger slab is flat, smooth, and appears undisturbed (in situ). The smaller slab appears to be askew and may not be in situ. These two concrete slabs are located in close proximity and may have been associated with a larger pier and beam structure.

Feature 9 is a single in-ground septic tank or cistern. It measures 8.2-m long, 1.0-m wide,

and 60-cm deep. The depth was measured from the top of the opening to the lowest level of debris fill accessible. The concrete is deteriorating where exposed. The tank is collapsing and is a potential hazard. This in-ground concrete-lined tank contains three openings. Near the west end is an opening containing a concrete lip set for a lid, although no lid was observed. The west chamber opening is 67 x 67 cm, and the middle opening is 1.7-m long and 47-cm wide with a mesquite tree growing out. The interior contains rubble and vegetation.

Feature 10 is a concrete block measuring 50-cm long, 46-cm wide, and 33-cm high. The concrete is smooth and doesn't appear damaged. The block may be resting on its side and not in situ. This rectangular concrete block with a square hole through the center is similar to a cinder block with one hole.

Feature 11 is a concrete slab and probable foundation measuring 9-m long and 5.5-m wide. The concrete has a smooth finish but is deteriorating with a piece missing from the west corner. It is a formed concrete slab with two joints on the long side where two additions were made to the original slab. The slab is located in a current maintenance area of the park and may have had a basketball hoop added at one time.

Feature 12 is unique feature described as a concrete lined pond. Archival research concluded this was likely the fish pond as noted in CCC camp records and maps. It was recorded in the field with maximum dimensions of 8-m long and 7-m wide and is roughly kidney shaped. Exact dimensions were recorded via GPS. The concrete finish was different than that found on slabs in the area and may be more of a plaster or special blend of concrete for use in a water feature. It is cracked in many places with duff covering much of the concrete surface and

dense vegetation/privet growing along the perimeter. The pond contains two distinct sections, an upper and lower. There are four possible drains, two on each end. Tabular rocks are stacked on the concrete lip at the north end and other large rocks are set on the perimeter. These were likely part of the landscaping additions for rose beds, referred to as a rockery.

Feature 13 is the masonry drinking water fountain. It may not have been used as part of the CCC camp but rather intended as park infrastructure. It measures 1-m tall, 80 cm \varnothing at the base and 75 cm \varnothing at the top. The water fountain is generally intact although the rim of the fountain bowl is broken off. The fountain is of limestone block construction with an hourglass shape. There are 10 courses of stone including the rim. The standpipe and spigot are galvanized.

Feature 14 is described as a concrete box measuring 1.5 x 1.5 m and 60-cm tall, with an opening measuring 38-cm long and 30-cm wide and has 11-cm thick walls. Fragments of rotted wood and wire nails are inside the box. The box appears intact and contains a 2" galvanized pipe protruding from the opening. It extends approximately 12 cm above the box. A $\frac{3}{4}$ " galvanized pipe extends approximately 1 m out of a corner of the rough, circular opening.

Feature 15 is a small concrete slab measuring 122-cm long and 66-cm wide and approximately 8-cm thick. The concrete is in good condition although bolts on the slab surface were cut or flattened. This small concrete slab is aligned with the southwest corner of a standing building next to the CCC water tower (currently serving as a tool storage room). Park staff noted that the building was moved to its current location from elsewhere in the park, however the former location is not known. The slab is not

adjacent to a door opening of the building and so likely predates the building at its current location. The slab has four metal bolts or rebar, one at each corner. The metal has been cut or flattened to be flush with the slab.

Feature 16 is a brick and stone incinerator with an open top and grate. It measures 270-cm long, 230-cm wide, and 150-cm tall and is intact with a minimal amount of loose stone and some burned debris (evidence that the incinerator has been used in the modern park era). The incinerator has probably been regouted. The brick lining may have partially collapsed or been intentionally dumped in the bottom of the structure. It is an open top masonry structure with air/clean out ducts on the lower south face at ground level and contains a fire brick-lined burn box with tan bricks marked MALAKOFF. The exterior stone is in good condition with some missing and loose grout on the top course. The incinerator was well constructed and maintained. A pair of hinged metal grates with rebar frames and handles are set in stone and group on the top. Names, initials, and numbers are visible on the east-top lip. Some are covered by a loose mortar patch.

Feature 17 is a probable septic tank. When encountered by the survey crew, only a small portion of the feature was visible at ground surface. Still buried and presumably in situ, the extent of the feature could not be determined, and no accurate measurements or descriptions were possible.

Researchers attempted to positively identify each feature using its functional designation (such as camp headquarters, dining hall, or barracks). Work on previous CCC camps has resulted in less than satisfactory results for positively identifying all extant features within the camp (Barnes and Lyle 2018; Miller 2012). The research at the park has not

recovered architectural or engineering plan maps for the camp; these are not routinely drawn by NPS planners for each park. If available, they would perhaps show the NPS planned layout for the camp. However, the archival materials for the park do include a sketch map entitled Fire Control Plan from 1940 (NPS 1940; Figure 6). This planimetric map is drawn to a known scale, but it may not include all buildings at the camp. Within the established camp area northeast of Camp Creek, icons are included that indicate key facilities with labels including: Well & Pump, Dwelling, Radio C.C.C. Co. 3804, Tech. Service Bldg's, and Fire Tool Cache. The R.E.A. Power Line is also labeled running west of the camp

area. The Co. 3804 Camp is indicated with a series of eight sketched representations of buildings in two parallel rows. This would indicate the center of the camp known as Barracks Row, based on oral histories (Vetter 2000:32, 76, 103). Other mapped structures include the two structures labeled as the dwelling to the east of Barracks Row representing the caretaker's residence; with the structure on the south being the house and the one on the north being the carriage house or garage. The well and pump are north of Barracks Row connected to the dwelling with a water line (indicated with a W on the map). The two structures labeled as technical service buildings with the fire

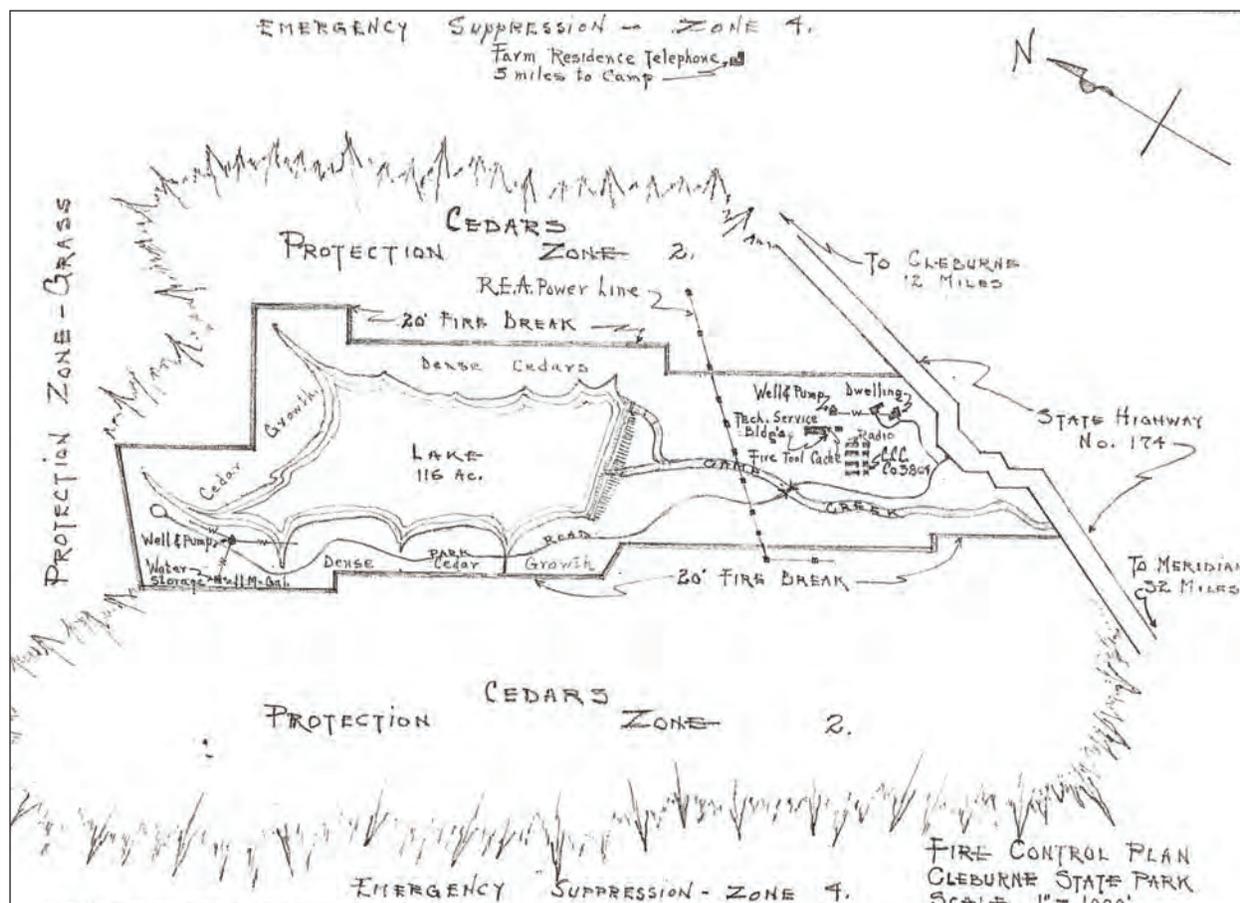


Figure 6. CCC map entitled Fire Control Plan.

tool cache are also north of the main row but closer than the well. The fire tool cache is indicated on the southeast of the larger service building. The radio is also noted at or near the northeasterly most building in Barracks Row. This map was helpful in orienting these important buildings within the main camp after field mapping was completed.

A topographic map was also produced by the NPS and Texas State Parks Board. This draft version, dated 03/03/1936, includes draftsman mark-ups and pencil nub marks (NPS 1936; Figure 7). In the upper right quadrant corresponding with the CCC camp area are 10 separate rectangular drawings (facilities) labeled as: Well, Office, Truck Storage, Gar., B.S., T, Tech and Officer, Inf, Mess, Barracks, and one unlabeled. The plan

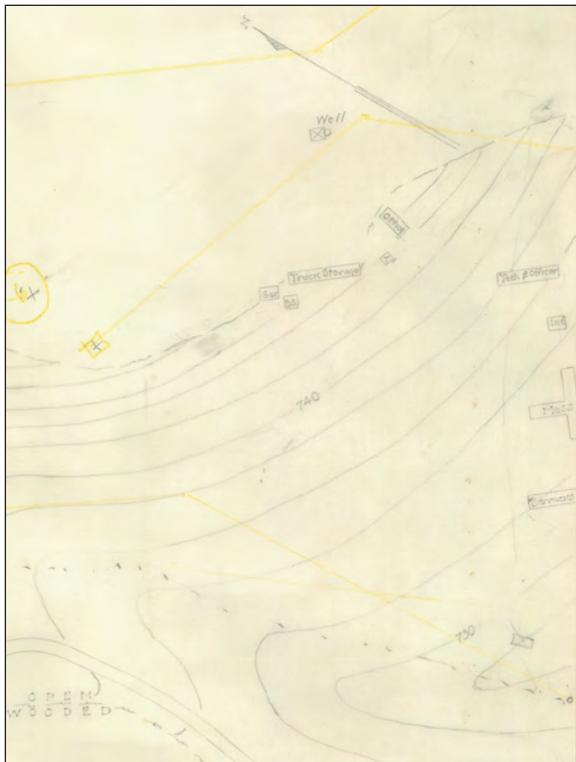


Figure 7. Topographic map dated 3-3-1936 that shows camp buildings.

view with contour lines does not appear to include all of the area for camp at that time and two buildings are cut off along the right edge of the drawing which would be to the south and southeast of the main part of the camp.

In addition to the fire suppression map there are several photos of the camp which are available based on previous archival research. Some appear to be from the NPS archives and others were donated by former CCC enrollees. Of these, three were used in this investigation: a panoramic view noted from September 1935, a panoramic image labeled as Camp View, and another panoramic photograph of the camp from May 1939 (TPWD 2019b). The first is a photograph with pen or pencil lettering across the top stating, “These pictures were donated by John (Red) Williams. Taken Sept. 1935,” followed by an address (Figure 8). The photograph labeled with Camp View is from an undated collage including images of the recreation hall, mess hall, Company 3804 roster and photo roster (Figure 9). This photo collage is likely the one donated to TPWD by Alvis Reeves in September 2000, as noted in the oral history transcripts (Vetter 2000:83). Comparing this photo to the 1935 and 1939 camp photos and looking at the building arrangements and vegetation size, the Camp View photo was likely taken later in the camp’s history, ca. 1939. The highest resolution photograph is the panoramic view developed by E. L. Rothwell of the National Photo and News Service, San Antonio, Texas. This sepia toned photograph contains a printed title on the image stating, “Camp SP-53-T Home of CCC co. No. 3804 Cleburne Texas, May, 1939. 1st. Lt. James B. Sellers, Com’d’g” (Figure 10).

Additional records at TPWD obtained from NPS archives in Denver include a memo dated April 17, 1939, approximately one month

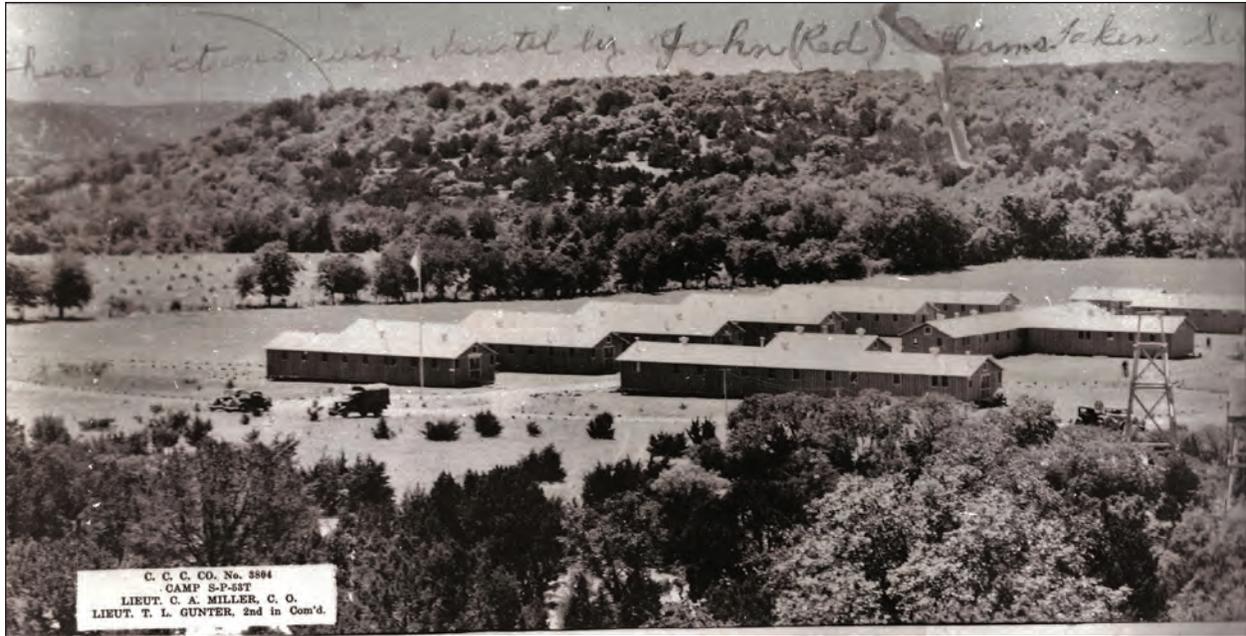


Figure 8. Panoramic photograph dated September 1935 (TPWD 2019b).



Figure 9. Panoramic photograph ca. 1939 (TPWD 2019b).

before the higher quality camp photograph was taken (TPWD 2018). This memo, from the CCC Headquarters Company 3804, contains a report of buildings with corresponding footprint dimensions at the camp (Table 1). It also listed buildings whose maintenance is the responsibility of the Army and their dimension: the Dynamite Magazine (3.4-m long and 2.1-m wide), Cap House 1.2 x 1.2m

and Aux. Store Room (6.4-m long and 5.2-m wide). The listed buildings included in this camp inventory are: five Barracks, Officer’s & Tech. Quarters, Recreational Hall, Bathhouse and Latrine, Infirmary, Army Headquarters & Supply, Army Oil House, Generator House, Mess Hall and Kitchen, five School Buildings, Woodworking Shop, Reading Room & Library, Army Store House, Technical Store House,



Figure 10. Panoramic photograph dated May 1939 (TPWD 2019b).

Table 1. List of CCC buildings 17 April 1939.

Building	Size (m)
Barracks (n=5)	33.5 x 6.4
Officer's & Tech. Quarters	35.4 x 6.4
Recreational Hall	33.5 x 6.4
Bathhouse and Latrine	11.3 x 6.4 and 7.9 x 9.4
Infirmary	10.1? x 6.4
Army Headquarters & Supply	22.9 x 6.4
Oil House, Army	6.1 x 5.5
Generator House	4.0 x 3.0
Mess Hall & Kitchen	37.5 x 6.4 plus 7.3 x 6.7
School Buildings (n=5)	6.1 x 5.5
Woodworking Shop	11.3 x 6.4
Reading Room & Library	9.4 x 6.4
Store House, Army, Auxillary (sic)	6.1 x 5.5
Store House, Technical Service	6.4 x 4.9 plus 7.3 x 6.7
Office, Technical Service	5.5 x 5.5
Blacksmith Shop	5.5 x 5.5 plus 2.7 x 1.8
Garage, Technical (15 cars)	42.1 x 6.4 plus 7.0 x 6.4
Garage, Technical (9 cars)	9.4 x 6.1
Mechanic's Shop & Light Plant	6.1 x 6.1 plus 6.7 x 3.0 plus 3.7 x 2.4
Pump House (Octagon Shape)	4.3 maximum?

Technical Services Office, Blacksmith Shop, two Technical Garages, Mechanic's Shop and Light Plant, and an octagonal shaped Pump House.

The TPWD archives (TPWD 2019b) contain 23 images for the park. This collection includes a park development map showing a planned golf course in the area of the camp; Mess Hall interior (ca. 1935); Recreation Hall (1932-1942) showing men playing billiards, ping pong and cards, with electric lights and the double doors at the end of the building; a series of seven training photographs (ca. 1935) demonstrating proper use of hand tools and techniques, but also including views of some camp buildings in the background; and a collage of the park ca. 1936 with a panoramic photo of the camp layout labeled the Camp View discussed previously (see Figure 9).

One of the main features determined to be ideal for interpretation of the camp includes the bathhouse and latrine foundation. It was described on the recording form as a multi-room concrete slab with framing bolts set along the perimeter stem walls. There is a concrete pad (a porch) outside of the building door (on the northeast side) with an iron boot scraper set off the side of the slab. The feature included a rectangular set of slabs with three interior sections (rooms) attached to a narrower linear section (room) on the north end of the building. A large steel-lined box or container with a pivoting axle was in a concrete lined trench (filled partially with large rocks) within the interior of one of three rooms. This room is interpreted as the latrine portion of the combined bathhouse and latrine (Figure 11). The three are connected by a threshold (likely marking a doorway). This component was later determined to be part of the plumbing system used to flush the communal style latrine pit. The central slab (or room) was



Figure 11. Photograph of water flushing feature in latrine and bathhouse.

apparently furnished with sinks for washing and shaving. The slab on the south end (to the left of the entrance door) was described as the communal shower room. This overall complex of features matches the description provided in the oral histories (Vetter 2000) given by Johnson (2000:41-43), Reeves (2000:77-78), and Mullen (2000:109) as the bathhouse and latrine. This bathhouse was obviously for the camp use and should not be confused with the bathhouse designed (with corresponding architectural drawings and other documentation) and built by the CCC for public recreational use in the group camp area on the west shore of Cedar Lake.

An additional large foundation (Feature 11) was mapped to the northwest of the maintenance area. This represents the second largest slab (after the bathhouse) found in the survey and is offset from Barracks Row. It is possibly the foundation of the structure identified in the foreground of the panoramic photos of the camp taken (all taken from the water tower/pumphouse or near it), and/or shown on the Fire Control Plan as the Tech. Service Bldg's (see Figure 6).

Additional miscellaneous features with unassigned functions include concrete debris and small concrete slabs smaller than a foundation for a fully functioning building. These may represent small pads used for entry landings to technical buildings, offices, education buildings, or support of pier-and-beam constructed barracks. They tend to be clustered near the main area identified as Barracks Row. A set of concrete steps (Feature 7) and adjacent slabs near a septic tank (Feature 5) and additional slabs are unidentified. There are no concrete steps visible in the archival photos, as this central location of the camp is obscured by the cluster of standing buildings seen in the photos. This set of septic tanks and the additional feature identified as septic tanks or cisterns (Features 9 and 17) obviously served as part of the sanitation systems for the camp but were not directly identified as to what, if any, associated structures were served by them.

Other structures considered to be recreational or comfort amenities consist of three features defined in the 2018 survey and alluded to in the earlier survey (Ralph 1998), including a water fountain, a fish pond, and outdoor fireplace. The water fountain (Feature 13) has been noted in previous research but not mapped or described. It is not observed in the archival photos and may have been constructed slightly later than the CCC construction period by park staff. There is an undated historic photo on file showing a man and dog beside the intact water fountain which may be used to help interpret this feature as a stop along the interpretive trail. The fountain's current condition is not working, and it is missing some finish stone along the basin edges, but overall the masonry condition of the base and skirting is stable.

An outdoor fireplace (Feature 3) may have also been built for later park use because its function within the CCC camp is not documented or seen in any photos. However, it is very similar to outdoor fireplaces found as part of picnic units built by the CCC at Abilene State Park (Figure 12). Feature 13 appears to be of the type of outdoor fireplace referred to as an Informal Raised Hearth Type (Figure 13) as defined in *Camp Stoves and Fireplaces*, a design guide for national forests and other outdoor recreation use (Taylor 1937:37).

One of the most intriguing features recorded during the survey was a shallow concrete-lined pond (Feature 12). This was a shallow (< 1-m deep) semicircular depression measuring approximately 20-22 m across. It was constructed of concrete, with limestone



Figure 12. Photograph of CCC fireplace at Abilene State Park.

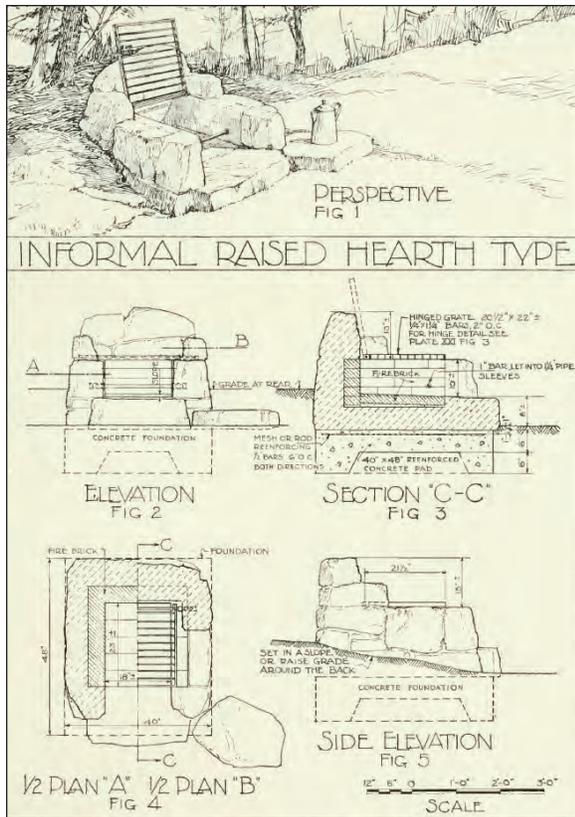


Figure 13. Schematic of informal raised hearth type (Taylor 1937:37).

and fossilized wood edging and concrete (or possibly plaster) lining the majority of the feature. It also contained several iron pipes and probably a drain box at its lowest elevation. There are several entries in the historic documents mentioning a fish pond. The first appears in the March 13, 1936 issue of the camp newsletter, the Cedar Braker (TPWD 2019b) and states that “Bill Bishop, leader who oversees the building of the Fish Pond and Rockery, stated that the concrete had been poured in the Fish Pond. Tow tons of flagstone and two tons of petrified rock have been hauled from Ft. Worth for the construction of the Rockery and Fish Pond” (TPWD 2019b). The 24 July 1936 edition of the camp newsletter mentions that “the camp has taken on a homelike appearance with... flowers and shrubs, fish pond, and

a homemade cage for the most beloved pets of the company, four squirrels” (TPWD 2019b). Another edition, on 07 August 1936, mentions that the fish pond was cleaned out then refilled and stocked with minnows to help prevent mosquitoes from breeding (TPWD 2019b).

The details of these descriptions were not available during the background research prior to the survey but have been very useful in confirming the nature of this interesting feature. This feature is likely the fish pond mentioned in camp documents, but it is unclear if it was constructed for CCC camp use only, intended as a permanent park recreational feature, or possibly associated with the nearby CCC constructed Caretaker’s Cottage (now superintendent’s house). The rockery mentioned in the newsletter refers to a design feature like a rock garden. The survey did not encounter additional free-standing features described as such, but future clearing of the dense vegetation surrounding the pond may allow discovery of rock-lined garden planters. TPWD staff will likely investigate this further. During the survey, leaf and debris found in the pond basin was mostly left in place in order to protect the concrete or plaster lining and other potential features until a more detailed conservation plan can be developed. Additional natural resources surveys may be necessary to determine if any plants in the area could be related to the flowers, shrubs and roses mentioned in the camp newsletters.

The survey recorded the camp’s incinerator (Feature 16), a substantial masonry constructed and brick-lined structure with metal framed grates covering the open top. It had air vents or flues on one end that could have served as drains or clean outs as well. This feature was still in use after the CCC camp was removed and probably served the

park until the past decade or so, as evidenced by the debris in and near the incinerator. Due to the location of this feature near the park residence, it is not being considered for public access and will not likely be on the planned interpretive trail.

The current survey also noted two raised mounds in the mowed field between the headquarters and treeline. There were no obvious structural remains (i.e., foundations) or artifacts. It is possible these are the remnants of the planned golf course as mentioned in several documents, either as part of a course for public recreation or for the private use of the CCC men only. The previous geoarcheological examination of the soils in the area that comprise these mounds indicated that they are of historic age; however, their origin could not be ascertained by geoarcheological investigations alone (Ralph et al. 1998:104). Historic records including the Cedar Braker camp newsletter, indicated that the CCC workmen had a 4-hole golf course (TPWD 2019b). It is possible that the two mounded areas in the open grassy area west of the thicket are man-made features (possibly the putting greens) for a golf course, either under construction for permanent recreation or for the CCC boys' enjoyment only, or both.

The water tower, also known as the pumphouse, was not described as part of this survey. It is maintained as a standing historic structure (Freeman 2009). It is within a secure fenced area in the maintenance yard, and outside of the public use portions of the park. Therefore, it is difficult to add as an interpretive feature unless the trail can be planned to have a location for viewing of the prominent upper part of the water tower without hindering park maintenance operations. The pedestrian survey recorded a concrete block (originally described as a pier) within the maintenance yard. Its

function is unknown but may have served as an anchor for guy wires to a radio tower or associated with water tank stands prior to the construction of the current pumphouse/water tower.

Oral histories describe the camp layout with four to six barracks aligned perpendicular to the camp path, known as Barracks Row. This was described with the flagpole at one end and the camp bathhouse at the opposite end of the row (Vetter 2000: 32, 103). The flagpole is an iconic feature of military and civilian facilities. The staff at the park have been intrigued by (and searching intently for) the camp flagpole. The archeological survey did not find definitive evidence of a flagpole, but two separate features (Features 10 and 14) described as concrete blocks were located and mapped within the general area of the camp determined to be at the opposite end of Barracks Row from the bathhouse location. It is possible that one of these represents part of the flagpole base, however, based on visual comparison it is undetermined if either of these features match photos of the flagpole from the archives mostly due to the lack of detail at the base of the flagpole in the photos (Figure 14). These two concrete block features (a pedestal and formed box) may also be related to a gate or utility pole support dating to the CCC camp or later maintenance area.

A general scatter of historic artifacts was observed within the central portion of the survey area, with some clusters being noted. As noted in the methods section, collection of items was limited to those that were deemed as potential for being picked up by park visitors, were unique or of personal nature and could be further studied or were in need of protection or condition assessment for permanent curation. However, no artifacts were collected during this project.



Figure 14. Photograph of flagpole at Camp SP-53-T ca. 1936 (TPWD 2019b).

CONCLUSION

Archeological investigations have confirmed that CCC workmen, and later state park staff, were able to effectively remove above ground camp buildings leaving concrete foundations, construction debris scatters and piles, utility and trash pits, and a relatively small number of artifacts concentrated around the barracks and technical buildings. The growth of privet, juniper, and other understory plants at the park has heavily encroached into the CCC camp area. The dense vegetation also obscures the view across this section of the park which is now very different than the open camp area shown in CCC era photographs.

A CCC inventory for Camp SP-53-T from 17 April 1939, (NPS 1934-1939) indicates that the park had 28 structure which include 6 barracks, a bathhouse/latrine, a mess hall, 6 educational buildings, and 13 technical

buildings (see Table 1). The archeological survey was able to identify the bathhouse/latrine and the water tower which was classified as a technical building. Technical buildings include garages, workshops, pumphouses, and light plants. The water tower is maintained and protected as part of the current maintenance area. The numerous small concrete slabs have been identified as pads for small technical buildings or parts of the numerous pier and beam buildings in the camp (e.g., barracks). At other CCC camps, concrete slabs were most often used for technical buildings while barracks, mess halls, recreational, and educational buildings were of pier and beam construction. Photographs from SP-53-T and the lack of remaining concrete foundations indicate that pier and beam constructions was more prevalent at the park, as also evident in the historic photos of the camp, or that additional concrete foundations

are obscured or buried due to the dense understory plants and surface duff.

An interpretive trail is envisioned by park and regional staff to include an accessible trail created by mowing a path through the grass and hand clearing privet, cedar branches and shrubs. The trail, as currently planned, will include stops and signage to highlight the history and specific details of the camp and create points of interest in addition to the park's well known dam and lake. If additional buried concrete foundations are discovered during future brush removal and trail construction, the park will be required to reroute the trail to avoid any direct impacts to CCC structures or other cultural resources.

Archeological site 41JN19, the location of the CCC camp where these men lived, has been recorded and is considered eligible for inclusion on the NRHP under Criterion A, due to being associated with an event of both state and national significance. Due to unconfirmed details regarding certain features, such as the pond, fireplace and potential golf course, there is the possibility that future research and archeological investigations may be able to elicit a more complete story of the history of the camp. Therefore, it is currently believed that the site has the potential to provide additional knowledge beyond that which is textually documented and therefore is eligible under NRHP Criterion D and warrants nomination as an SAL.

Additional tasks that TPWD archeologists are pursuing include a revised entry to the THC Sites Atlas and to request formal determination of SAL eligibility for 41JN19. Additional operational needs related to this project will fall to the park staff with assistance from the Cultural Resources Program and other specialists at TPWD to include the construction of an interpretive

trail, as outlined during advanced planning (see Figure 2), to include interpretive signs and markers. Future research may delve into the wealth of available archival resources. A more thorough reconstruction of camp life could be achieved in the future through these valuable sources. For example, beyond the construction of the dam and park infrastructure, CCC officers at the park developed manuals and safety courses to instruct enrollees. These independent efforts were met with a lukewarm reception from the NPS who requested that all teaching materials developed at the CCC camps be vetted by the NPS. Copies of the draft manuals (Hand Tools: Course of Instruction as Prepared and Taught at Cleburne SP 53-T, Cleburne Texas) were preserved in the CCC records in Denver and include many photographs of CCC enrollees at work including instructions on tool use and safety illustrated with photographs of incorrect and correct use of tools.

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ARCHEOLOGICAL INVESTIGATIONS FOR A SEPTIC TANK REPLACEMENT AND SEPTIC LEACH FIELD INSTALLATION AT COLORADO BEND STATE PARK, SAN SABA AND LAMPASAS COUNTIES

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ABSTRACT

Texas Parks and Wildlife Department is proposing to replace an existing septic tank with a new tank and install a septic leach field at Colorado Bend State Park. The proposed project area is within multicomponent prehistoric and historic site 41SS40. Fieldwork consisted of a surface inspection augmented by the excavation of two shovel tests; the shovel test results indicate that the project area is in a highly disturbed and relatively low density part of the site. Texas Parks and Wildlife Department recommends that a professional archeologist be present to monitor ground disturbing activities to document any features or intact deposits that may be encountered.

INTRODUCTION

In March 2018, Texas Parks and Wildlife Department (TPWD) Cultural Resources Program Staff conducted surface inspection and shovel testing at Colorado Bend State Park in San Saba County (Figure 1). TPWD proposes to replace an existing septic tank with a new tank and install a septic leach field. No new ground disturbing impacts are anticipated for the tank replacement component of the project; however, new ground disturbing impacts will include the leach field installation and new utility lines from the septic tank to the leach field. The area to be impacted measures approximately 40-m long and 25-m wide, or 0.2 ac (Figure 2). The maximum depth of disturbance is expected to be 2 m for the tank installation.

ENVIRONMENTAL BACKGROUND

Colorado Bend State Park is located on the south edge of the Great Plains Physiographic Province, in the Llano district of the Central

Texas section (Fenneman 1931:9, 58-59). Rolling uplands comprise the landscape of most of the park, with broad areas of exposed limestone bedrock, cobbles, and boulders. The topography is characteristic of a karst area, where dissolution of the rock has formed hundreds of fissures, sinkholes, and caves (Bates and Jackson 1984:280). Minor drainages have incised deep canyons with steep gradients as they approach the Colorado River. The river is confined to a deep narrow canyon that is approximately 150-m wide in the northern one-third of the park. Along that stretch, a typical cross-section of the bank along the west side of the river below the vertical canyon wall includes an active floodplain, an alluvial terrace, and a colluvial bench; each of the three landforms averages 5-10-m wide. Along the southern two-thirds of the section of the river that flows through the park, the canyon generally widens to about 200-250 m, the floodplain and terrace each range 15-50-m wide, and the west edge of the canyon is a steep rocky

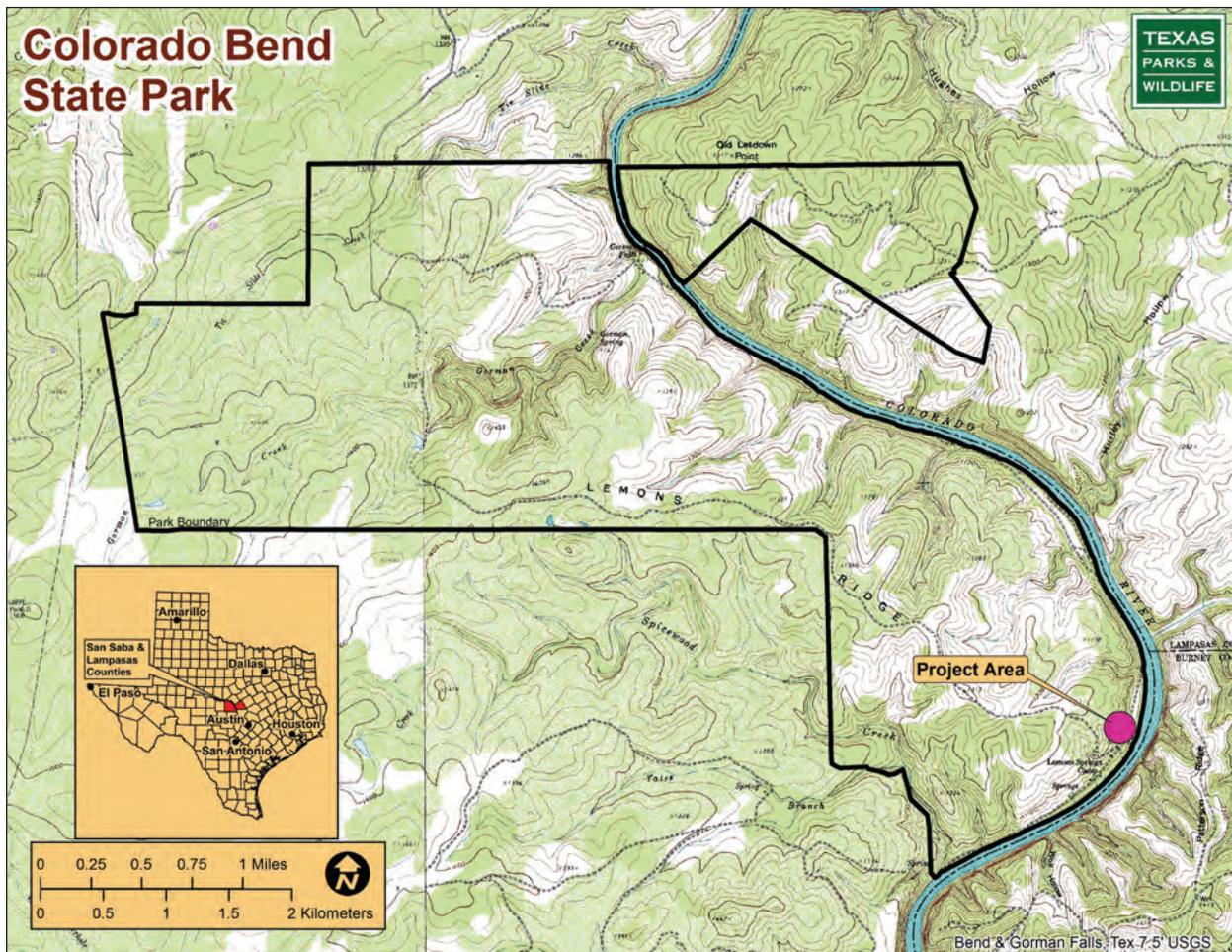


Figure 1. Sections of *Bend* and *Gorman Falls* USGS 7.5' topographic quadrangles depicting location of project area.

slope rather than a vertical wall. Elevations in the park range from 305 m along the river to 440 m in the west part.

Soils in the park consist almost entirely of well-drained, shallow stony clays and clay loams on the uplands, with deeper soils in terrace deposits. The Eckrant-Rock Outcrop association covers approximately 50% of the park in a broad band adjoining the west side of the river, and the entire park on the east side of the river. Eckrant soils are very shallow, very stony clays with a maximum depth of 20 cm. Limestone rock outcrops comprise 10-50% of this association. The west half of

the park contains well-drained, very stony clay loams and clays of the Roughcreek soil map unit, with a maximum depth of 46 cm (Natural Resources Conservation Service [NRCS] 2019). Three pockets of the Speck-Cho complex occur along the south boundary in the west part of the park. These shallow clay loams and loams are well drained and up to 38-cm deep (NRCS 2019). A band of Rumble gravelly clay loam is located near the southwest corner of the park, on the south side of Spicewood Creek. This soil is well drained and reaches a maximum depth of 69 cm (NRCS 2019). The deepest soils in the park have formed on terraces along the Colorado

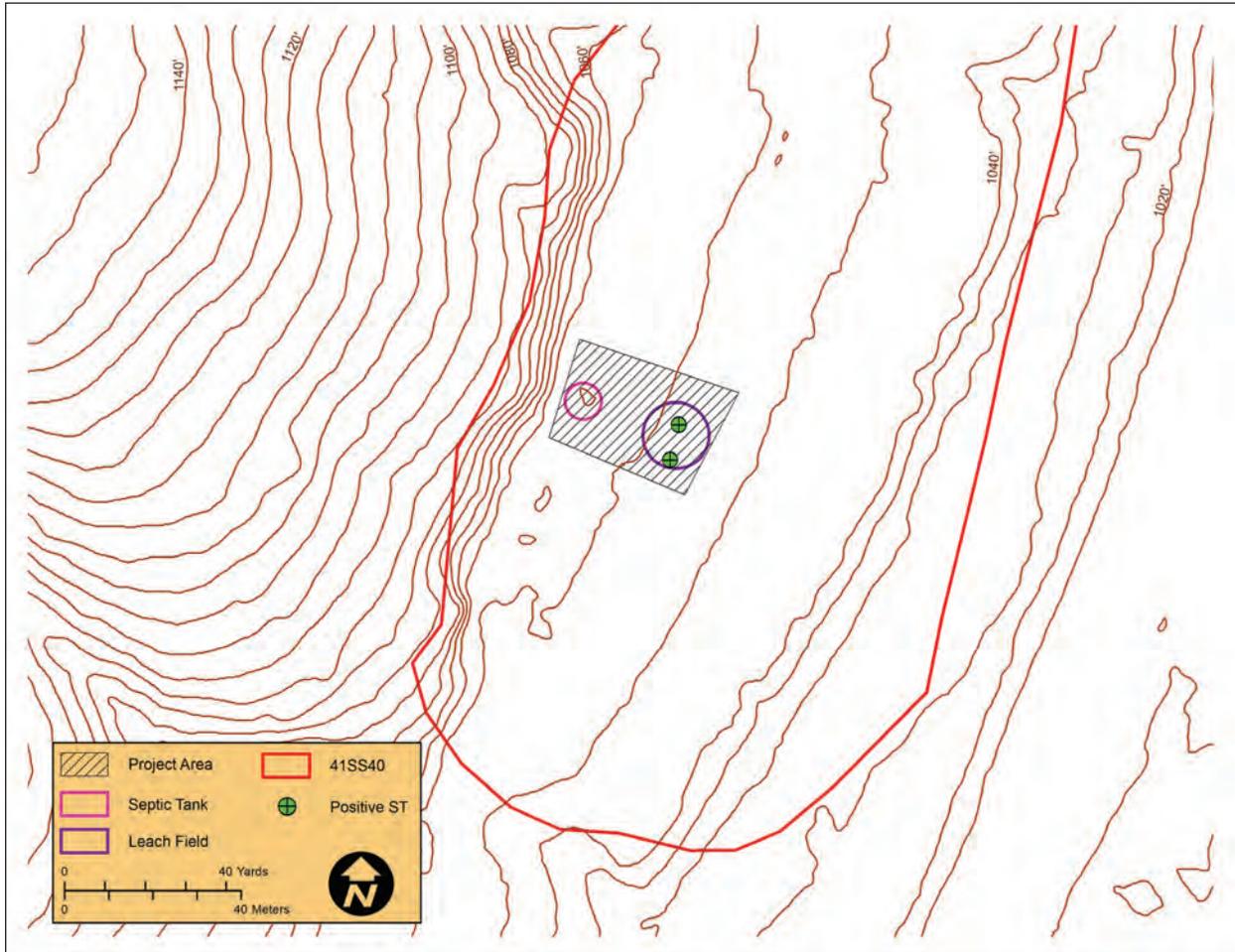


Figure 2. Project area details and archeological site 41SS40.

River. This Westola map unit is composed of fine sandy loam, loam, clay loam, loamy fine sand, and silty clay loam and attains depths up to 165 cm. Westola soils are well drained and are briefly inundated by floods at least once each year (NRCS 2019).

Colorado Bend State Park is located on the northeast edge of the Llano Uplift, a geological feature caused by the structural uplift of Precambrian metamorphic and igneous rocks (Sellards et al. 1932:29-31). Erosion of the overlying Paleozoic and Cretaceous strata has exposed these older rocks and created a topographic low called

the Llano Basin. Around the edges of the basin are lower Paleozoic rocks which dip outward beneath the Cretaceous rocks of the Edwards Plateau that surround most of the basin (Sellards et al. 1932:30).

Bedrock in the park consists of limestones and dolomites of the Paleozoic Lower Ordovician Ellenburger Group (Barnes 1976). The Gorman Formation underlies most of the central and southern part of the park, the Honeycut Formation occurs in the western third, and the Tanyard Formation is found in the southeast corner. All three formations have strata that contain chert

nodules (Barnes 1954:6-8). Quaternary alluvial deposits of sand, silt, clay, and gravel comprise the terraces along the Colorado River (Barnes 1976).

Chert resources in the park occur in two distinct locales. In the uplands, white to gray chert nodules have eroded out of the Ellenburger limestones and are scattered over broad areas. This chert is so highly fractured that most of it is not suitable for knapping. Cobbles from gravel bars along the Colorado River were the primary source of chert for the chipped stone artifacts found in the park. The river drains a vast area upstream from the park and crosses several chert-bearing formations. These range in age from the Pennsylvanian Marble Falls Formation to the Lower Cretaceous Travis Peak and Edwards Limestone Formations (Barnes 1976), and the specific sources of riverine cobbles cannot be identified without extensive petrographic analyses (Banks 1990:59-60). Small chert pebbles also are found inside Gorman Cave, a residual from an early period in the cave's development when it was filled by gravels and ceiling spalls (Reddell 1973:54). The probable source of raw materials for grinding stones is located 15-20 km south of the park where granites and sandstones outcrop in the center of the Llano Basin.

CULTURAL BACKGROUND

The first recorded archeological investigation in the area that is now Colorado Bend State Park was conducted in 1978 by Darrell Creel, for the Natural Areas Survey program of the Lyndon Baines Johnson School of Public Affairs at The University of Texas at Austin (Creel 1978a). He surveyed 2.6 square km in the area around Gorman Falls, and recorded seven prehistoric sites (41SS29 - 41SS35) consisting of a campsite with two burned

rock middens, two lithic scatters, four rockshelters with midden deposits, and one rockshelter with a pictograph (Creel 1978a:8-10). At site 41SS29, Creel observed materials buried 1-2-m deep in the wall of a borrow pit and recent potholes in the two burned rock middens (Creel 1978a:8).

After the 712 ac Gorman Falls tract was acquired by TPWD, staff archeologist Ron Ralph conducted a reconnaissance of the river terraces from Gorman Falls to Gorman Cave in June 1985 (Ralph 1997:60). He also inspected the road from the entrance of the tract to Gorman Falls, noting that the road fill contained artifacts, mussel shells, and travertine-encrusted snail shells (Ralph 1997:60). The road fill came from a borrow pit at site 41SS29, where Ralph observed three thin cultural strata in the north wall containing chipped stone debitage, mussel shells, burned rocks, and charcoal (Ralph 1985a; 1985b; 1997:60). In July 1985, Ralph and TPWD biologist Raymond Neck mapped the borrow pit and drew a stratigraphic profile of an 8-m wide and 5-m deep section of the wall in the northwest corner (Figure 2). They noted darker-stained probable cultural strata at approximately 20, 150, and 225 cm below surface, and collected snail shells from several strata (Ralph 1985a; 1997:60-61). Ralph recommended that site 41SS29 be extensively tested prior to any ground-disturbing activities.

After an additional 4,616 ac of the former Lemons Ranch were acquired by TPWD in 1987, staff archeologists J. David Ing and Mike Davis made three trips to conduct a reconnaissance-level survey of river terraces that might be impacted by development (Davis and Ing 1987:1). They recorded one burned rock midden with a large pothole in it (41SS39), and four scatters of lithic debitage, mussel shells, and burned rocks

(41SS40-41SS43). A private collection of artifacts from site 41SS43 was photographed, including projectile points ranging in age from the Early Archaic to Late Prehistoric periods. Assistance from local informants enabled Ing and Davis to record four historic sites on the uplands (41SS44 - 41SS47): two mines, a cemetery, and a temporary community and store (Davis and Ing 1987:3). Recommendations for further work included detailed mapping of the existing cultural features of the former Lemons fishing camp, and archeological excavations of the terraces by hand and machine prior to any ground disturbance or development (Davis and Ing 1987:4-5).

In 1989, Mike Davis surveyed a proposed hiking trail loop that was to begin at the mouth of Spicewood Creek, head upstream for about 800 m, turn northeast across Lemons Ridge to a proposed primitive campground, then head down the Colorado River to the mouth of the creek (Davis 1989). Shovel testing of a terrace on Spicewood Creek revealed buried cultural deposits which were recorded as site 41SS66. The proposed campground was to be located on a terrace of the Colorado River just north of previously recorded site 41SS43, and the proposed trail would cross that site as well as sites 41SS40, 41SS41, and 41SS42. Because visitors had collected the exposed artifacts at these sites over many years and the proposed pedestrian traffic would not disturb buried deposits, Davis (1989) noted that none of the proposed development activities would impact cultural resources. He also inspected three trash dumps but did not observe any historic artifacts or cultural deposits.

In January 1990, TPWD archeologists Andy Cloud, Debra Beene, and Andrea Brand surveyed a 240 ac tract that was scheduled

for cedar (*Juniperus ashei*) clearing and burning on the uplands in the north part of the Gorman Falls tract. They traversed the area on transects spaced at 30 m intervals, and recorded prehistoric sites 41SS69-41SS72, consisting of a burned rock midden, two lithic scatters, and a sinkhole/cave (Cloud 1990). A small test was dug by trowel in the burned rock midden. A small cave at one end of the sinkhole had been explored and mapped by cave explorers who named it Gorman Sink (Reddell 1973:59-60). In 1990, the archeologists observed two chert flakes outside the sinkhole but saw no artifacts inside the cave. The sites were flagged temporarily to prevent cedar clearing and burning from impacting them (Cloud 1990:4).

In May 1991, while conducting an archeological workshop at the park, TPWD archeologist Ron Ralph discovered recent unauthorized excavations in the burned rock midden at site 41SS39 (Ralph 1991a). Ralph reinspected the site in December 1991 and did not find further looting but noted significant disturbance from rooting by feral hogs (Ralph 1991b). Ralph made six recommendations: 1) remove feral hogs from the vicinity; 2) re-record, map, and photograph the site; 3) cover the burned rock midden with dead wood to prevent further disturbance; 4) instruct park personnel to closely monitor the site; 5) conduct monthly inspections by an archeologist for one year; and 6) if the above measures did not provide adequate protection, erect a barbed wire fence with signs around the site (Ralph 1991b).

In July 1992, Ralph dug a 130 cm deep shovel test on the flood plain of the Colorado River below Gorman Falls to assess the impact of construction of a proposed observation deck at that location (Ralph 1992). The shovel test encountered layers of silt and fine

sand with no cultural materials, and Ralph recommended that construction be allowed to proceed. The Texas Historical Commission (THC) concurred by letter of 30 July 1992.

In January and February 1995, TPWD Regional Resources Coordinator Clay Brewer and Colorado Bend State Park Manager Robert Basse assessed and monitored five road and culvert projects (Brewer and Basse 1996a). Four of the projects were located on the river terraces encompassing the former Lemons Fishing Camp and previously recorded site 41SS40. Base material was used for road construction on the archeological site to avoid ground disturbance, and ground disturbance on off-site areas was restricted to existing trenches and/or the floodplain. The fifth project involved filling and widening the existing road crossing of upper Gorman Creek, and did not require ground disturbance (Brewer and Basse 1996a:304).

In February 1995, SWCA Environmental Consultants of Austin, Texas conducted archeological monitoring of a 5.5 m long backhoe trench on an alluvial terrace of the Colorado River, below the bluff where site 41SS29 is located (Miller 1995a). The purpose of the trench was to expose a telephone cable that had been buried about 1 m below surface, so only a small section of the new trench encountered undisturbed deposits. The trench exposed a 40-cm thick colluvial zone of silty clay and weathered limestone overlying a 60-cm thick alluvial deposit of sand; no cultural materials were observed (Miller 1995a:2). In August 1995, SWCA monitored excavation of a 4 x 4 m backhoe trench and a 20-m long trench at the same location (Miller 1995b:3). Both trenches were excavated to a depth of about 1 m; undisturbed deposits consisted of a 30 cm thick colluvial zone of sandy clay loam with weathered limestone, overlying three alternating alluvial and colluvial zones of

silty clay loams and sandy loams. No cultural materials were encountered.

In September 1995, two construction projects of less than an acre each were monitored (Brewer and Basse 1996b). A campsite for a park host/ranger was installed on site 41SS29, in an area that had been disturbed by a commercial fishing camp prior to acquisition by TPWD. No cultural resources were encountered (Brewer and Basse 1996b:306). Another park host/ranger campsite was built near the south end of site 41SS40, in an area that had been previously disturbed by the former Lemons Fishing Camp. During backhoe excavation of a 15-m long trench for utility lines, the top of a 5-m long burned rock midden was uncovered about 30-40 cm below surface. Excavation was terminated and the Cultural Resources Program at the TPWD was notified (Basse 1995). After the midden was documented with photographs, the trench was backfilled (Brewer and Basse 1996b).

In the fall of 1995, park personnel found a chert biface in Cicurina Cave while leading a group of park visitors through the cave. The cave is located outside the 1996 survey area, and the biface probably washed into the cave (McNatt 1996:1, 3). This biface is the only prehistoric artifact recovered from a cave in Colorado Bend State Park prior to the 1996 survey.

In February, March, and June of 1996, the TPWD Archeology Survey Team conducted pedestrian archeological surveys on two tracts covering a total of 3,021 ac and comprising approximately 57% of Colorado Bend State Park (McNatt et al. 2001). Thirty-nine archeological sites were examined during the 1996 investigations. Twenty-one archeological sites (41SS29 - 41SS35, 41SS39 - 41SS47, 41SS66, and 41SS69 - 41SS72) had been recorded during previous

investigations between 1978 and 1990. In 1996, 18 new sites were recorded: 41SS139 - 41SS156. Twenty-five of the 39 sites date to the prehistoric period, 11 sites date to the historic period, and 3 sites have both prehistoric and historic components. Most of the prehistoric sites that can be dated were occupied primarily during the Archaic period, with limited evidence of use during the Late Prehistoric period. The historic components consist of evidence representing limited late-nineteenth century and extensive early and mid-twentieth century occupations.

In May 2009, SWCA Environmental Consultants of Austin, Texas conducted an intensive cultural resources survey of 1,125 ac. The investigations covered two parcels within the park, the 600 ac Northern Tract located on the east side of the Colorado River and the 525 ac Southern Tract located on the west side of the Colorado River (Lawrence et al. 2009). The field investigations documented 18 new archeological sites (41SS168 – 41SS174 and 41LM63 – 41LM73) and examined three previously recorded sites (41SS45, 41SS145 and 41SS151). The newly recorded sites consist of prehistoric campsites, rockshelters, river terrace sites, and lithic scatters while the newly identified historic sites are mainly campsites related to late nineteenth to middle twentieth century cedar chopping and ranching industries (Lawrence et al. 2009).

METHODS

Prior to initiation of the field investigations, a comprehensive review of all available archeological reports and databases was conducted to identify and characterize cultural resources known to occur in the vicinity of the project area. At least in part, the compilation of known cultural resources in Colorado Bend State Park is based on the Texas Archeological Sites Atlas, Texas

Historic Sites Atlas, and THC and TPWD map files. In addition, the literature and archival review researched the Geologic Atlas of Texas (Barnes 1974) and Natural Resources Conservation Service soil surveys (Barnes 1974; NRCS 2019).

The fieldwork consisted of a 100% surface inspection of the 0.2 ac project area, augmented by the excavation of two shovel tests (Figure 2). These 35-cm ø shovel tests were excavated in 10 cm levels while deposits from these tests were screened through ¼" hardware cloth. Each shovel test was excavated to a maximum depth of 100 cm below ground surface. All shovel tests were mapped with a Trimble GeoXT GPS unit, WAAS-enabled, with sub-meter accuracy.

RESULTS

A total of two shovel tests was excavated within the project area (Figure 2). Shovel Test 1 was excavated through silt loam to a depth of 100 cm below surface. Five pieces of debitage and nineteen mussel shell fragments were collected at 30-100 cm below surface (Table 1). Shovel Test 2 was excavated through silt loam and clay loam to a depth of 100 cm below surface (Table 1). Three mussel shell fragments and one piece of debitage were collected at 40-100 cm below surface. These artifacts were attributed to the previously recorded site 41SS40. The site has been previously impacted by erosion, facilities construction and use, construction of underground septic and electrical systems, camping activities, and extensive surface collection while operating as a private fishing camp. Although the extent of disturbance to the prehistoric component could not be adequately assessed by the limited shovel testing conducted in 1996 and 2018, the integrity of the historic component is judged to be 30% or less (McNatt et al. 2001:102-105, 202).

Table 1. Shovel test results.

Shovel Test	Level	Depth (cm)	Debitage Count	Mussel Shell frags.	Soil Description
ST1	1	0-10	0	0	Silt Loam (5YR4/3); granular; some CaCO ₃ , quantities increase with depth; pebbles, roots, insects; rodent burrow likely along NW side of test where matrix is finely sorted and easy to excavate, artifacts may be originating from this area
	2	10-20	0	0	
	3	20-30	0	1	
	4	30-40	0	2	
	5	40-50	0	1	
	6	50-60	0	0	
	7	60-70	0	0	
	8	70-80	1	5	
	9	80-90	2	2	
	10	90-100	2	4	
ST2	1	0-10	0	0	Silt Loam (7.5YR4/3), granular; roots, burned tree root; insects; abrupt boundary
	2	10-20	0	0	Clay Loam (5YR4/4); granular; many mottles; CaCO ₃ common; burned tree root; burrowing insects; limestone cobbles
	3	20-30	0	0	
	4	30-40	0	1	
	5	40-50	0	0	
	6	50-60	0	0	
	7	60-70	0	0	
	8	70-80	0	0	
	9	80-90	0	0	
	10	90-100	0	1	

CONCLUSION

The proposed septic tank replacement will occur within existing utility footprints, while the septic leach field is a new utility feature but will be located in areas previously disturbed by construction and recreation activities. Previous utility upgrades in site 41SS40 were approved by the THC in August 1996. It is unlikely that the septic leach field installation will adversely affect the remaining cultural deposits. The TPWD Cultural Resources Program therefore recommended that the proposed project be allowed to proceed without further cultural resources investigations. THC concurrence for this project was received in May 2018.

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PROPOSED SURFACE REHABILITATION AND DRAINAGE IMPROVEMENTS OF SELECTED SEGMENTS OF THE JOE JOHNSTON ROUTE TRAIL AT GOVERNMENT CANYON STATE NATURAL AREA, BEXAR AND MEDINA COUNTIES

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ABSTRACT

Texas Parks and Wildlife Department proposes to rehabilitate the surface tread and improve the drainage of selected segments of the Joe Johnston Route Trail at Government Canyon State Natural Area in Bexar County. A total of 448 m of trail measuring 3-m wide will be addressed, totaling approximately 0.3 ac. These proposed repairs will partially occur within the boundaries of six known archeological sites (41BX140, 41BX142, 41BX146-148, and 41BX1496). Ground surface impacts beyond the existing trail/road footprint are proposed for non-SAL eligible sites 41BX147 and 41BX148 while no ground disturbing impacts beyond the existing trail/road footprint will be permitted within the remainder of the sites (41BX140, 41BX142, 41BX146, and 41BX1496) due to SAL eligibility and resource sensitivity. Cultural resources monitoring will be conducted in any areas where subsurface excavation is required near or within known archeological sites.

INTRODUCTION

The Texas Parks and Wildlife Department (TPWD) proposes to stabilize and improve the surface tread and drainage of selected segments of the Joe Johnston Route Trail (JJR) at Government Canyon State Natural Area (GCSNA) (Figure 1). Due to erosion and pedestrian and vehicle traffic the JJR has segments of unstable and loose, rocky trail surfaces that require stabilization and improvement to address access and visitor health and safety concerns. A total of 448 m of trail measuring 3-m wide will be addressed, totaling approximately 0.3 ac. Construction will be on land owned by TPWD and will be funded by TPWD and private donations while all work will be conducted by a private contractor. Elements of the proposed project will occur within the boundaries of six known archeological sites and therefore required

review by the Texas Historical Commission (THC) under the Antiquities Code of Texas.

The proposed project will specifically address creek crossing ingress/egress areas where steep grades and vehicular traffic have created an unstable, loose, and rocky trail/road surface (Figures 2 and 3). Additionally, locations were selected for the installation of drainage features to minimize the volume of water flow contributing to severe erosion of the trail tread. The proposed solution(s) includes filling eroded segments with packed road base to return the trail tread to grade to eliminate cupped cross-sections (Figures 2 and 3). Following the road base, a layer of geo-grid/grass paver (product similar to NDS EZ-Roll or Invisible Structures Slopetame2) will be anchored to the compacted base material followed by a final layer of compacted road base to cover the pavers.

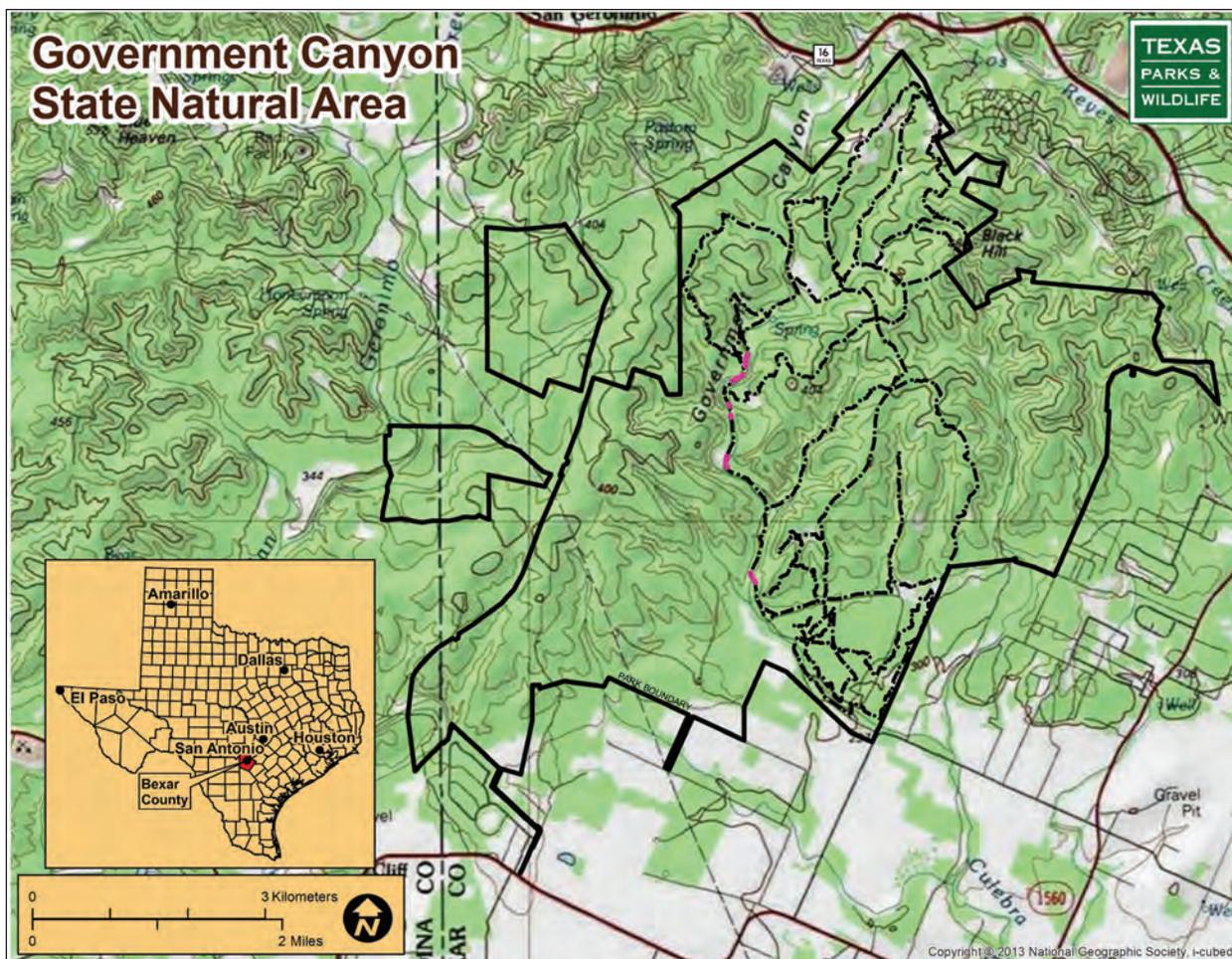


Figure 1. Section of USGS topographic quadrangle depicting location of project area (pink lines).

The geo-grid material is required to anchor the final course and prevent its erosion. In some areas, the tread height differential is great enough that a retaining wall will be required on the down slope side to properly level the tread and prevent erosion. The retaining walls will be constructed of dry stacked native limestone, while height and length will vary depending on the segment proposed for repair. Trail tread rehabilitation will occur within 10 segments that vary in length and treatment (Table 1).

To maintain these improvements over time, TPWD proposes to install at least one rolling grade dip uphill from each improved segment. These water drainage features

will be installed along the trail in selected places to divert water from the trail tread to minimize erosion and to reduce terminally muddy areas (Figures 4 and 5). Two types of rolling grade dips will be utilized: daylighted drains and basin drains. The main consideration when constructing such a grade dip is that the drain must be able to empty into open space below the tread surface. Unfortunately, there are many sections of the JJR that have become highly eroded and compacted over time, and it would be too considerable an undertaking to daylight a drain. An alternative option for these areas would be the construction of a rolling grade dip that drains into a basin, a



Figure 2. Eroded segment of Joe Johnston Route Trail.

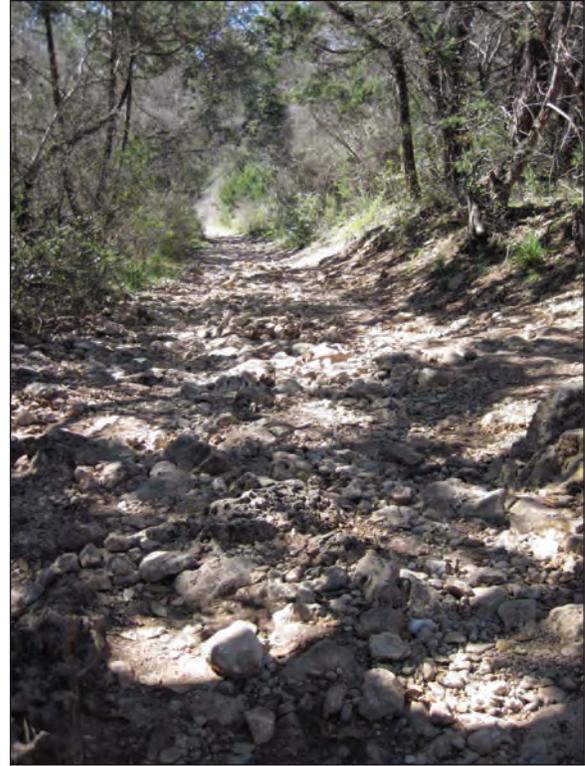


Figure 3. Another eroded segment of Joe Johnston Route Trail.

constructed depression that is lower than the trail tread but does not daylight. Rather than run off, the basin collects rain water and the associated sediment.

CULTURAL BACKGROUND

Prior to a 1996 survey by TPWD (McNatt et al. 2000), 52 sites had been recorded in GCSNA. Forty-eight of the sites were recorded prior to establishment of the state natural area in 1994, most during archeological surveys in anticipation of proposed development and/or sale of the former San Antonio Ranch. GCSNA now encompasses all of the former 8,348 ac ranch.

In 1972, the Texas Archeological Salvage Project of The University of Texas at Austin conducted a brief archeological reconnaissance of selected areas of the

San Antonio Ranch (Dillehay 1972). The reconnaissance focused on canyon bottoms and adjacent lower slopes, including Government Canyon and two unnamed drainages. Two canyons slated for development northeast of the current state natural area also were inspected (Dillehay 1972:3). Forty prehistoric sites were recorded (41BX130-41BX169), including 30 sites (41BX130-41BX151, 41BX162-41BX169) in the present state natural area. Based on diagnostic projectile points collected from the surface, 11 of the 30 sites had datable components: one site was Early Archaic; one was Early and Late Archaic; one was Middle Archaic; six were Late Archaic; two were unspecified Archaic; and one was Late Prehistoric (Dillehay 1972:34). Twelve of the 30 sites had surficial or very shallow cultural deposits and were not recommended for

Table 1. Details of selected trail segments slated for rehabilitation.

Segment	Segment Length (ft)	Details
1	177	Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
2	193	will require a retaining wall roughly 60 cm in height on the downslope side; Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
3	275	Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
4	141	Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
5	101	Will require a retaining wall roughly 60 cm in height on the downslope side; Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
6	65	Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
7	190	Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
8	91	Will require a retaining wall roughly 60 cm in height on the lower 14 m of the downslope side; Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
9	114	Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.
10	124	Fill and level with road base; Cover and anchor with geo-grid; Install final course of road base and compact.

further investigations (Dillehay 1972:8). Intensive survey and subsurface testing were recommended for 14 sites (Dillehay 1972:8).

In January 1987, avocational archeologist C. K. Chandler from San Antonio recorded sites 41BX713 and 41BX714 in the north-central part of what is now GCSNA. Chandler's site forms are on file at the Texas Archeological Research Laboratory of The University of Texas at Austin and describe site 41BX713 as two burned rock middens and site 41BX714 as a lithic procurement locality on a hilltop with large numbers of chert nodules, cores, and flakes. Chandler also inspected previously

recorded sites 41BX134 and 41BX139 (Dillehay 1972); his site form for 41BX134 includes a drawing with measurements of a historic house.

In 1991, Geo-Marine conducted an archeological survey of 450 ac of a 1,460 ac tract of the former San Antonio Ranch, then being sold by the Department of Housing and Urban Development (Peter and Hunt 1992:1). Most of the survey tract is now in the northeast corner of GCSNA. Sixteen prehistoric sites (41BX963-41BX978) were recorded, all located within the current state natural area. Thirteen of the sites are lithic

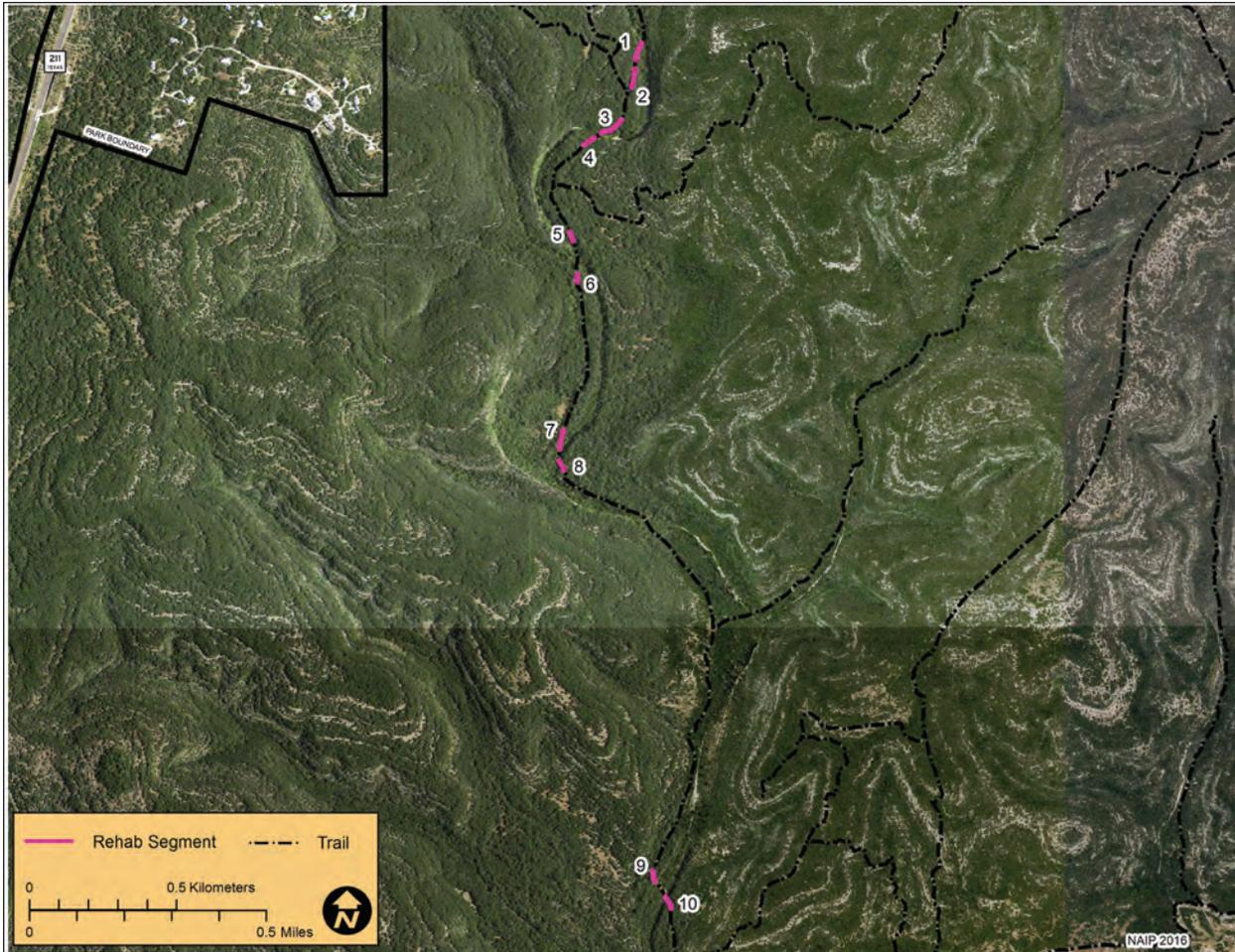


Figure 4. Selected segments of the Joe Johnston Trail Route to be rehabilitated.

scatters and three are quarry sites (Peter and Hunt 1992:55). Three of the sites are located on valley floors, 10 were on slopes, and three are on ridgetops (Peter and Hunt 1992:54). This site distribution may reflect prehistoric use of outcrops of chert beds located 12 to 20 m below the ridgetops (Peter and Hunt 1992:56). Based on the recovery of Guadalupe tools and projectile points, four sites were dated to the Early Archaic, one was Late Archaic and Late Prehistoric, and one was Late Prehistoric (Peter and Hunt 1992:25, 48, 54-55). All of the sites have poor contextual integrity because of their shallow cultural deposits, mixed components, and low potential for subsurface features or

preservation of subsistence data (Peter and Hunt 1992:55). The sites were considered to be ineligible for listing on the National Register of Historic Places, and no further work was recommended (Peter and Hunt 1992:55).

After GCSNA was established in 1994, TPWD Resources Coordinator Ron Ralph recorded one historic site and three prehistoric sites while assisting volunteers with a karst and hydrology study. In September 1994, Ralph recorded the historic stone house and four associated features at prehistoric site 41BX134 as a separate site, the Christian Zizelmann house (41BX1067; Ralph 1995:163-164). The area around the house

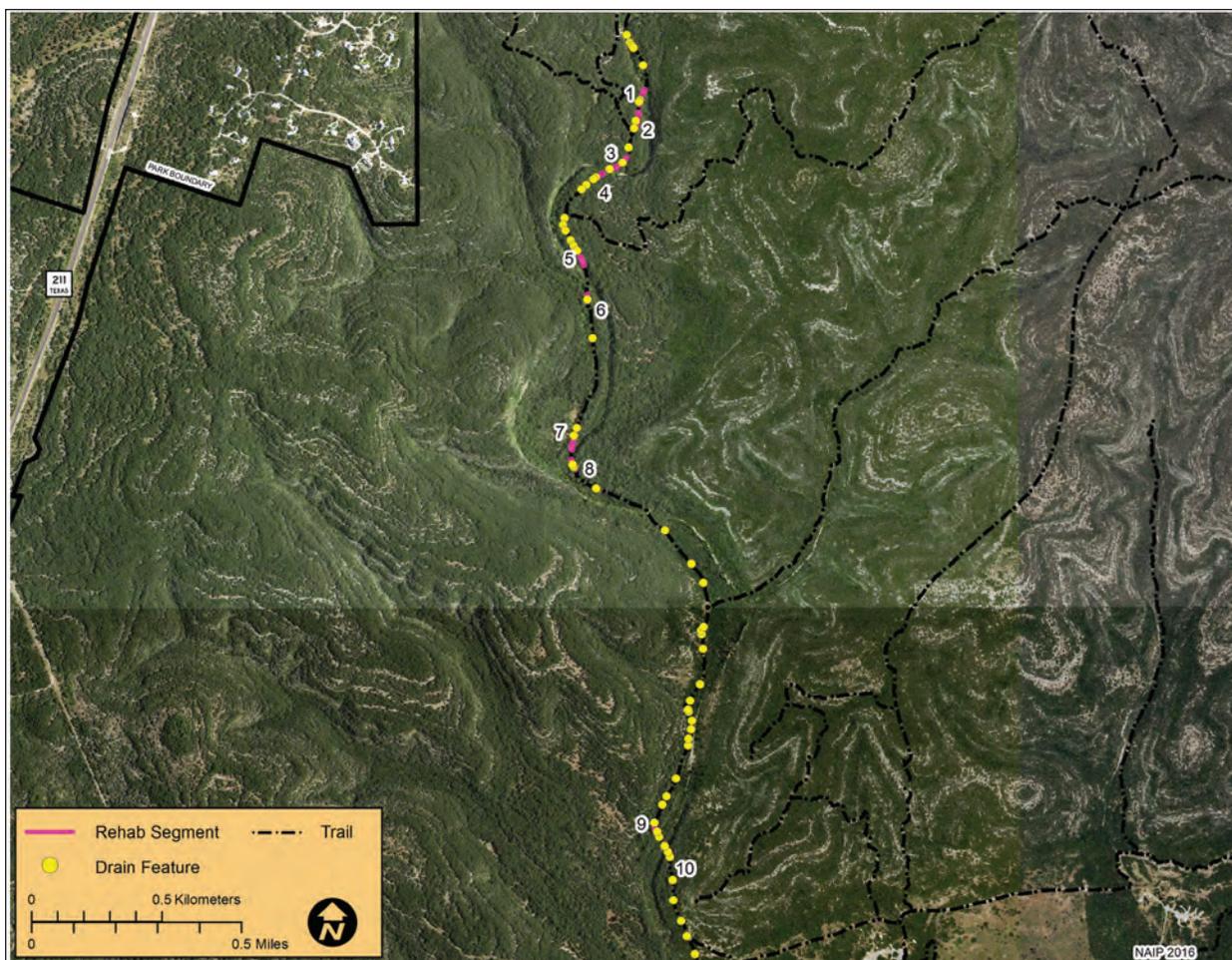


Figure 5. Drainage features in relation to selected trail segments slated for rehabilitation.

was cleared of vegetation, and the house was photographed and mapped during this visit; the other historic features were mapped in November 1994. Recommendations included additional clearing, mapping, and architectural studies and stabilization of the structure (Ralph 1995:165).

In November of 1994, Ralph recorded site 41BX1068, a sinkhole discovered by Texas Speleological Association volunteers who were conducting a karst survey of the state natural area (Ralph 1995:164). The sinkhole was named LAG Cave and is 2-m \varnothing , dropping 1.5 m to a dirt floor (Veni 1994a:6). In November of 1994 TPWD Resources Coordinator Robert Burnett inspected the fill

and saw only deer and goat bones, so he gave permission for hand excavations to ascertain whether the sinkhole opened into a cave (Veni 1994b:4). After about 50 cm of fill had been removed part of a human cranium was revealed. Excavations immediately ceased, and Burnett and Ralph were notified. They collected the human bones that had been disturbed, but no artifacts were observed. The sinkhole was later partially filled with clean sand. In January 1996 the human bones were reinterred in the sand and the sinkhole was filled with rocks; a thin cap of cemented stone rubble was added in December 1996 to protect the remains (Ralph 1997:147).

While assisting with the karst survey in 1995, Ralph revisited previously recorded site 41BX163 and recorded sites 41BX206 and 41BX207 (Ralph 1996). Site 41BX206 was a lithic scatter located on a hilltop with exposed flint nodules, reduced nodules, broken bifaces, and debitage indicating that the site was both a lithic procurement and reduction area (Ralph 1996:211). Site 41BX207 was a prehistoric burial in a sinkhole. The sinkhole was discovered in September 1995 by karst survey volunteers, who then excavated the rock and dirt fill by hand in hopes of finding a cave. The human bones included long bone fragments, pelvis fragments, and teeth, all recovered from the uppermost 10 cm of the deposit; three chert flakes were also found (Ralph 1996:212).

In May of 2001 the Center for Archaeological Research (CAR) at the University of Texas at San Antonio conducted an archeological survey of trails and revisited previously recorded archeological sites in the northern and central sections of GCSNA. The trail survey covered a distance of approximately 41.5 km; the total area surveyed equaled approximately 1,599 ac. A total of 86 sites was recorded; 52 sites were previously unrecorded (Greaves et al. 2002). Twenty-four of the 86 sites were recommended for designation as State Antiquities Landmarks (SAL).

Since park opening in 1991, multiple projects have been coordinated through the TPWD Cultural Resources Program to ensure continued protection of the cultural resources at the park. The scope of these projects varied considerably, with many focused on maintenance, alteration, or repair of existing facilities. Utility line installation and upgrades comprise some of the more extensive impacts, while additional sites have been discovered and recorded none of

these later investigations have encountered new cultural deposits or features that are deemed significant.

METHODS

The cultural resources inspection of the proposed project areas occurred in conjunction with park staff and the private contractor selected to complete the work. The park staff had previously selected the areas proposed for repair, and in coordination with the private contractor had prepared a series of maps showing the location of the selected areas and the proposed repairs. The tour group loaded into several vehicles and visited each location in a single day, with on-ground time at each place lasting approximately 15 minutes. At each location the group discussed the proposed repairs and improvements. The author conducted surface inspections along the margins the JJR to search for evidence of prehistoric or historic cultural resources.

RESULTS

A search of the Texas Archeological Sites Atlas and the TPWD Cultural Resources Program records and files for cultural resources occurring near the proposed project areas found that these proposed repairs will partially occur within the boundaries of six known archeological sites – 41BX140, 41BX142, 41BX146-148, and 41BX1496.

Archeological sites 41BX140, 41BX142 and 41BX146-148 were originally recorded in 1972 by Tom Dillehay (1972). These sites were revisited in 2002 by CAR (Greaves et al. 2002) while 41BX1496 was first recorded during the 2002 survey. These six sites were revisited and reassessed in 2011 by SWCA during an intensive archeological survey of 677 ac for a proposed regional stormwater facility (Lawrence et al. 2011).

Site 41BX140 is a prehistoric open campsite comprised of a dense scatter of lithic materials; the site measures approximately 296 m north-south and 186 m east-west. In 2002, a total of nine shovel tests was excavated within the site boundaries, of which six were positive for cultural materials to a depth of approximately 30-40 cm below the surface (cmbs). Artifact density was described as very high with an estimated 5,000 artifacts observed on the surface. Artifacts included debitage, cores, bifaces, and burned rock. In addition, eight projectile points were noted, including Early Archaic Gower points, Late Archaic Shumla, and Ellis points, and a Late Prehistoric Caracara point. The 2002 investigations noted that the major source of disturbance was due to erosion resulting from park visitor pedestrian trail traffic. The 2011 investigations (Lawrence et al. 2011:47) included the excavation of three additional shovel tests, of which one was positive for cultural materials between 0-10 cmbs. Two additional projectile points, one Early Archaic Gower point and one untyped split stem dart point, were recovered. CAR and SWCA both determined that the site merited SAL nomination (Greaves et al. 2002:51; Lawrence et al. 2011:49).

Site 41BX142 is a prehistoric open campsite, with a small concentration of historic artifacts. The site measures approximately 626 m north-south and 148 m east-west. The 2002 CAR survey (Greaves et al. 2002:50) expanded the site boundary to include 41BX143. A total of eight positive shovel tests was excavated and contained materials up to 63 cmbs. An estimated 5,000 artifacts were scattered across the surface, mainly concentrated around three midden features. The midden features are located at the extreme northwest end of the site and range in size from 10-15 m in diameter. Artifacts noted include burned

rock, cores, bifaces (early and late stage), utilized flakes, and three Late Archaic dart points (Ensor, Frio, and Pedernales). Historic artifacts are limited to the northwest end of the site and include mid-twentieth century window glass, zinc sheet metal, and tractor parts. The 2011 investigations (Lawrence et al. 2011:47) included the excavation of 9 additional shovel tests, of which five yielded positive results up to 30 cmbs. A fourth midden was discovered ca. 15 m west of the original cluster and an Early Archaic Nolan dart point was found. CAR and SWCA both recommend additional work for final SAL status determination (Greaves et al. 2002:51; Lawrence et al. 2011:49).

Site 41BX146 is a prehistoric open campsite measuring approximately 237 m northwest-southeast and 213 m east-west. In 2002, seven shovel tests were excavated, of which five were positive to a depth of 50 cmbs. Also, a midden was identified along the east site boundary measuring approximately 2 m in diameter with approximately 20-30 cm of relief. Artifacts observed include early and late stage bifaces, utilized flakes, and an untyped dart point. The 2011 investigations found the site to be in similar condition to what was described in 2002 (Lawrence et al. 2011:52). Five additional shovel tests were excavated beyond the recorded site boundary of which one test yielded a tertiary flake at 15 cmbs. The midden was relocated and found to be larger, more extensive than originally reported, measuring ca. 7-8 m in diameter. Additionally, five smaller burned rock hearth features were noted ca. 15 m west of the midden. The site boundary was extended east and west beyond the 2002 boundary based on the positive shovel test and the burned rock features. CAR and SWCA both recommend additional work for final SAL status determination (Greaves et al. 2002:51; Lawrence et al. 2011:49).

Site 41BX147 is a small prehistoric lithic scatter measuring approximately 151 m north-south and 70 m east-west. CAR excavated three shovel tests, of which two were positive at approximately 20-30 cmbs. Approximately 100-500 artifacts were observed on the surface and included debitage, bifaces, and cores. It was also noted that the site is mostly contained within the existing Joe Johnston Trail/Road and has been heavily impacted by pedestrian and vehicular traffic and erosion. The 2011 SWCA investigations (Lawrence et al. 2011:52) found the site to be in similar condition. No additional shovel tests were excavated due to the lack of sediments. The 2011 pedestrian survey did not observe the hundreds of artifacts observed by the CAR in 2002. Instead the SWCA survey identified a very sparse (n=10-20) scatter of debitage with no obvious artifact concentrations, features, or diagnostics. CAR and SWCA both recommend that the site does not merit designation as an SAL and no additional work is recommended (Greaves et al. 2002:40; Lawrence et al. 2011:52).

Site 41BX148 is a prehistoric lithic scatter that measures 619 m north-south and 44 m east-west. The site is situated on an alluvial terrace immediately adjacent to Government Canyon Creek (Dillehay 1972:18; Greaves et al. 2002b:30). Dillehay (1972:18) reported a light scatter of cores, bifaces, flake tools and flakes. Greaves et al. (2002b:30) observed fewer than 50 flakes on the site surface. Artifacts observed were limited to debitage, while no tools, cores, bifaces, or surface artifact concentrations were noted. Eleven shovel tests were excavated in the site and none suggested the presence of intact, buried archeological remains. The site's geomorphic position relative to the current channel of Government Canyon Creek along with sandy matrix and gravel lenses strongly suggest that many of the recovered artifacts

are from point bar secondary contexts. CAR and SWCA both recommended that the site does not merit designation as a SAL and no additional work was recommended (Greaves et al. 2002:30; Lawrence et al. 2011:53).

Site 41BX1496 is a prehistoric open campsite and historic ranching facility that measures approximately 193 m north-south and 143 m east-west. The site is situated on two terraces with the majority of the prehistoric occupation located on the lower terrace and the historic facility on the upper. The 2002 CAR investigations included the excavation of four shovel tests, of which all were positive to a depth of 50 cmbs. A moderately dense scatter of prehistoric artifacts was observed on the surface and included debitage, bifaces, cores, and burned rock. Two Paleoindian dart point fragments, a Golondrina proximal and a nearly complete Orchard (i.e., Angostura-like) dart point, were collected from the surface. Also, an Early Archaic Uvalde dart point and a Middle Archaic Wells dart point were collected from the surface. Three clusters of fractured rock were observed in a road bed but were not definitively identified as thermal features. The historic features include a corrugated tin metal barn, a windmill, a possible cistern, stock tanks, and several foundations and associated building debris. The 2011 SWCA investigations included the excavation of an additional five shovel tests, with one positive test to 25 cmbs. CAR and SWCA both recommended that the site warrants official designation as a SAL and additional work was recommended with a focus on the possible thermal features (Greaves et al. 2002:40; Lawrence et al. 2011:52).

Ground surface impacts beyond the existing trail/road footprint are proposed for non-SAL recommended sites 41BX147 and 41BX148 (Table 2), while no ground disturbing impacts beyond the existing trail/

Table 2. Drainage feature details located in sites 41BX147 and 41BX148.

Feature ID	Daylight Y/N	Length (m)	Width (m)	Depth (cm)	Notes	Trinomial
A	Y	2.4	1.2	30	Takes advantage of natural drainage	41BX147
B	N	10	1.2	45		41BX148
C	Y	6.7	1.2	45	Add fill down slope	
D	Y	3.4	1.2	15	Add fill down slope	
E	N	4.3	1.2	60		
F	N	4.3	1.2	90		
G	N	3.4	1.2	75	Add fill down slope	
H	Y	2.4	1.2	30	Add fill down slope	
I	Y	2.4	6	30	Atypical wide drain in this location	

road footprint will be permitted within the remainder of the sites (41BX140, 41BX142, 41BX146, and 41BX1496) due to SAL recommendation and resource sensitivity (Table 2). Surface impacts proposed for 41BX147 will include the installation of one drainage feature that will extend beyond the existing trail/road footprint. The drain will measure approximately 2.4 m long, 1.2 m wide, and 30.4 cm deep; the proposed drain will utilize an existing natural drainage (Figure 6). Surface impacts proposed for 41BX148 will include the installation of four drainage features that will extend beyond the existing trail/road footprint (Figure 7). These drainage features will measure in length from a maximum of 10 m down to 2.4 m. All but one of the features will measure 1.2 m wide; the atypical drain will measure 6 m wide. Depth of the drain features will vary between a maximum of 76.2 cm down to 15.2 cm deep. Cultural resources monitoring will be conducted in any areas where subsurface excavation is required near or within known archeological sites.

CONCLUSION

The proposed repairs and drainage feature installations will partially occur within the

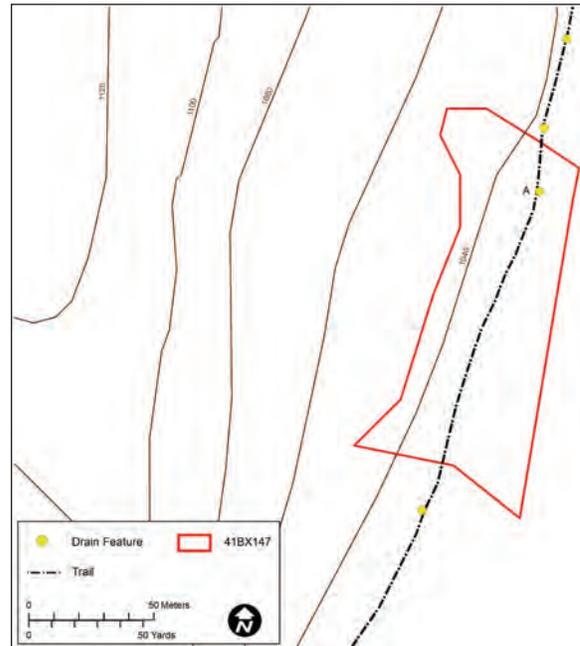


Figure 6. Site 41BX147 details.

boundaries of six known archeological sites: 41BX140, 41BX142, 41BX146-148, and 41BX1496. Ground surface impacts beyond the existing trail/road footprint are proposed for non-SAL eligible sites 41BX147 and 41BX148 while no ground disturbing impacts beyond the existing trail/road footprint will

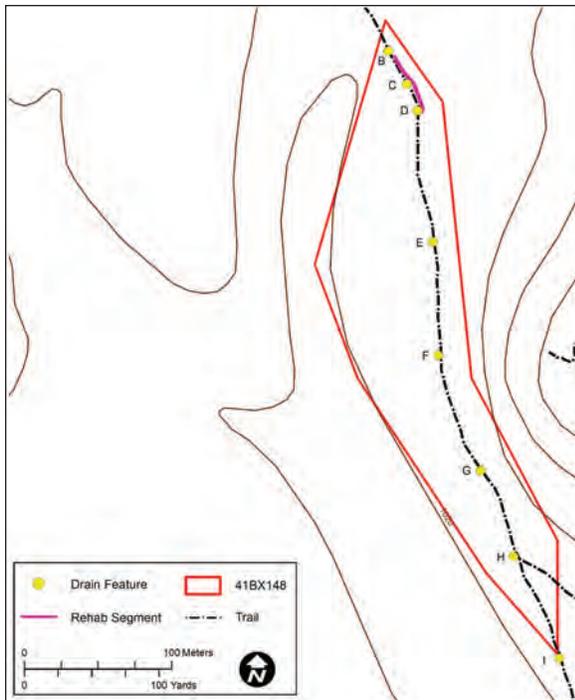


Figure 7. Site 41BX148 details.

be permitted within the remainder of the sites (41BX140, 41BX142, 41BX146, and 41BX1496) due to SAL recommendation and resource sensitivity. Cultural resources monitoring will be conducted in any areas where subsurface excavation is required near or within known archeological sites. Therefore, TPWD recommended the project proceed as planned. Texas Historical Commission concurrence for this project was received in February 2018.

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ARCHEOLOGICAL SURVEY OF NEW TRAILS AND FACILITIES AT GUADALUPE RIVER STATE PARK-BAUER 3 UNIT, COMAL AND KENDALL COUNTIES

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ABSTRACT

Texas Parks and Wildlife Department plans to install approximately 4.5 km of new trails, a restroom facility, and a storage shed at Guadalupe River State Park – Bauer Unit in Kendall and Comal Counties. The trail corridors and facility locations were subject to pedestrian survey augmented with shovel tests. One previously unrecorded archeological site was recorded during the survey, and no known archeological sites, features, or cultural deposits will be impacted by the proposed project. The project is recommended to proceed without additional cultural resource investigations.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) proposes to install approximately 4.5 km of new trails at Guadalupe River State Park – Bauer Unit in Comal and Kendall Counties (Figure 1). The project will also include the installation of a trailside composting restroom and a storage unit located at the park entrance parking lot (Figure 2). The improvements shall occur on lands owned and managed by TPWD. The project shall be funded, at least in part, by a National Recreational Trails Fund Grant, which is administered by TPWD under the authority of the Federal Highway Administration (FHWA) via the Texas Department of Transportation (TxDOT). Due to the federal funding component, the project was reviewed by TxDOT for compliance with Section 106 of the National Historic Preservation Act in accordance with their Memorandum of Understanding with the Texas Historical Commission (THC).

The purpose of this project is to create a more extensive, connective, and sustainable trail network on the Bauer Unit of Guadalupe River State Park; TPWD proposes to construct four new trail segments totaling approximately 4.5 km of new trail (see Figure 2). A 2.4-m wide corridor will be cleared of vegetation to accommodate a 1-m wide trail tread, while the maximum depth of disturbance required for trail construction will equal approximately 50 cm. The installation of the proposed trailside restroom will be compliant with the Americans with Disabilities Act due to the nature of the funding. The facility footprint will measure approximately 3-m wide and 6-m long and will require a maximum depth of disturbance totaling approximately 1.2 m. The proposed storage unit (i.e., shipping container) will measure approximately 2.4-m wide and 6-m long and will not require ground disturbance for installation (see Figure 2).

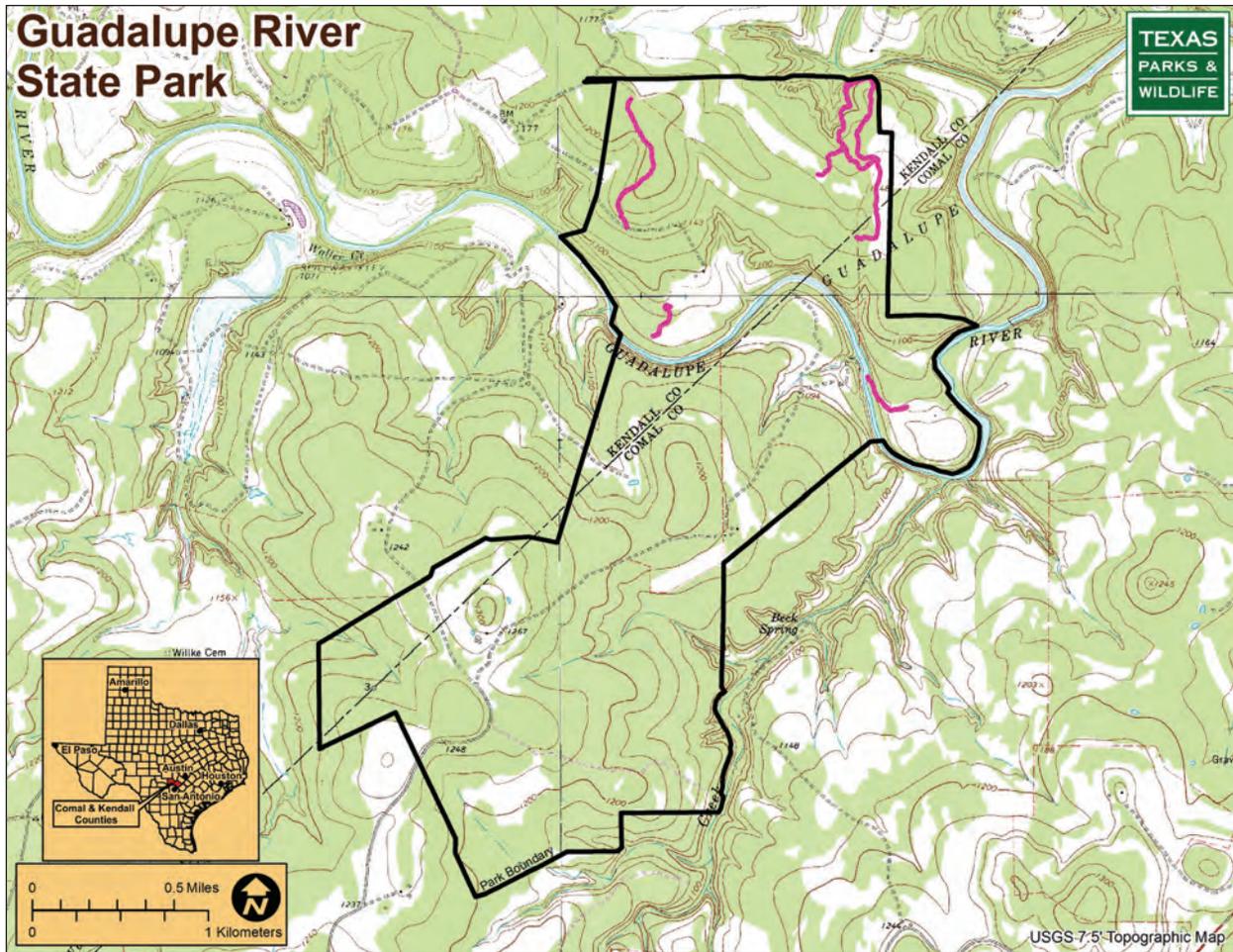


Figure 1. Section of USGS 7.5' topographic quadrangle depicting location of project area.

ENVIRONMENTAL BACKGROUND

The park is located near the east edge of the Edwards Plateau, a vast, dissected limestone plain on the south edge of the Great Plains physiographic province (Fenneman 1931:10, 50-54). Terrain within the state park ranges from nearly level in parts of the uplands to steep areas along the Guadalupe River and its deeply incised tributaries.

The park is underlain by sedimentary formations deposited during the Cretaceous period (Barnes 1983). The uplands are supported by the Glen Rose, a Lower Cretaceous formation that is exposed in

a wide band across the Edwards Plateau, abutted by the Balcones fault zone on the southeast and adjoining the Edwards Formation on the northwest. At lower elevations along the valley walls of the Guadalupe River, the Cow Creek and Hensell Formations are exposed (Barnes 1983).

Much of the park is covered by the shallow loamy and clayey soils that are common across the Edwards Plateau. The thin soils on upland slopes are not suitable for cultivation, but the deeper sediments that have accumulated on terraces and around shallowly incised drainage heads can be farmed (Freeman 1997:10). Five

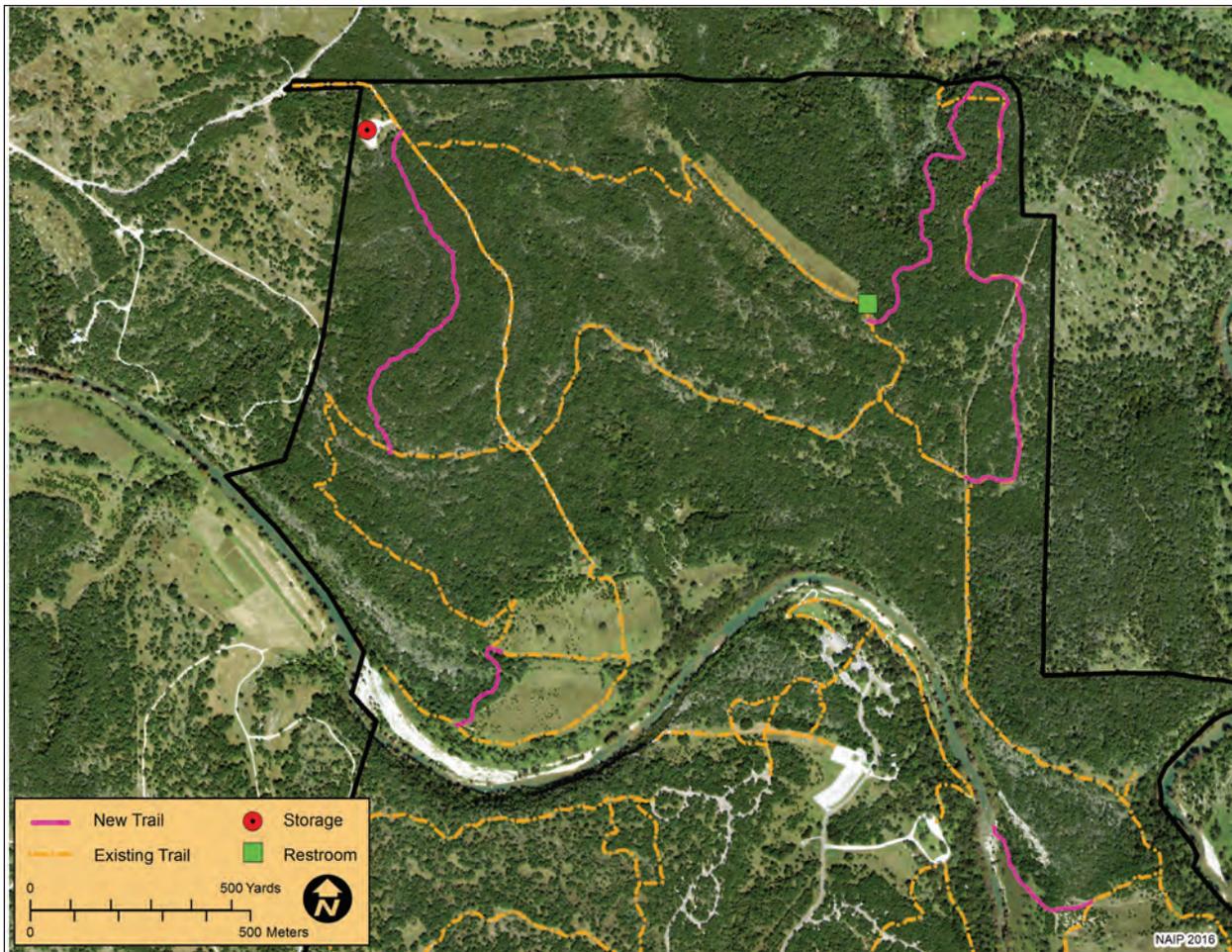


Figure 2. Locations of proposed trails and facilities on Guadalupe River State Park - Bauer Unit.

soil associations have been mapped in the project area: Boerne, Brackett, Denton, Doss, and Eckrant (Batte 1984: Sheets 57, 65, 66).

CULTURAL BACKGROUND

The park is located near the southeast edge of the Edwards Plateau, in the south part of the Central Texas archeological region as defined by Prewitt (1981:71-72) and within the Western Balcones Canyonlands as defined by Decker et al. (2000). Comal and Kendall Counties have a rich archeological heritage as part of these archeological regions. The regions are noted for burned

rock midden features and high quality chert lithic resources. The karst geology of the Edwards Plateau also produces features such as sinkholes (occasionally used for burials) and rockshelters. However, rockshelter sites are unlikely at the park, as the dominant Glen Rose Formation limestone generally erodes in a stair-step topography.

Prehistoric people were drawn to the Edwards Plateau for several reasons. One is that the area has a number of reliable sources of water, including creeks and tributaries, springs, and seeps. These water sources are valuable not only for drinking water but as places that attract game. On the park, the

Guadalupe River and Curry Creek are spring-fed and are typically perennial water sources. Most other water sources across the park are restricted to short-term, seasonal drainages.

Another attractive feature is the high quality chert outcrops found across the Edwards Plateau. While the park rests on the Glen Rose, Cow Creek, and Hensell Formations, secondary chert resources can be found in the Guadalupe River and its terraces (Banks 1990:60; Barnes 1983).

Previous archeological investigations in the main part of Guadalupe River State Park, Honey Creek State Natural Area (SNA), and in Comal and Kendall Counties, provide information on the types, locations, and integrity of sites that may be present in the project area. Previously recorded prehistoric sites in the area generally are located in two topographic settings: (1) on alluvial and Pleistocene terraces and colluvial benches adjacent to permanent streams, seasonal water sources such as springs, and/or ephemeral/intermittent drainages; and (2) on gentle slopes and hilltops.

The most common type of site in this area is the chipped stone tool and debitage scatter, which represents tool-making activities and/or chert procurement areas. Burned rock scatters and burned rock middens are sometimes associated with such lithic scatters, indicating seasonal or short-term campsites where a range of subsistence activities took place, including tool manufacturing, hunting, gathering, and food processing. Some of these campsites were favored areas where repeated occupations occurred over thousands of years, probably because the camps were located near previously constructed earth ovens and close to reliable resources such as permanent water, chert outcrops, and/or abundant wildlife and plants. Repeated

usage and maintenance of earth ovens result in the burned rock midden, which is a pile or layer of fire-cracked rocks, charcoal-stained sediments, ash, and artifacts built up around multiple pit ovens where sotol, agave, and other plant foods were baked. Isolated and multiple burials are rare but have been found in a variety of sites and contexts, including sinkholes, terraces, and burned rock middens (Hines 1993:16).

The 12,000-year history of human occupations on the Edwards Plateau is divided into periods based on major changes in lifestyles. Collins (2004:116-124) proposes a cultural chronology for Central Texas that begins with the Paleoindian period from 11,200 to 8,800 years ago, the Early Archaic from ca. 8,800 to 6,000 years ago, the Middle Archaic from ca. 6,000 to 4,000 years ago, the Late Archaic from ca. 4,000 to 1,300 years ago, and the Late Prehistoric from ca. 1,300 to 250 years ago.

The term Paleoindian traditionally has been used to describe nomadic cultures adapted to hunting large herd animals, but Paleoindian subsistence also was based on small animals and wild plants (Bousman et al. 2004:75-84; Collins 2004:113). The oldest identified Paleoindian occupations on the Edwards Plateau date to around 11,200 years ago, and the period ended around 8,800 years ago. (Bousman et al. 2004:48; Collins 2004:113).

Lanceolate projectile points are the most common evidence of the first Native Americans in the Central Texas archeological region. The fluted lance points that were used in the early part of the Paleoindian period are typed as Clovis and Folsom. Later in the period lanceolate and stemmed projectile points such as Plainview, Golondrina, Wilson, and others replaced the fluted points in Paleoindian tool assemblages (Bousman et al. 2004; Collins 2004:116-119).

By the end of the Paleoindian period, changes in technology and diet reflect a shift to a broad-based hunting and gathering subsistence orientation, termed Archaic (Willey and Phillips 1958:107). In central Texas, evidence of this shift dates to around 8,800 years ago, and the broad Archaic tradition continues for millennia, ending around 1,300 years ago (Collins 2004:119, 122). The Archaic period in central Texas is divided into Early, Middle and Late periods, each identified by the use of particular types of dart points.

Early Archaic component distributional data reflects concentration of occupations near the eastern and southern margins of the Edwards Plateau, where people were occupying the better-watered areas with more reliable and diverse subsistence bases (Collins 2004:119-120). The construction of rock hearths, earth ovens, and burned rock middens features became commonplace during this period.

During the Middle Archaic period, an increase in population apparently is represented by a proliferation of sites and an increase in site size (Prewitt 1981:73). A greater reliance on plant foods is suggested by the increased presence of burned rock middens toward the end of the Middle Archaic, although evidence suggests a continued reliance on hunting (Prewitt 1985:222-226; Collins 2004:121). Burned rock midden use intensified toward the end of the Middle Archaic period and these features were likely utilized to cook sotol, yucca, wild onion, and similar plants (Johnson and Goode 1994:28).

The increase in population that began in Middle Archaic times reached its peak in the Late Archaic period (Johnson and Goode 1994:36; Prewitt 1985:217-218). A substantial increase in the number of styles of Late Archaic dart points could indicate

the existence of many small bands at this time (Prewitt 1981:74). At the beginning of the Late Archaic, warm and dry climatic conditions apparently prevailed (Johnson 1995:90-94). Plants that thrive under dry conditions probably expanded in range and increased in density across the Edwards Plateau, and the burned rock middens in which such plants were cooked were in common use (Collins 2004:121; Johnson 1995:94). Towards the later part of the Late Archaic, the climate generally became less dry (Collins 2004:121). The utilization of drought-tolerant plants may have declined along the eastern Edwards Plateau during this time but continued along its southern and western margins (Collins 2004:122; Decker et al. 2000; Johnson 1995:95; Johnson and Goode 1994:34-35).

The beginning of the Late Prehistoric period around 1,300 years ago is marked by the introduction of bow and arrow technology, possibly from the north (Prewitt 1985:228). The earliest Late Prehistoric arrow points are Edwards and Sabinal, followed by Scallorn and then Perdiz arrow points (Henderson 2001:276-283). The latter point types are the respective horizon markers for the Austin and Toyah phases, which have been defined within the Late Prehistoric period in Central Texas (Jelks 1962). Ceramics, both locally produced and from northeast Texas, appear late in the Central Texas prehistoric sequence and are not abundant. Locally produced bone-tempered ceramics, often typed as Leon Plain, appeared around 950 years ago (Black 1986:339-341, 390; Johnson 1994:269-277,187).

Late Prehistoric subsistence initially did not differ from the preceding Archaic period, but bison became a substantial part of the diet later in the period (Prewitt 1981:74). A drought that affected parts of the Edwards Plateau around 750 years ago occurred just

before the return of bison to the plateau, resulting in an increase in bison hunting (Johnson 1995:99). Plant processing in burned rock middens continued in western central Texas and at a lower level of intensity on the eastern Edwards Plateau (Black and Creel 1997:275, 280-281, 304; Collins 2004:123).

Historic documents indicate that the area of the park was settled in the 1850s when Anglo Americans and German immigrants settled in the area near Curry Creek (Freeman 1997:53). The earliest settlement in the park occurred in the mid-1850s when Philipp Bauer constructed improvements in the vicinity of 41KE74 in what is now known as the Guadalupe River State Park-Bauer Unit. The Bauer family maintained ownership of the property until the early 1930s when the family holdings were sold to J. P. Fuesler (an affluent East Texas industrialist) who eventually sold to a relative of the Richter family, a local ranching family that owned land south of the Guadalupe River. The Richter family sold their holding in the early 1970s and their sale was followed by rapid turnover of the properties in the 1970s until their purchase by TPWD in 1975 (Freeman 1997:38).

Previous Investigations

Ten archeological investigations have been conducted in the park, and all of these investigations were conducted by TPWD personnel. Ron W. Ralph initiated the archeological study of the park in 1975 when he recorded three historic house complexes and their associated archeological deposits. The Richter house (41CM91) had been constructed by German immigrants by 1883; the Rust house (41CM92) was built in 1917, and the Bauer house (41KE74) was built by German immigrants around 1878. The three

archeological sites were officially designated as State Antiquities Landmarks (SAL) on June 28, 1983.

In March 1981, Ralph recorded site 41CM51, a scatter of debitage, burned rocks, and a Pedernales dart point in a road at the base of a ridge overlooking the Guadalupe River (Ralph 1996:156-158). Ralph did not test the site but estimated that its cultural deposits were 15 cm thick. The presence of the Pedernales point dated the site to the Late Archaic period, at least in part (Collins 1995:384; Johnson 1995:73; Johnson and Goode 1994:5). Site 41CM51 was officially designated as a SAL on June 28, 1983.

In April 1989, David Hafernik surveyed a 32 ac tract in the southeast corner of the park that was proposed for juniper clearing and burning (Hafernik 1989). Two prehistoric lithic scatters were recorded on the tract. Site 41CM185 is a small scatter of debitage on a hilltop, and site 41CM186 is a scatter of debitage and tool fragments at the base of a hill. No time-diagnostic artifacts were observed on the sites, which appeared to be surficial but were not tested. Hafernik recommended that both sites be avoided during clearing and brush burning activities (Hafernik 1989).

In November 1989, Andy Cloud surveyed a 121 ac tract adjoining the Guadalupe River where a juniper clearing project was planned (Cloud 1990). He revisited site 41CM51 and updated the information on it, finding no artifacts in two shovel tests he excavated to bedrock at a depth of 10 cm. Cloud collected a Travis dart point fragment and observed cores, debitage, and burned rocks on the surface of the site. The dart points noted by Cloud and by Ralph (1996:156) at site 41CM51 indicate Middle and Late Archaic components (Collins 1995:384; Johnson 1995:73; Johnson and Goode 1994:5). Cloud

also located a historic refuse pile near the Richter site (41CM91). Site 41CM51 and the refuse pile were flagged for avoidance during brush clearing and burning activities (Cloud 1990).

In December 1991, Monty Newton, Bon Davis, Ed Baker, and Mike Miller surveyed two tracts that were proposed for juniper clearing (Newton 1992a, b). During the three-day survey of a 142 ac tract in the south part of the park, Newton recorded a lithic scatter (41CM203) on a level upland surface west of Honey Creek (Newton 1992a). The crew collected three Pedernales dart points, a Marshall dart point, a Williams dart point, a biface, and debitage; the dart points indicate a Late Archaic subperiod I component (Collins 1995:376, 384; Johnson 1995:73; Johnson and Goode 1994:5). Numerous bedrock outcrops indicated that the site was severely eroded, but no shovel tests were dug. Newton recommended that the site be avoided during clearing and brush burning activities (Newton 1992a).

Newton and crew made a two-day survey of another tract to be impacted by juniper clearing, covering 120 ac adjoining the Guadalupe River (Newton 1992b). They recorded site 41KE130, a prehistoric lithic scatter on a bluff overlooking the river. Biface fragments and debitage were collected from the surface, but no time-diagnostic artifacts were noted. Bedrock was exposed across the site and the cultural deposits appeared to be thin, but the site was not tested. Newton recommended that the site be avoided during clearing and brush burning activities (Newton 1992b).

METHODS

TPWD Cultural Resources Program staff conducted an intensive pedestrian survey of the 4.5 km of proposed trail and the

proposed restroom location. Although the anticipated extent of disturbance was 2.4-m wide, a 4-m wide corridor was surveyed to accommodate potential minor changes in the routes. A total of 4.4 ac was surveyed for the proposed project and augmented with shovel tests.

Field methods followed the THCArcheological Survey Standards for Texas which require pedestrian surveys to cover 100% of the area of potential effect (APE) with shovel tests placed at a rate of one per every two acres for parcels measuring between 11 and 100 ac in size. Given that in most places the ground surface visibility is greater than 30%, shovel testing was limited in scope. The survey was performed in 15 m transects and covered the entire areas proposed for construction. The flagged centerline of each new trail was surveyed separately.

The archeological site definition employed during the survey is based on the standard that areas meeting the threshold for site recording have artifact densities exceeding one artifact per square meter. Areas were defined as sites when they contained cultural features, or more than five artifacts within a 5-m ϕ area.

Site boundaries were based on the extent of surficial artifacts and features, as well as landforms where relevant. Site boundaries were recorded via GPS in the field. Within sites, two-digit sub-location numbers were assigned sequentially to features and collected artifacts. Characterizations of cultural materials on sites included a list of the types of artifacts present rather than precise counts or estimates. Artifacts were collected from the surface of sites when they had the potential to yield important information on age or cultural affiliation. Rare artifacts that might be at risk of loss when the facilities are opened to the public

were also collected. GPS readings were taken on all artifacts collected.

Shovel tests were excavated within sites to ascertain whether subsurface cultural deposits were present. Shovel tests were approximately 30-cm ϕ , excavated in 20 cm levels and screened through $\frac{1}{4}$ " mesh hardware cloth. Tests were numbered sequentially and their locations were recorded via GPS. For each stratigraphic zone identified in shovel test profiles, Munsell colors, sediment textures, and inclusions were described. Shovel tests were terminated when they encountered bedrock or its equivalent. All cultural materials, except fire-cracked rock, were collected from the shovel tests. All artifacts recovered during shovel testing were collected and curated at the TPWD Archeology Laboratory in Austin, Texas.

RESULTS

One new archeological site was discovered during the survey: 41KE284 (Figure 3).

41KE284

The site is an open campsite that dates to the Middle and Late Archaic periods and is located on a bluff overlooking a drainage. Vegetation on the site is moderately dense and consists of short and long stem grasses, forbs, cactus, scattered live-oaks, Ashe juniper, persimmon, and white brush; ground surface visibility is at approximately 40%. Site 41KE284 measures 125 m northeast to southwest, 30 m east to west, and covers approximately 0.6 ac. It is defined by the bluff on the north and west sites and by a hill on the east side while the extent of surface artifacts define the south boundary. Artifacts observed include scattered burned rock, lithic debitage, cores, modified flakes, and bifaces. Late Archaic Marshall (n=1) and Fairland (n=2) dart points were collected from the surface (Figure 4). Four shovel

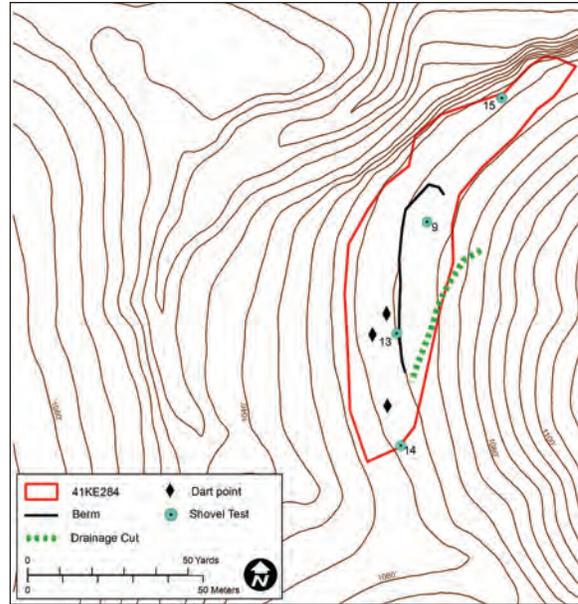


Figure 3. Site 41KE284 details.

tests were excavated across the site; Shovel Tests 9 and 13 yielded cultural materials (see Figure 3).

The site appears to have been heavily impacted by bulldozing and road construction activities prior to acquisition by TPWD. An abandoned two-track road bisects the site and a drainage ditch was also cut along the east site boundary. Additionally, an



Figure 4. Time diagnostic artifacts collected from 41KE284.

earth mound/berm with approximately one meter of relief, was constructed to apparently function as a diversion to funnel water into the drainage ditch (see Figure 3). Site 41KE284 is deemed to have cultural deposits that are less than 30% intact having been severely impacted by bulldozing and construction prior to acquisition by TPWD. The site is not recommended for designation as a SAL because it does not meet SAL Criteria 1 through 4, and it does not merit designation under Criterion 5 at this time because of its low artifact density and lack of features and intact deposits. Site 41KE284 does not appear to merit inclusion on the National Register of Historic Places (NRHP) under Criterion D. The proposed trail segment was rerouted to avoid further impacts to the site.

CONCLUSION

In total, the survey covered approximately 4.5 km of trail, with an area of 4.4 ac. One new archeological site, 41KE284, was discovered during the survey. Although the site is not recommended for official designation as a SAL and it does not appear to merit inclusion in the NRHP, a proposed trail segment was rerouted to avoid further impacts to the site. Therefore, no known historic resources will be impacted by the proposed project. The TPWD Cultural Resources Program recommended that the proposed project be allowed to proceed without further cultural resources investigations. TXDOT/FHWA concurrence for this project was received in May 2018.

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NEW ARCHEOLOGICAL SURVEYS AND MONITORING AT HUECO TANKS STATE PARK AND HISTORIC SITE, EL PASO COUNTY

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ABSTRACT

The entire 860 ac of Hueco Tanks State Park and Historic Site is considered one archeological site and is designated 41EP2. However, the two archeological surveys conducted in 2018 focused on particular areas of the property. The first of these examined 34 locations within the approximately 160 ac of igneous outcrops at Hueco Tanks, where previously unknown rock imagery was documented in 2017, for the presence of archeological deposits; no deposits were found in any of the 34 locations. The second survey focused on the relocation of known hearth features in archeological locales NW1, WS2, and WS3, mapping them with GPS, re-photographing the features, and assessing their current condition. A total of 79 previously known hearth features was examined, as well as 44 newly discovered hearths. A total of 41.6 ac was surveyed during this investigation. In the process of examining these features, it was found that erosional forces (i.e., deflation) are having an ongoing detrimental impact on these features. Texas Parks and Wildlife Department will develop a mitigation strategy that will include attempted reestablishment of native grasses in some areas, and the likely excavation of some of the more intact hearth features to recover data before being entirely lost to erosion.

INTRODUCTION

Archeological Survey of Recently Discovered Pictograph Locations

Multiple cultural resource investigations were conducted at Hueco Tanks State Park and Historic Site in 2018 (Figure 1). In May, Texas Parks and Wildlife Department (TPWD) conducted an archeological survey of 34 locations on rock outcrops where the use of DStretch, a digital image enhancement computer program, in 2017 revealed previously unknown remnant pictographs (Goodmaster et al. 2017). Nineteen of these locations are on North Mountain, three on West Mountain, eight on East Mountain, and four on East Spur. The 2018 archeological survey of these locations was conducted to determine whether archeological deposits are also present at these locations.

Monitoring of Select Burned Rock Features

In October 2018, TPWD monitored the condition of previously recorded burned rock features on the west side of West Mountain and North Mountain, within what are known as archeological locales NW1, WS2, and WS3. These features were originally identified during archeological surveys conducted by the TPWD Archeology Survey Team in 1999 and 2001 (Howard et al. 2010). During the 1999 and 2001 surveys, 125 burned rock features were documented on 11 of the 29 archeological locales, which have been defined within 41EP2. The 2018 investigation included the attempted relocation, mapping, and current condition assessment of the total of 79 previously identified burned rock features in archeological locales NW1 (n=2), WS2 (n=1), and WS3 (n=76). In addition, 44

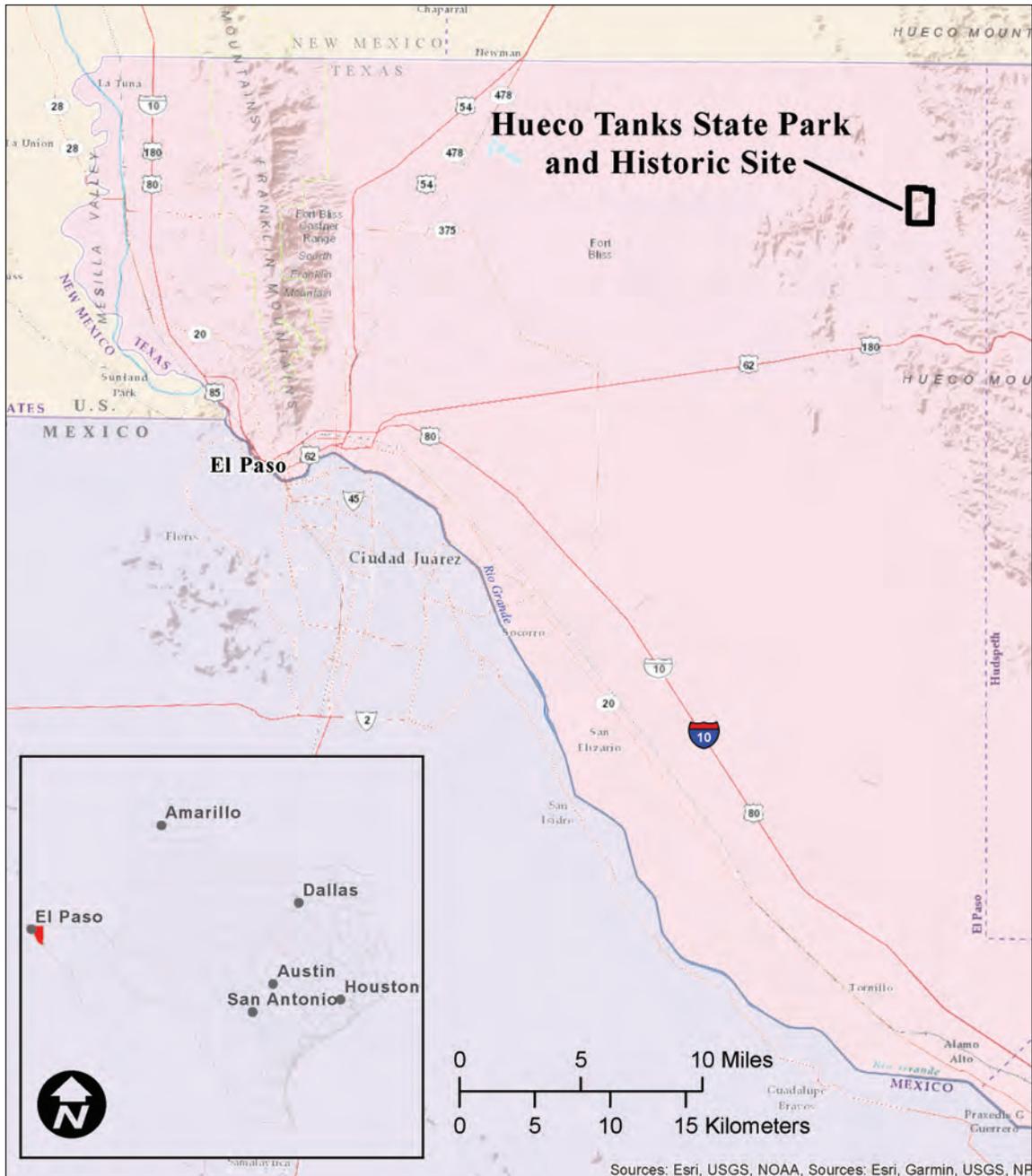


Figure 1. Location of Hueco Tanks State Park and Historic Site, El Paso County.

previously unknown burned rock features, exposed as a result of ongoing erosional processes, were also documented.

ENVIRONMENTAL BACKGROUND

Hueco Tanks is located in the southeast part of the Basin and Range physiographic

province, in the Mexican Highland subdivision (Fenneman 1931:326-438). The province is characterized by isolated, nearly parallel mountain ranges separated by broad flat basins (Church et al. 1996:3). The state property is located near the McGregor sub-basin at the northeast end of the Hueco

Bolson, a broad basin that extends along the Rio Grande for about 210 km (Fenneman 1931:387-388; Gustavson 1991:3; Knowles 2008:2).

Hueco Tanks is situated on the sloping surface of accumulated sediments that have eroded from the west flank of the Hueco Mountains, located about 1.6 km east. Four large igneous outcrops in the center of the state property are the dominant topographic features on the site. West Mountain is the tallest of the outcrops, rising up to 143 m above the surrounding desert terrain. The eastern slopes of these outcrops are relatively gentle, compared to steeper slopes or bluffs on their west faces (Kirkland and Kirkland 1939:Plate 114).

Sheltered between the cluster of outcrops or hills are broad basins on the south and west. Deep canyons cut into the northwest side of East Mountain and the west side of North Mountain. The fractured rock hills also contain many cracks and overhangs, which offer protection from the elements.

Surface water in the Hueco Bolson is extremely scarce (Anschuetz et al. 1990:9). Following storms, rainfall and runoff from the adjacent mountain ranges flow toward the center of the basin and pond in playas, or shallow depressions, at the base of alluvial fans (Blair et al. 1990:201-203). These ephemeral lakes are filled during the late summer and early fall and retain water for a few days to several months before losing it to evaporation (Carmichael 1986:36; Seaman and Mills 1988:21). Several substantial playas are located near Hueco Tanks or are believed to have existed in prehistoric times.

Within Hueco Tanks, runoff from the west flank of the Hueco Mountains is delivered to the area by a network of channels, including large arroyos to the north and south. These channels can carry runoff for

some time after rains. Moisture is retained in soils near the channels and in areas where the water ponds (Mauldin 1995:173-174). Marshy areas or cienegas were once present at Hueco Tanks, based on plant and mollusk remains found in those areas (Bryan et al. 1999:16). A seasonally wet pond was once located between North and East Mountains, as indicated by freshwater snail shells recovered at depth in the area (Freehling and Weise 1976:23; Worthington 1996:60-61). Smaller seasonal wetlands are scattered through the rock hills, indicated by patches of plants growing in moist soils. The many huecos on the state property include some that are open to the air, while others are sheltered by rocks. These basins hold water for periods ranging from several days to several months, depending on their size, depth, and exposure to evaporation.

The semiarid climate of the area is characterized by significant seasonal and annual variations in temperature, precipitation, and wind. Summers generally are long and hot, with around 104 days reaching a maximum temperature of 90°F or higher; winters typically are short and cool, with 65 days dropping to a minimum temperature of 32°F or lower on average (Ramos 1999:88). The average length of the frost-free (growing) season is 248 days, typically beginning in early March and ending in mid-November (Jaco 1971:57).

The average annual precipitation for the area is 20 cm, but yearly rainfall is highly variable (Jaco 1971:57). Over 50% of the annual precipitation usually falls during the monsoon season which extends from July through October, when thunderstorms bring heavy rain and occasional flooding (Dering et al. 2001:60-61). Winter rainfall is less abundant but is not as susceptible to loss through evaporation (Kemp 1983:433). Winter/spring rainfall has a critical impact on

the effective length of the growing season, because the soil must be sufficiently hydrated to support plant germination in the spring (Kemp 1983:431; Mauldin 1995:134-136). The low humidity and abundant sunshine of this region result in an evaporation rate that is up to 12 times greater than the annual precipitation (Dering et al. 2001:61).

The paleoclimatic sequence of the Hueco Bolson has been approximated through pack rat midden analyses and other proxy data; since the late Pleistocene, the trend is toward increasing temperatures and decreasing precipitation (Abbott et al. 1996:41-43, 154). Prior to 12,000 years ago temperatures were milder than they are today, with cooler summers, warmer winters, and greater rainfall, most of which fell in the winter (Van Devender 1990:124-125). Around 12,000 years ago, summer temperatures began to rise and a monsoon season started to develop (Van Devender 1990:126). By 9,000 to 8,000 years ago, summer temperatures had increased and precipitation had shifted to a dominant summer monsoonal pattern, while the frequency of severe winter freezes increased (Dick-Peddie et al. 1993:16; Monger 1993:91; Van Devender 1990:126; Van Devender and Riskind 1979:138). A period of aridity occurred between 10,000 and 7,000 years ago, based on the age of a widespread deflation surface that represents a major erosional episode (Monger and Buck 1995:34-36). The modern climatic regime was established by around 4,000 years ago, with fewer winter freezes and adequate summer rainfall, punctuated by more frequent droughts (Van Devender 1990:126). However, small-scale climatic fluctuations have occurred over the past 2,000 years, based on tree ring data from southern New Mexico (Grissino-Mayer et al. 1997; Mauldin 1995).

The vegetation of the Hueco Bolson is classified generally as Chihuahuan desert scrub (Powell 1998:1-3; Van Devender 1990:105). Distribution of modern plant communities in this region is controlled by moisture, temperature, and elevation: desert scrub grows on the basin floor, grasslands on intermediate surfaces, and woodland communities at higher elevations (Dick-Peddie et al. 1993:27). Hueco Tanks is on an intermediate surface that is covered by desert scrub and degraded desert grassland, but because its igneous-derived soils hold water more effectively than soils in the surrounding area, the plant community in Hueco Tanks also includes a number of woody and water-dependent species (Bryan et al. 1999:16; Van Devender and Riskind 1979:138).

Around 30,000 years ago the northern Chihuahuan Desert was covered by pinyon-juniper-oak woodland; disappearance of pinyon between 12,000 and 10,800 years ago marked the beginning of a vegetation shift (Van Devender 1990:117, 121). Grassland communities were established by around 7,500 years ago (Van Devender and Spaulding 1979:707) and had appeared much earlier (Hall and Riskind 2010:727-728). Between 8,300 and 8,100 years ago, there was a shift to desert scrub (Van Devender 1990:117). Ocotillo, lechuguilla, and creosotebush appeared between 4,200 and 3,700 years ago, and the transition to an essentially modern desert scrub community within the northern Chihuahuan Desert was complete by around 3,600 years ago (Van Devender 1990:117, 121-122). Nonetheless, black grama and other grasses continued to cover the floor of the Hueco Bolson into the mid nineteenth century (Gibbens et al. 2005:665). After ranching was introduced to the area around 1885, this marginal desert grassland was destroyed by overgrazing.

The modern vegetation of Hueco Tanks is quite diverse (Worthington 1980, 1996). The community includes species typical of desert, mountain, aquatic, and grassland habitats. A total of 406 vascular plants in 91 families has been documented, along with 32 mosses, 31 lichens, and 2 liverworts (Worthington 1996).

Due to its varied habitats and relatively abundant vegetation and water sources, Hueco Tanks currently supports a diverse animal community including species from desert scrubland, grassland, and mountainous environments. Forty-two mammal species have been documented, either through observation of live specimens or identification within archeological contexts (Davidson 1982; Johnson 2000:15-25; Worthington 1996:86-93). A total of 211 species of birds has been recorded, including several rare birds (Bryan et al. 1999:22; Zimmer 1996). Thirty-four reptile species have been recorded in Hueco Tanks, including 17 lizards, 5 rattlesnakes, 10 non-poisonous snakes, and 2 turtles (Johnson 2000:18-20; Worthington 1996:71-74). Seven amphibian species have also been documented, including the barred tiger salamander, three species of toads, and three species of spadefoot toads (Johnson 2000:17; Worthington 1996:71).

CULTURAL BACKGROUND

The Native American prehistoric archeological record in the Jornada Mogollon area is divided into four major cultural-historical periods: Paleoindian, Archaic, Formative, and Precontact/Protohistoric. These cultural-historical periods are further subdivided into phases, including recent revisions to the phase sequence for the Middle Archaic, Late Archaic, and Formative periods (Miller 2005, 2017; Miller and Kenmotsu 2004).

Paleoindian Tradition

Early Paleoindian Period (12,000 - 10,200 BP): The Early Paleoindian period time span of 12,000 to 10,200 BP is estimated based on the age of Clovis and Folsom projectile points in dated contexts in other areas, as no early Paleoindian components in the vicinity have been firmly dated (Miller 2006:14). Clovis points were manufactured between 12,000 and 11,000 BP (Miller 2006:13), and are rarely found in the region (Bever and Meltzer 2007:73-74). Only one Clovis point has been reported from the Hueco Bolson (Krone 1976). However, the identification of this point is not certain (Carmichael 1986:7). Folsom points were used from ca. 11,000 to 10,200 BP (Haynes et al. 1992:96; Miller 2006:13, 15) and are considerably more common. Most of the Early Paleoindian sites in the Jornada Mogollon area appear to be short-term residential camps, positioned at locations offering an overview of the surrounding area and ready access to water.

Late Paleoindian Period (10,200 - 8,000 BP): A variety of dart point forms were used during the Late Paleoindian period. They bear distinctive parallel flaking and are collectively assigned to the Plano and Cody complexes (Carmichael 1986:8; Miller 2006:16). Sites dating to this period are relatively rare in the Jornada Mogollon area (Miller and Kenmotsu 2004:217). Changes in climate and vegetation during this time apparently precipitated the demise of *Bison antiquus* and other large game animals, necessitating a shift to a broader subsistence base (Miller 2006:16; Van Devender 1977:192). The drying trend also may have caused humans to congregate near playas, streams, and other permanent and ephemeral water sources (Carmichael 1986:8; Miller 2006:16). Late Paleoindian sites have been found in a variety of topographic settings including alluvial fans, but most are near playas, in basins, or

along the Rio Grande valley margin (Miller 2006:16; Miller and Kenmotsu 2004:217).

Archaic Tradition

Early Archaic Period (8,000 - 6,000/5,000 BP): Defined primarily on the basis of dart point styles, the Early Archaic period is not well understood because few firmly dated Early Archaic components have been identified in the region (Miller 2006:17). Early Archaic projectile point technology represents a change from lanceolate Paleoindian forms to strong-stemmed dart point types (Miller and Kenmotsu 2004:221, 232). Use of rock or caliche to retain heat in hearths becomes apparent during the Early Archaic period, and possibly reflects an increased emphasis on plant processing (Miller and Kenmotsu 2004:221). The onset of the Early Archaic period coincides generally with the establishment of grassland communities in the southwestern United States around 7,500 BP (Van Devender and Spaulding 1979:707), although some grass species had appeared much earlier (Hall and Riskind 2010:727-728; Monger and Buck 1995:60). During this time, small bands of people probably employed a seasonally mobile hunting and gathering strategy across an increasingly diverse environmental landscape (Miller and Kenmotsu 2004:222-223).

Middle Archaic Period (6,000 - 3,400 BP): Miller (2017) recently revised the phase sequence for the Middle Archaic period to include a Tularosa phase (6,000-4,500 BP) and a Keystone phase (4,500-3,400 BP), based largely on the appearance of new projectile point styles and feature types. The drying trend that began in the Early Archaic continued through the first half of the Middle Archaic, the Tularosa phase. As the distribution of plants and animals became more restricted and their timing more

variable, a land use pattern may have been adopted that focused on seasonally available food resources. The rock hearths and ground stone tools that date to this period suggest a focus on plant foods in addition to hunting (Miller 2007:3-3). There is some indication that the population was increasing during this time (Miller and Kenmotsu 2004:223), and clusters of features on some sites may indicate the presence of larger social groups (Miller 2006:18; Miller and Kenmotsu 2004:224). The use of obsidian from Chihuahua in the manufacture of some dart points during this period (Miller and Kenmotsu 2004:234; Miller 2006:27) indicates the extent of the territorial range and/or the trade relationships between Middle Archaic populations (Miller 2002, 2006:27). Most known Middle Archaic sites are temporary camps, but evidence of semi-sedentary settlement has also been found in the region (Miller and Kenmotsu 2004:224; O'Laughlin 1980:135-149). The Keystone phase marks the onset of wetter conditions and, with it, evidence of population growth, the first use of maize, and the beginnings of ritual practices (Myles Miller, personal communication December 5, 2017).

Late Archaic Period (3,400 - 1,500 BP): This period in the Jornada region includes the Fresnal (3,400-2,750 BP), Arenal (2,750-2,300 BP), and Hueco phases (2,300-1,500 BP) (Goodmaster et al. 2017:6, 11-13; Miller 2017). During this time, transitions in settlement patterns, subsistence, and technology were initiated, foreshadowing the Formative period (Miller 2007:3-3; Miller and Kenmotsu 2004:225-226). The modern climatic regime had been established by around 4,000 BP, with fewer winter freezes and adequate summer rainfall, punctuated by more frequent droughts (Van Devender 1990:126). An interval between 2,600 BP and 2,300 BP may have been slightly cooler with

higher effective moisture (Mauldin 1995:164-165; cf. Van Devender 1990:117-118). Late Archaic subsistence was centered on hunting and gathering, augmented by early attempts at plant cultivation (Doleman 2005:115-116; Miller 2007:3-3). In the Jornada Mogollon area, cultivated plants appeared around the beginning of the Late Archaic period (Miller and Kenmotsu 2004:226-227; cf. Upham et al. 1987:412).

Although cultivated plants constituted a relatively reliable food source, they comprised a very small part of the diverse Late Archaic diet (Miller and Kenmotsu 2004:227-228). Instead, there is evidence of an increase in bulk processing of leaf succulents like lechuguilla and sotol (Miller 2007:11-59; O'Laughlin 1980:106-107). The meat diet in areas near mountains consisted primarily of large mammals like mule deer (Miller 2007:12-6; Wimberley and Eidenbach 1981:23), but faunal remains from most Late Archaic open-air sites consist primarily of rabbit bones (Miller and Kenmotsu 2004:228). Late Archaic dart points are corner- and side-notched forms with convex or flat bases and became significantly smaller in the latter half of the period, foreshadowing introduction of the bow and arrow (Miller 2007:3-3; Miller and Kenmotsu 2004:226, 229; Roney 1985:22). The use of basin areas reached a peak during this period, although sites were located in all environmental zones (Miller 2007:3-4; Miller and Kenmotsu 2004:230-232). Cultivation of plants on even a minor scale decreased mobility, necessitating occupation of places that offered access to both agriculturally productive land and favored foraging areas (Doleman 2005:118; Mauldin 1995:114). The population density continued to increase during this time (Whalen 1994a:625).

Formative Tradition

Formative Period (1,500 – 1,000 BP): The beginning of the Formative period in the study area is marked by the appearance of El Paso Brownware pottery around 1,500 years ago (Miller 2005:68, 2007:3-1, 2017; Miller and Kenmotsu 2004:258). In the southern Jornada Mogollon area, including Hueco Tanks, the Formative period is divided into the Mesilla phase (1,500-1,000 BP), the Early Doña Ana phase (1,000-850 BP), the Late Doña Ana phase (850-700 BP), and the El Paso phase (700-550 BP), based primarily on differences in pottery styles and architecture (Lehmer 1948:70-89; Sayles 1935:72-79).

The climate at the beginning of the Formative period, during the Mesilla phase, was effectively modern with periods of drought (Grissino-Mayer et al. 1997:52; Mauldin 1995:159-166). Subsistence at the onset of the Mesilla phase was based primarily on wild plant foods, supplemented by small amounts of cultivated plants (Miller and Burt 2007:2-2; Miller and Kenmotsu 2004:237). Broad-scale gathering of an array of wild plants shifted by the end of the phase to intensive procurement and bulk processing of leaf succulents like agave and sotol (Miller 2007:11-40). There was also an increasing use of corn and other cultigens, though an economy including corn as a staple element did not occur until 900 years ago (Hard et al. 1996:298; Miller and Kenmotsu 2004:244). The wild and cultivated plant diet was supplemented by meat from rabbits and other small game, while hunting of deer and other artiodactyls declined (Miller 2007:3-6, 12-7).

At the outset of the Mesilla phase, occupations were widely distributed across the interior of the Hueco Bolson (Carmichael 1986:227-229; Miller and Kenmotsu

2004:244-245; Whalen 1977:140, 1978:33-34). However, by about 1,450 years ago, there was decreased use of the central area of the Bolson, accompanied by intensified land use and a greater degree of residential stability. Shrinking territorial ranges are suggested by a decrease of Chihuahuan obsidian in Mesilla phase chipped stone assemblages (Miller 2002, 2005; Miller and Shackley 1998) and only rare occurrences of nonlocal marine shells, minerals, and turquoise (Miller 2007:4-13 through 4-14; Miller and Burt 2007:9-8). In response to increasing population density, groups began to aggregate into small settlements composed of two to three household clusters (Miller and Burt 2007:9-6). Houses consisted of shallow, circular huts and square to sub-rectangular pithouses or pitrooms (Hard 1983a:42-44; Lehmer 1960:127; Miller 2005:69; Miller and Kenmotsu 2004:241). This period of transition marks the end of the early Mesilla interval and the beginning of the late Mesilla interval (Mauldin 1995:277-278; Mauldin et al. 1998:158; Miller 2005:74; Whalen 1994b:625). Regardless, Hueco Tanks was probably used as a seasonal water source throughout the Mesilla phase (Carmichael 1990:126-127; Hard 1983b; O'Laughlin 1979:5).

Originally defined by Lehmer (1948:78-80, and subsequently refined by Carmichael (1986), the Doña Ana phase was conceived to encompass the transition from pithouse to pueblo occupations (Lehmer 1948:78-80). More recently, the phase was divided into early and late intervals at 850 BP based on differences in settlement pattern, subsistence, technology, and social organization (Miller 2005:73-74). However, two types of structures were occupied throughout the Early and Late Doña Ana phases—sub-rectangular pithouses or pitrooms and one-room adobe structures

(Miller and Kenmotsu 2004:239-241; cf. Lehmer 1948:78-80). Sub-rectangular pithouses or pitrooms probably represent fairly short-term occupations because they required little effort to construct. One-room adobe structures required a greater level of effort to construct and maintain, probably representing longer occupations (Miller 2005:68; Miller and Kenmotsu 2004:239; Scarborough 1989:422). By the onset of the Late Doña Ana phase, the number of freestanding one-room adobe structures in the Jornada Mogollon area had doubled, while construction and use of sub-rectangular pithouses declined and essentially ended by 700 BP (Miller and Kenmotsu 2004:240). Major changes in regional settlement patterns occurred during the Doña Ana phases. Use of the central basin declined markedly (Mauldin 1995:218), while occupation of alluvial fans and runoff zones increased (Miller 2005:69, 2007:3-8). Around 850 years ago, utilization of alluvial fans reached a peak and settlements near playas became common (Miller 2005:69; Miller and Kenmotsu 2004:246). These locations probably were preferred due to the proximity of arable soils and reliable water sources (Beckes et al. 1977:73; Carmichael 1990:129-130; Miller 2007:3-6).

Climatic conditions fluctuated considerably during the Doña Ana phases. On the heels of the warm and dry late Mesilla phase, the climate became relatively cool and moist between about 950 and 800 years ago (Grissino-Mayer et al. 1997:52; Mauldin 1995:159-166). That interval was followed by a period of below-average rainfall, culminating in a severe drought between about 700 and 725 years ago (Grissino-Mayer et al. 1997:49, 52, 60). Changes in subsistence occurred at the beginning of the Early Doña Ana phase, perhaps in response to the period of relatively cool and moist

conditions that characterized the beginning of the phase (Doleman 2005:117; Grissino-Mayer et al. 1997:52; Mauldin 1995:159-166). Agricultural dependence increased (Miller 2005:71; Miller and Kenmotsu 2004:249), and exploitation of succulents and other wild plants intensified (Hard et al. 1996:298; Miller 2005:71; Miller and Kenmotsu 2004:249). Hunting generally decreased in importance during the Doña Ana phase (Miller and Kenmotsu 2004:232), with smaller animals being more commonly found within Doña Ana deposits than larger game (Miller 1989:293-297; Peterson, ed. 2001:243; Shafer et al. 1999:296-297). This corresponds with the fact that projectile points typically comprise a very low percentage of chipped stone assemblages dating to the Doña Ana phase (Miller and Kenmotsu 2004:255).

Ceramic assemblages dating to the Doña Ana phases continued to be dominated by locally made brownware (Hard et al. 1994:278), but the proportion of decorated brownware increased gradually (Miller and Kenmotsu 2004:252; Whalen 1981:220). Nonlocal pottery comprised a small but consistent percentage of Doña Ana assemblages. Vessel forms also evolved; the quantity of neckless jars declined while the proportion of jars with necks and everted rims increased, vessel sizes expanded, and vessel walls became thinner (Miller 1989:186; 2007:3-9; Miller and Kenmotsu 2004:253; Whalen 1981:223-226). This may reflect changes in cooking techniques and/or storage needs during this time.

The El Paso phase represents the peak of Native American cultural development in the Jornada Mogollon area. It saw the highest level of permanent settlement in pueblos, maximum concentration of populations near areas suitable for agriculture, and greatest degree of interregional interaction

and spiritual expression (Lehmer 1948:80-82; Miller and Kenmotsu 2004:238). These developments were facilitated by a period of reduced climatic variability that began about 700 years ago (Grissino-Mayer et al. 1997:54). Precipitation increased considerably and was abundant between about 650 and 600 BP (Grissino-Mayer et al. 1997:62). This period of increased precipitation was followed by multiple short-term droughts (Grissino-Mayer et al. 1997:63) that may have ushered in the end of the intensive El Paso phase lifestyle.

Ceramic assemblages dating to this phase are dominated by El Paso Polychrome. The Classic variant of this type was made between about 750 and 550 years ago (Miller 1995:212-216). Nonlocal pottery is present on El Paso phase sites in minor amounts. Projectile points generally comprised a very small part of El Paso phase chipped stone assemblages, as they had prior to 700 BP (Miller 2007:3-10; Miller and Kenmotsu 2004:255). Ornaments and other non-utilitarian artifacts are relatively abundant on El Paso phase sites, and include shell jewelry, turquoise, other shaped stones, and (rarely) copper bells (Bentley 1993:28; Brook 1976:26-27; Hill 1971:92; Miller and Graves 2009:385-392; Phelps 1967:24-25). Some of these items were imported from outside the Hueco Bolson and others were obtained from local sources; altogether, they may indicate the development of a religious complex (Miller and Kenmotsu 2004:238). The quantity of nonlocal items on El Paso phase sites far exceeds previous phases, representing a high level of participation in a regional exchange network (Hard, Patterson, and Tennis 1996:243-244; Lehmer 1948:80-82).

Agricultural dependence and specialization increased during the El Paso phase, although subsistence was not based entirely on

cultivated plants (Miller and Kenmotsu 2004:251). Wild plant foods made up a smaller portion of the El Paso phase diet (O’Laughlin 2005:221), and hunting continued to provide a minor part of the diet. A growing emphasis on accumulation of food reserves is indicated by increased construction and use of storage and refuse pits after 800 BP (Miller 2005:72).

Structures occupied during the El Paso phase include freestanding one-room structures and pueblo room blocks (Miller 2005:70; Miller and Kenmotsu 2004:240-241, 244), sometimes occurring on the same site. Their construction differed primarily in terms of whether structures had common walls (Miller and Kenmotsu 2004:239). Pueblo room blocks were laid out on two general plans, both resulting from incremental construction: linear tiers, and (rarely) squares facing onto interior plazas (Lehmer 1948:80; Lowry 2005:304; Miller and Kenmotsu 2004:242). Both freestanding and adjoining rooms typically had east/west alignments, with doorways opening to the south (Brook 1979:27; Miller and Kenmotsu 2004:242). Many linear room blocks included single larger rooms that may have had a communal function (Marshall 1973:95).

El Paso phase settlement generally was characterized by an increased number of large and small residential sites, a clustered settlement pattern, and decreased mobility (Miller 2007:3-6, 3-9; Whalen 1978:33-34). Use of the central basin was non-intensive (Mauldin 1994:200-201) and there was a marked decline in occupation of alluvial fans, while occupations in proximity to playas reached a peak (Brook 1971:68; Miller 2005:69, 72; Miller and Kenmotsu 2004:238). The large settlements may not have been occupied year-round (Beckett and Wiseman 1979:399). Residential permanency at

large sites may have been possible during wet years while seasonal movement would have been necessary during droughts (Miller 2007:3-7).

The end of the El Paso phase around 550 BP is marked by the demise of pueblo occupations in the Jornada Mogollon area, coinciding with region-wide depopulation of the southern Southwest by agricultural groups (Miller and Kenmotsu 2004:258). The causes of these dramatic changes have not been determined, but one of the more compelling theories is that climate change brought an end to the overspecialized El Paso phase agricultural economy, causing populations to disperse to more productive areas and/or return to a simpler subsistence based primarily on wild plants and animals (Tainter 1985:146-147; Upham 1984:248-249; Wimberly and Rogers 1977:450-453).

Historic Occupations

Precontact and Protohistoric Periods (550 BP - ~340 BP): The Precontact period in the region began in 1450 and ended when Spanish explorers first encountered native groups at the Paso del Norte in 1581; the Protohistoric period extended from that date until 1659, when a mission was established at the pass and European contacts with native groups became sustained (Miller 2007:3-1; Sale 1997:131-132). Historic accounts indicate that native groups identified as Manso, Suma, and Apache occupied the Hueco Bolson and adjacent areas during the Protohistoric period, and probably earlier. But, only the Apache Indians are reported to have occupied the area around Hueco Tanks when the Spanish arrived. They were known to occupy hilltops with commanding views of surrounding areas (Seymour 2004:158).

Recognition of Precontact/Protohistoric archeological components has been challenging, and there is disagreement

as to what constitutes sufficient proof of them (e.g., Kenmotsu and Miller 2008, Lukowski et al. 2007:57-60; Seymour 2008). The few features of this age (Miller 2001:117-120) typically have been found on multicomponent sites, increasing the difficulty of their identification. Structures described in historic accounts are informal straw, brush, and pole huts that bear a strong resemblance to earlier pithouses, and their archeological signatures might be indistinguishable (Beckett 1985:150; Miller 2001:149). A greater percentage of hearths dated to this period include rocks than in the periods that precede and follow it, but similar rock hearths are also known from the Archaic period (Miller 2001:122-123).

Artifacts indicating the Precontact/Protohistoric periods, including Tabira Black-on-white and late glazeware ceramics, metal and glass arrow points, and glass trade beads, have rarely been found on sites in the Hueco Bolson (Miller 2001:124; Sale 1997:140-141; Seymour 2004:168). Ceramics are rarely mentioned in historic accounts and could have been almost absent (Bandelier 1892:349; Beckett 1985:150). Arrow points might include the Soto type, which resembles Garza arrow points that date between 1450 and 1650 in the Texas Panhandle-Plains, but Soto points are uncommon north of the Rio Grande and are not well dated (Boyd 1997:428-429; Miller 2001:126, 129; Phelps 1987:9, 16, 19). Other arrow points apparently include small triangular side-notched or basally-notched forms similar to those found on El Paso phase sites (Miller 2001:128). To date, radiocarbon assays have provided the only incontrovertible evidence of the Precontact/Protohistoric period in the Hueco Bolson (Miller 2001:115, 122, 124).

Previous Investigations

The earliest published descriptions of the rock art at Hueco Tanks were written in the mid-nineteenth century by persons traveling along the trail that led through the Tanks. The trail/road was known by various names through the years, including the Upper Emigrant Road, Upper El Paso Road, Butterfield Overland Mail Route, and others. The Duval-Harris party stopped there in 1849, and Harris later described the pictographs, including rock imagery site N6E (Dillon, ed. 1960:49-50; Moody 1963:86; Davis and Toness 1974:58). John Russell Bartlett of the International Boundary Commission stopped at the Tanks in March 1851; he camped at the Site and sketched the pictographs he observed at several rock art panels (Bartlett 1854:170-173; Mallery 1893:115-116).

Years later, in 1921 and/or 1927, Frank H. Roberts of the Smithsonian Institution Bureau of Ethnology apparently visited the Tanks during a trip to view Ceremonial Cave and other nearby caves (Creel 1997:76; Roberts 1929:1; El Paso Post, September 15, 1927). After the El Paso Archaeological Society (EPAS) was formed in 1922, members began to record the rock imagery at the site. One of them was professional photographer Otis A. Aultman, who became vice president of the society (Hedrick 1972:52; Walsh 1950:1). EPAS member Colonel M. L. Crimmins published descriptions and sketches of pictographs at the Tanks. He estimated that there were about 2,000 images and recommended that the State of Texas acquire Hueco Tanks in order to protect them (Crimmins 1931:29-30). In 1927 and 1935, A. T. Jackson of the University of Texas at Austin made brief visits to Hueco Tanks and photographed and sketched pictographs at some of the panels that he observed (Jackson 1935, 1938:10-21).

The archeological deposits at Hueco Tanks also received attention. In 1930-1931, archeologist Donald Brand surveyed four sites near El Paso, including Hueco Tanks, for comparison to 400 sites in Chihuahua (Brand 1933:Appendix III:69; Rakita and Raymond 2003:167, 173). Brand collected 38 sherds from the Tanks, which would eventually be classified as El Paso Polychrome, Chupadero Black-on-white, Three Rivers Red-on-terracotta, Little Colorado Black-on-red (St. Johns Polychrome), indented rim redware (Playas Red?), corrugated, and unclassified painted pottery (Brand 1933:Plate 10; Carlson 1970:31; Rakita and Raymond 2003:173). Archeologist E. B. Sayles visited Hueco Tanks in 1932, during which time he collected a number of pottery sherds and a few chipped stone artifacts and photographed some of the rock imagery at the Site (Sayles 1932).

Forrest and Lula Kirkland undertook the first systematic rock imagery recording at Hueco Tanks in July of 1939, on the recommendation of A. T. Jackson (Kirkland and Kirkland 1939). The Kirklands found images in 13 overhanging cliffs, 23 niches and crevices, and 37 of the approximately 60 smoke-stained rockshelters that they examined (Kirkland and Kirkland 1939; Kirkland 1940:9). Shelters near the natural water tanks had the greatest quantity and variety of imagery (Kirkland 1940:9). Forrest devised a designation system for the Hueco Tanks pictographs; he assigned sequential numbers to 27 clusters of rock imagery panels, plotting them on a map where he labeled the rock hills as North, East, and West Mountains. Within each rock imagery site, groups of images were indicated by letter suffixes, beginning at the left end of the site (Kirkland and Kirkland 1939). Over a period of ten days, Forrest Kirkland made precise watercolor copies of hundreds of pictographs. Kirkland's images were

published in 1967 (Kirkland and Newcomb, Jr. 1967:173-203), and his designation system is used to this day.

Inscriptions dating to 1941 near the pictographs at Cave Kiva, also known as panel N30, indicates that those particular pictographs were visited by that time (Toness and Hill 1972:4). A Boy Scout group, led by El Paso Archeological Society (EPAS) member Mack Hill was also known to have visited the location in 1956. However, the panel was not formally reported until 1972 (Toness and Hill 1972:4). Due to the inaccessibility of Cave Kiva, Toness and Hill (1972:13-14) suggested that it may have been used for ceremonial purposes.

After almost three decades of little attention to the archeological deposits at Hueco Tanks, the focus returned to the deposits in 1963, when archeologist John Greer made a brief trip to the Tanks during his west Texas ring midden study (Greer 1968:1; personal communication 2004). Greer gathered some 225 pottery sherds and a few chipped stone artifacts during his visit.

Scholarly interest in the rock imagery of Hueco Tanks continued when the State of Texas acquired the property in 1969. More pictographs were soon discovered, such as those at Cave of the Masks (W29) (Binion 1970:43). In December 1971, John Davis recruited fellow EPAS members and the Anthropology Club of the University of Texas at El Paso to inventory the 1,200 images previously recorded by Kirkland, note any damage, and assess the causes of the damage (Davis and Toness 1974:5). During 23 days between January and October of 1972, Mike Bilbo, John and Marguerite Davis, Tom and Cynthia Martin, Odin and Kay Toness, and members of the Anthropology Club of the University of Texas at El Paso relocated, sketched, and photographed the

pictographs (Bilbo 1972a, 1972b, 1972c; Davis and Tones 1974:2; Tones 1972). They found 300 additional images that had not been noted by Kirkland, recording them as addenda to existing sites and as new sites (Davis and Tones 1974:57). Condition assessments indicated that 25% of the panels recorded by Kirkland had been destroyed; of the 75% remaining, half had suffered some type of damage, mainly from graffiti and picnic fires (Davis and Tones 1974:8). Anthropologist Tones (later Sutherland) became interested in rock imagery and began analyzing and classifying the Hueco Tanks pictographs, which became her lifelong passion (Sutherland 1975, 1991, 1995, 1996; Sutherland and Geise 1992; Sutherland and Parker 1991; Tones 1973, 1974).

In January 1972, a few years after Hueco Tanks became a state park, members of the EPAS and the Anthropology Club of the University of Texas at El Paso inspected areas where new infrastructure was built or was being proposed. Among their discoveries was a large area of midden-stained sediments and numerous artifacts, covering one to two acres, within what is now known as locality NE2. The discovery was brought to the attention of TPWD archeologists, and excavations were subsequently conducted in the area in October and November of 1972 and 1973 (Bilbo 1972a:1-3, 1972c:7; Kegley 1972a:7-8, 1979:19). Excavations began on a small rise where a concentration of artifacts on the surface appeared to indicate the most intact archeological deposits (Kegley 1980a:5). Hand excavations during the 1972 season encompassed 93 square meters, most of which were arrayed in three blocks. In addition, a backhoe trench measuring 31-m long was excavated, along with several shorter trenches (Kegley 1972 field maps; Kegley 1982:4-5). TPWD archeologists recovered evidence of three pithouse or

pitroom structures and four graves dating to the Doña Ana phase (Kegley 1982:21-22). The area was designated as Hueco Tanks Village.

In February 1972, volunteers surveyed an area where backhoe trenches had been dug for water/wastewater lines (Bilbo 1972b:1-2). The team noted some 15 prehistoric hearths, chipped stone debitage, and pottery sherds (Bilbo 1972b:1). West of the hearths was another midden estimated to be 15-m long and at least 1-m thick (Bilbo 1972b:2).

In November of 1972, Kegley conducted test excavations in two areas outside Hueco Tanks Village. In the southwest part of the state property, five test units were dug in an area that Kegley designated as 41EP2B, perhaps to identify what Tones (1974) later suggested was a "possible pueblo site." Midden deposits up to 1-m thick were encountered, but no features were identified that could be interpreted as structures (Kegley 1972b; Ralph 1978). Kegley also tested an area in the Escontrias ranch complex, near the center doorway of the three-room stone ruin. Over 1,700 historic artifacts were recovered.

In October 1972, EPAS members tested cultural deposits in the crevice that contains rock imagery site W36 (Davis 1972:2). Inside the cave at the upper end of the crevice, a reservoir had been created by building a rock dam across a watercourse (Davis 1972:2, 5-6, Figures 5-6; Kegley 1982:39, Appendix VIII). Pottery sherds littered the floor. Two mounds of sediment at the upper end of the cave were tested. A trench into the taller of the two mounds hit water at a depth of 1.04 m, and a trench in the other mound struck water at 46 cm. Davis suspected that the mounds of sediment had been dug up to access a natural bedrock basin (Davis 1972:3-4). The trench excavations yielded El Paso Polychrome and Chupadero Black-on-white

sherds, and a few chipped stone artifacts (Davis 1972:3-5). Further down the crevice, a crawlway of highly polished bedrock led to two deep huecos (Davis 1972:6). After the water was drained from one of them, its fill yielded many El Paso Brown and Chupadero Black-on-white pottery sherds, as well as whole and fragmentary dart points (Davis 1972:5-6).

At the beginning of the 1973 field session at Hueco Tanks Village, a magnetometer survey of the area was also initiated. Five anomalies were found and tested with 1 m x 2 m units, which located three additional pithouses or pitrooms, an artifact concentration, and an iron stake from the 1972 grid (Arnold 1982:46-48). A less precise magnetometer search covering a broader area located six anomalies; three were tested, but no cultural features were found. The 1973 hand excavations, including 11 isolated units to test magnetometer anomalies and other locations between and around the aforementioned residential features, covered 75 square meters. In addition, several small backhoe trenches also were excavated (Kegley 1982:4-5).

In October 1973, a test pit was excavated by EPAS members in the rockshelter containing rock imagery site W37E. Little information is available about this test excavation but slides of the excavation indicate that the unit produced ceramic sherds and bone fragments (Davis 1972).

Professional archeological survey and rock imagery documentation at Hueco Tanks resumed in 1977, when TPWD archeologists examined areas proposed for an overflow picnic area, campground extension, and amphitheater (Ralph 1977; 1996:172-173). With the help of EPAS member Mike Bilbo, midden-stained sediments, rock imagery, packrat middens, water storage features, and

artifacts were mapped on large-scale TPWD topographic maps and aerial photographs (Bilbo 1978; Ralph 1996:173, 176; Sutherland 1978:83). In the course of this work, Bilbo located additional pictograph sites that had not been previously recorded (Bilbo 1978; Ralph 1999; cf. Riskind 1994).

Also, between 1979 and 1991, four human graves were exposed at various locations at Hueco Tanks and were recovered. In August 1979, visitors dug around bones in a rock shelter and then alerted site staff when they appeared to be human; TPWD archeologist George Kegley subsequently excavated the burial (Kegley 1980b). In May 1982, a visitor noted human bones in the wall of an arroyo, and in July of that year, human remains were found in an eroding trail; TPWD archeologist Ron Ralph later excavated those burials (Ralph 1997:105). In November 1991, when a climber found human bones on a sheltered ledge, Ralph and site staff removed them (Ralph 1991).

In September 1985, archeologists surveying the All American Pipeline examined an existing 30-m wide pipeline corridor that crosses the southwest corner of the state property. Cultural material identified within the corridor was limited to a chert core and a ceramic sherd with black and red paint (Plog et al. 1989:26).

As a result of extensive vandalism that was occurring to rock imagery at Hueco Tanks, Ralph spearheaded an effort in 1991 and 1992 to make detailed records of rock imagery threatened by vandalism. He led a group of TPWD staff and volunteers who compiled measured sketches, photographs, and watercolor paintings of rock imagery panels (Montgomery 1994). But, concerned with the slow pace of documentation, Ralph (1993) recommended that TPWD contract for a property-wide rock imagery survey.

Beginning in the mid-1990s, attempts were made to directly date Hueco Tanks pictographs via radiocarbon assay (Hyman et al. 1999; Rowe 1996, 2005). Charcoal and/or organic binder was extracted from pigment samples by means of low-temperature, low-pressure oxygen and argon plasmas, and dated via accelerator mass spectrometry. Eight of the seventeen samples were red, white, or black inorganic pigments that did not yield sufficient carbon to be dated (Hyman and Rowe 1999:68). Nine black organic pigment (charcoal?) samples produced dates spanning the Mesilla, Doña Ana, and El Paso phases of the Formative period. These dates ranged from approximately 1,590-980 BP to 980-610 BP (Hyman et al. 1999:76; Rowe 2005:91).

In 1995, a proposed parking area was surveyed (Ing 1996), as was a 30-m wide existing pipeline corridor in the northwest corner of the state property, where another pipeline was to be installed (Herder et al. 1996:3, 10). No archeological resources were identified within the proposed parking area, but two ceramic scatters were recorded as isolated occurrences within the pipeline corridor (Herder et al. 1996:192). In May 1996, a trench for a telephone line on the north boundary of the site hit a gasoline pipeline. A subsequent survey of the spill area did not identify any artifacts or features (Ing and Bryan 1996).

TPWD archeologist Margaret Howard directed a pedestrian survey covering 500 ac at Hueco Tanks in 1999 and 2001. The investigations focused on three tasks: 1) intensive pedestrian survey of the level ground around the rock hills, 2) reconnaissance of the lower elevations of the hills, and 3) recording and sample collection in areas defined as archeological localities. Because the entire property is designated as one site (41EP2), archeological localities

were defined within it to encompass areas where the densities of cultural materials and features are relatively high. In areas where the cultural deposits are extensive, locality boundaries were arbitrarily set at natural and/or constructed landmarks, to delineate smaller units for analysis and management. The 29 localities were numbered sequentially within six geographic areas designated by prefixes: CA (Central Area); ES (East Strip); NE (Northeast Area); NW (Northwest Area); SB (South Basin); WS (West Strip). A total of 163 sheltered areas with evidence of cultural use was documented. Other cultural features recorded on the lower elevations of the rock hills were rock imagery, 399 bedrock grinding features (mortars, cupules, and metates), 125 fire-cracked rock features, and 10 water retention features. While not every one of these features can be readily dated to the Formative period, most are located in proximity to Formative period artifacts, Jornada rock imagery, and/or known pithouse/pitroom locations and are attributable to Jornada Mogollon occupations at the site.

The data and materials recovered from the 1999-2001 investigations were analyzed, and all of the previous investigations at Hueco Tanks also were reviewed. A total of nearly 4,100 artifacts was examined during this project. Ceramic clay source areas were ascertained through instrumental neutron activation analysis of pottery sherds, and radiocarbon dates were obtained from corncobs and other organic materials recovered from the Site (Howard et al. 2010). Based on the number of Formative period cultural features and artifacts examined during the 1999-2001 investigations by Howard and her team, it can be said that Hueco Tanks contains by far the largest assemblage of Formative period archeological deposits of any Jornada Mogollon rock imagery site.

Also in 1999, TPWD contracted with Evelyn Billo and Robert Mark of Rupestrian CyberServices to create a digital rock imagery database for Hueco Tanks. They recorded 273 panels, including 34 which were discovered during the project (Harry et al. 2001:154). The panels were designated by prefacing Forrest Kirkland's aforementioned designations with letters indicating the mountains where the panels were found and adding leading zeros to rock imagery site numbers below 10. Each panel was photographed, mapped via global positioning system (GPS), and entered into a geographic information systems (GIS) database. Billo and Mark also compiled a portfolio of ca. 6,000 images, including photographs by John Davis, Kirkland's paintings, and other existing records. In the process of scanning and filtering the photographs they took in 1999, Mark discovered that digital color enhancement revealed pictographs that were invisible or nearly invisible to the naked eye (Mark and Billo 2002, 2006:12-14).

Other small projects were undertaken by the author between 2001 and 2005, during which time he conducted two surveys related to construction of an interpretive trail (Roberts 2002, 2005a). In 2001, the author examined a 457-m long trail segment that was to be rerouted along an existing gravel road. Ground-disturbing impacts were limited to the foundations of two pedestrian bridges that would span an arroyo. Roberts surveyed the proposed trail segment and excavated soil probes, which hit disturbed sediments. He dug test units at the locations where the bridge abutments were to be placed, recovering a mixture of recent materials and prehistoric artifacts (Roberts 2002:98-102). In 2004, the author surveyed the ends of a large earthen dam between North and West Mountains that were being cut down by bulldozers to

allow for emergency vehicle access (Roberts 2005). The dam was comprised of sediment from an extensive borrow pit to the east, where a Formative period village or hamlet reportedly had been located (Roberts 2005:65; Sutherland 1996:72). Screening of substantial quantities of sediment from the bulldozer cuts produced only modern materials, but a visual examination of the dam's surface beyond the immediate project areas revealed El Paso Brown, Bichrome, and Polychrome rim sherds, Chupadero Black-on-white body and rim sherds; body sherds of Playas Red, Mimbres Boldface, and corrugated wares; chipped and ground stone artifacts; and fire-cracked rocks (Roberts 2005:66-67). The author also surveyed the margins of the borrow pit. He observed artifacts similar to those exposed on the dam, and collected one obsidian arrow point typed as Harrell. The author concluded that at least part of the sediments comprising the dam represented a Formative (possibly Doña Ana) occupation that had been located between the mountains (Roberts 2005:71-72).

In 2010, TPWD contracted with a team of conservators and scientists from Conservation of Sculpture and Objects Studio in Illinois, the Philadelphia Museum of Art, and the Bruker Corporation in Massachusetts, to begin treating graffiti that overlies rock art, using portable lasers. First, non-invasive techniques, including X-Ray Fluorescence, Raman Spectroscopy, and Fourier Transform Infrared Spectroscopy, were used to analyze the pictograph pigments and binders, while samples of graffiti paint not directly on pictographs were removed and tested in a laboratory to determine their composition (Lins and Price 2011). The results were used to create test samples and calibrate portable lasers for treating the graffiti. Then, in 2011, after tribal consultations, lasers were

successfully used to remove spray painted and brush painted graffiti from on top of pictographs at Hueco Tanks without harming the underlying Native American paintings (Dajnowski and Dajnowski 2011).

In 2016, TPWD commissioned an extensive photographic survey of climbing routes at Hueco Tanks by Versar of Springfield, Virginia, and researchers also applied a decorrelation stretch image enhancement algorithm (DStretch) to each survey photograph to determine whether previously unidentified Native American pictographs are present in any of these locations. Researchers examined approximately 2,000 climbing routes, revealing previously unknown rock imagery at 29 locations (Goodmaster et al. 2017). TPWD has closed these areas to climbing. The final report for this project (Goodmaster et al. 2017), was completed in the summer of 2017.

RESULTS

Archeological Survey of Recently Discovered Pictograph Locations

An archeological survey of 19 locations on North Mountain, 3 on West Mountain, 8 on East Mountain, and 4 on East Spur where the use of DStretch recently revealed previously unknown pictographs or remnant pigment (Goodmaster et al. 2017) did not reveal any archeological deposits or other cultural features. In most cases, the floors of these settings were bedrock; others had very shallow loess sediments (<5 cm) with no apparent archeological materials.

Monitoring of Select Burned Rock Features

Utilizing photographs and hand-drawn maps from the 1999 and 2001 surveys, TPWD was able to relocate all but one of the 79 burned rock features (i.e., hearths) that were the focus of the present investigation; the single

hearth that was not relocated was west of West Mountain in archeological locale WS3. In addition, ongoing deflation of the landscape within the project area exposed 44 previously unknown hearths (Table 1). All features were mapped, photographed, and their current condition assessed. In the process of locating and documenting these features, seven temporally diagnostic artifacts or uncommon items were recovered for curation (Table 2; Figures 2-5), none of which were found in direct association with any of the burned rock features. No other artifacts were collected during this investigation. The feature totals are shown, by archeological locale, in Table 1.

Table 1. Number of known and newly recorded hearths by locale and associated artifact recovery.

Locale	Known Hearths	New Hearths	Artifacts Recovered
NW1	2	0	0
WS2	76	42	6
WS3	1*	2	0

* not relocated in 2018



Figure 2. Projectile points recovered during the 2018 hearth condition assessment.

Table 2. Collected artifacts.

Artifact Type	Age	Locale
Hueco dart point fragment	Late to Transitional Archaic 3,000 – 1,700 BP (MacNeish 1993)	WS2
Hueco dart point	Late to Transitional Archaic 3,000 – 1,700 BP	Near CA3
Unidentified corner-notched dart point	Probable Late Archaic	WS2
El Paso bi-chrome pottery sherd	Late Prehistoric	WS2
Chupadero black-on-white pottery sherd	Late Prehistoric	WS2
Obsidian pebble (“Apache Tear”) graver/scrapper	Unknown	WS2
Crinoid fossil, probable bead	Unknown	WS2

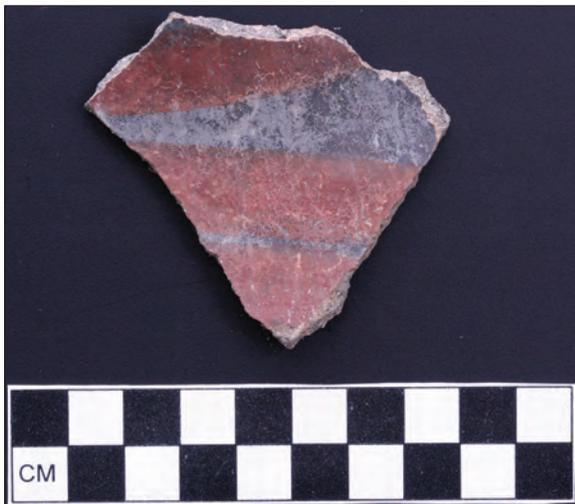


Figure 3. El Paso Bi-chrome sherd, exterior.



Figure 4. El Paso Bi-chrome sherd, interior.

Temporally diagnostic artifacts recovered during the present project include three projectile points, including two Late to Transitional Archaic Hueco dart points (one of which is a heavily reworked fragment)

and one unidentified, probable Late Archaic corner-notched dart point (left to right in Figure 2). All three projectile points were manufactured from fine-grained cherts. Other items collected for curation included



Figure 5. Crinoid fossil, Apache tear, and Chupadero black-on-white sherd.

a Late Prehistoric El Paso bi-chrome pottery sherd with exterior and interior decoration (see Figures 3 and 4), a Late Prehistoric Chupadero black-on-white sherd, an obsidian pebble or “Apache Tear” graver/scrapper, and a crinoid fossil that was likely utilized as a bead (see Figure 5). All artifacts, as well as archival documentation generated during the present investigation are curated at the TPWD Archeology Laboratory in Austin.

CONCLUSION

Archeological Survey of Recently Discovered Pictograph Locations

No further work is recommended in association with the archeological survey of recently discovered pictograph locations at Hueco Tanks State Park and Historic Site.

Monitoring of Select Burned Rock Features

The 2018 investigation included the attempted relocation, mapping, and current condition assessment of the total of 79 previously identified burned rock features in archeological locales NW1 (n=2), WS2 (n=1), and WS3 (n=76). More recently exposed features were documented in the process. Similar work will be conducted within the remaining eight archeological locales known

to contain burned rock features in April 2019. Once these features have been documented, a Scope of Work will be prepared by TPWD, in coordination with the THC, outlining plans to excavate a cross-section of burned rock features from various archeological locales within Hueco Tanks. It is anticipated that these excavations would begin as early as May 2019, and at a minimum would include the excavation of a 10% sample of the known burned rock features. At present, that would include the excavation of at least 17 of the 169 known burned rock features. This data recovery would be considered mitigation for the anticipated ongoing erosion of the remaining features. However, in the summer of 2019, TPWD also plans to re-seed areas where burned rock features are concentrated, with native grass seed, in hopes of establishing vegetation that will slow the rate of erosion in these areas.

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CULTURAL RESOURCES INVESTIGATION AND RECOMMENDATIONS FOR THREE SITES AT LAKE SOMERVILLE STATE PARK, NAILS CREEK UNIT, LEE COUNTY

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ABSTRACT

Texas Parks and Wildlife Department recorded two new archeological sites (41LE351 and 41LE352) and revisited one previously recorded site (41LE315) at Lake Somerville State Park. During the investigations, 56 shovel tests were excavated within a combined area of 11.1 ac. Site 41LE352, consisting of a moderate sized foundation and a water diversion feature, was shovel tested and recorded. Eligibility for listing on the National Register of Historic Places is unknown, and additional testing is recommended to make a determination. After examination and shovel testing of 41LE351, it was determined that lithics eroding out of a road cut are all in secondary deposition indicating that the site has been heavily disturbed, with no intact deposits. Based upon the disturbed nature and secondary deposits, site 41LE351 is not NRHP eligible under any of the criteria. Site 41LE315, which was previously recorded in 2001 and determined ineligible for listing on the NRHP, was expanded to encompass new cultural materials recorded during these investigations. Further testing is recommended to reevaluate the eligibility of this site.

INTRODUCTION

In December 2016, Texas Parks and Wildlife Department (TPWD) determined that park visitors were surface collecting artifacts at Nails Creek Unit of Lake Somerville State Park in Lee County (Figure 1). The park is owned by U.S. Army Corps of Engineers (USACE) and is operated by TPWD under lease. A shovel test excavation subsequently recovered lithic debitage in the area at 0-80 cmbs. Between April and August of 2017, TPWD archeologists excavated 28 additional shovel tests to assess the site's significance and evaluate its spatial extent.

In February 2017, while investigating a possible prehistoric site identified by staff, TPWD archeologists discovered a historic foundation and prehistoric lithic scatter. The feature initially discovered by park staff was

determined to be a historic water feature along Nails Creek rather than a prehistoric burned rock midden, as originally reported. At that time, a reconnaissance level survey was conducted and three shovel tests were excavated. Based on the results of the reconnaissance survey and positive shovel tests, TPWD archeologists conducted an intensive pedestrian survey with shovel testing at both locations in April and May of 2018.

ENVIRONMENTAL BACKGROUND

Lake Somerville State Park is comprised of 5,200 ac and consists of the Birch Creek Unit on the north side of the lake and the Nails Creek Unit on the southwest side. These units are connected by the 21-km long Lake Somerville Trailway. The northern portion of the complex is located in Burleson County,

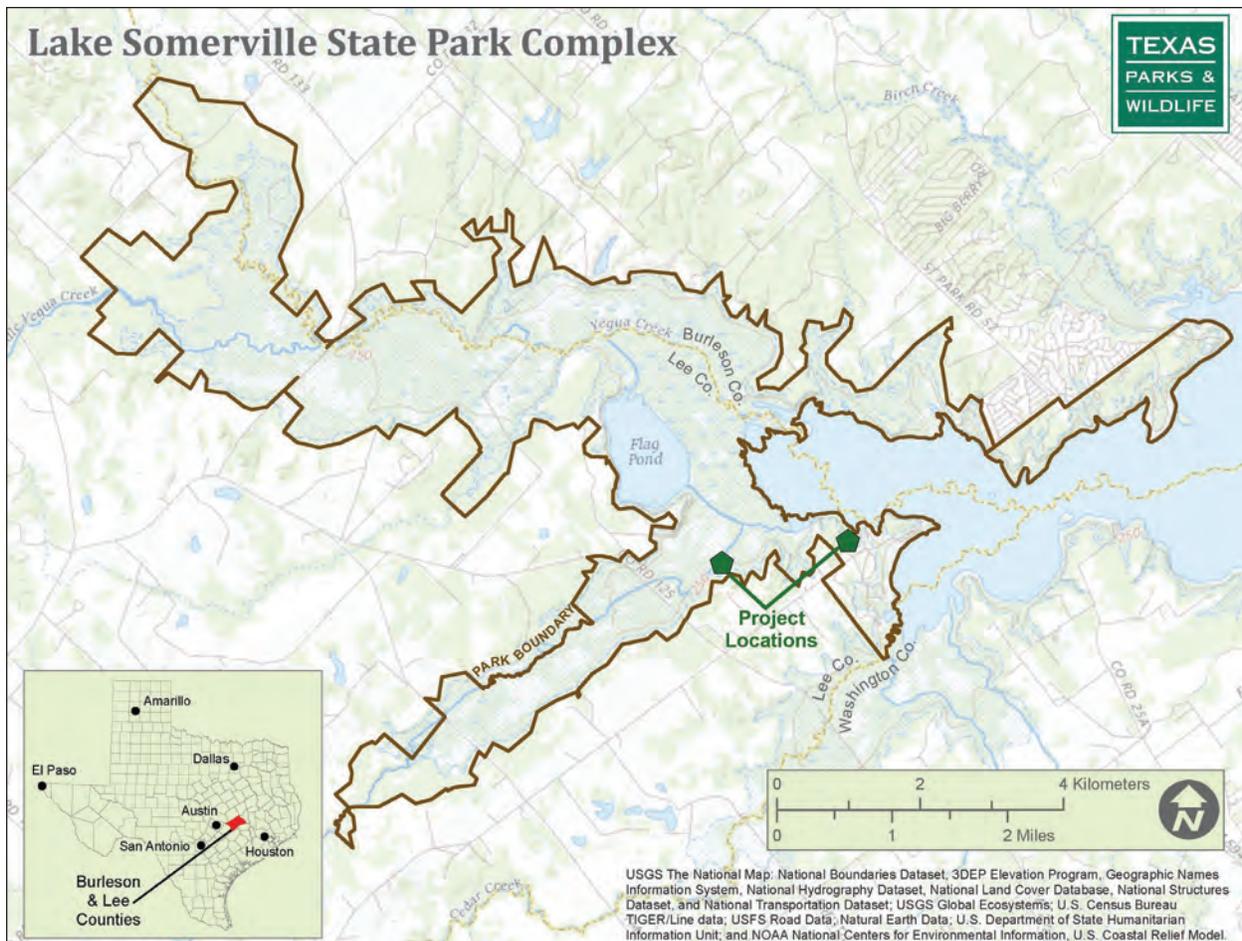


Figure 1. Project location map.

and the southern part is in Lee County. The project area is located in the Lee County part of the park.

The project area is underlain by Quaternary alluvial flood deposits adjacent to Tertiary aged sandstone of the Wellborn Formation. These sandstone formations form ledges and are common throughout the formation (USGS 2018). Soils for the project area consist of Sandow Loam, 0-1% slopes frequently flooded adjacent to Burlewash Koether Soils, 8-45% slopes – very stony (Natural Resources Conservation Service [NRCS] 2018).

Physiographically, the park is located in the Post Oak Savannah subregion of the Gulf Coastal Plains in an area generally known as the Texan Biotic province (Blair 1950).

The Post Oak Savannah is dominated by native bunch grasses and forbs including little bluestem, silver bluestem, sand lovegrass, beaked panicum, three-awn, and spranglegrass with scattered post oaks, live oak, and blackjack oak. Cedar elm, mesquite, eastern red cedar, hackberry, yaupon, American beautyberry and dewberry are also common (McMahan et al. 1984:2, 19). Rainfall in the area amounts to 90-115 cm a year. Elevation ranges from 90-240 m above sea level.

CULTURAL BACKGROUND

The Lake Somerville area falls along the eastern border of the Central Texas archeological region (Kenmotsu and Pertulla 1993), alternatively, within the East-Central

Texas archeological region (Mahoney et al. 2003). Archeological sites recorded in the immediate area span the entirety of the known periods of occupation in East-Central Texas. As such, this brief section outlines the general cultural chronology for the region. A more detailed account of these prehistoric periods, as well as the entirety of the cultural chronology for Central Texas and East-Central Texas can be found in Collins (2004) and Prewitt (1981).

The Paleoindian period (11,500-8,800 BP) commences during the latter part of the Pleistocene geologic epoch and terminates during the early Holocene climatic interval (Ensor and Carlson 1988; Johnson and Goode 1994; Perttula 1999); conceptually that era in prehistory wherein humans first entered the New World. Due to the frequent location of isolated finds of Paleoindian projectile points and the infrequent encounter of dense occupational features, it is generally inferred that these people were highly mobile, nomadic hunters and opportunistic gatherers. Recent research (Bousman et al. 2004; Collins 2004), however, is continuing to further define and refine our understanding of these early peoples, including their subsistence base and adaption patterns.

Technologically, the Paleoindian period is divided into early and late phases. The early phase is typified by the presence of fluted lanceolate points (i.e., Clovis and Folsom) produced of non-local material. The exotic stones recovered from these sites further suggest a high-mobility culture. The late phase of this period exhibits dart points, such as San Patrice and Dalton, made primarily of local materials (Ensor and Carlson 1988:18; Schambach 1998). The presence of woodworking tools, such as the Dalton adze, in association with these new variant dart points suggest a slightly more sedentary culture than its predecessor.

The Early Archaic period (8,800-5,600 BP) is characterized by the apparent onset of sedentary subsistence indicated by the diversity of recovered artifact assemblages (Collins 2004). The extinction of large herds of megafauna and the changing climate at the beginning of the Holocene appears to have stimulated a behavioral change in the prehistoric inhabitants of the region. While the basic hunter-gatherer adaption probably remained intact, an economic shift away from big game hunting was necessary. In general, more extensive exploitation of local resources such as deer, fish, and plant stuffs is indicated by greater densities of ground stone artifacts, burned rock cooking features, and more specialized tools such as Clear Fork gouges and Guadalupe bifaces (Turner and Hester 1993). Temporally diagnostic projectile points of this period include Angostura, Gower, and Martindale.

The Middle Archaic period (5,600-4,200 BP) occurred during the final years of the Middle Holocene geologic epoch and may represent a time of transition in adaption patterns. During the early part of this period, bison were again present along the plains and prairie regions of Texas after nearly a three millennia hiatus (Dillehay 1974). Their appearance was short-lived, however, and by approximately 5,200 BP bison had once again disappeared from the faunal assemblage of the Southern Plains and adjoining prairie margin. The continuance and proliferation of relative sedentism and/or specific exploitation of localized natural resources is evidenced by the continued occupation and reoccupation of preferred landforms (Mahoney et al. 2003). Johnson and Goode (1994) also point to the specialization of targeting specific natural resources, possibly xerophytic plants. These characteristics, in response to an increasingly drier environment (Bousman 1998; Johnson 1995), would form the basis

for the transformation in the overall stylistic tradition to that of the Late Archaic.

The Middle Archaic is technologically divided into two phases. The early phase is typified by thin-bodied, broad-bladed projectile points such as the Early Triangular variety. It is postulated (Collins 1998) that these points were part of a stone tool kit customized for hunting the abundant bison of this early phase. The later phase of the Middle Archaic is dominated by narrower bladed and thicker bodied dart points such as the Nolan and Travis varieties. It remains unclear whether this technological change can be directly attributable to the economic shift from bison procurement to medium-sized game procurement, such as deer and antelope.

The Late Archaic period (4,200-1,200 BP) roughly coincides with the beginning of the Late Holocene geologic epoch and represents the final three millennia of the Archaic Era. Johnson and Goode (1994:34), divide the Late Archaic into two separate phases, with a point of demarcation at approximately 2,600 BP. The earlier phase, or Late Archaic I, commences with generally xeric conditions, probably correlative with the Dry Edwards Interval to the west. Palynological evidence from the nearby Boriack Bog (Lee County, Texas) and the Weakly Bog (Leon County, Texas) reveals relatively low arboreal canopy cover, indicating a predominant grassland environment for the region during this period (Bousman 1998). Adaption to a relatively dry climate with low precipitation and high temperatures are hallmarks of the early part of the Late Archaic, with bison reappearing in the faunal assemblage following an over one thousand year hiatus (Dillehay 1974). Projectile point styles of this phase include, in progressive order, Bulverde, Pedernales, Marshall, Montell, and Castroville (Johnson and Goode 1994).

The Late Archaic II witnessed a continued population increase (Prewitt 1985; Rogers and Kotter 1995) and divergent burial practices possibly influenced from cultures to the east (Johnson 1995:96-98). Palynological data derived from the above bog studies indicate a trend toward a more mesic environment during the latter phase of the Late Archaic (Bousman 1998). Burned rock middens declined in usage during this time (Johnson and Goode 1994); however, recent research (Mauldin et al. 2003) questions the applicability of this period or phase marker. Typical projectile points of the Late Archaic II include Marcos, Ensor, Frio, Darl, and Figueroa (Johnson and Goode 1994).

The Late Prehistoric period (1,200-300 BP) represents the final few centuries prior to European contact in East-Central Texas, and exhibits a distinctive shift in technology from the previous periods. Evidence of bow and arrow weaponry first appeared in this period, with small arrow points appearing in the archeological record. The initial 600 years of this period, termed the Austin interval, is marked by the presence of expanding stem arrow points such as Scallorn and Edwards (Prewitt 1985). Environmentally, little change from the Late Archaic II is witnessed during the Austin interval, as faunal assemblages appear similar (Colling 2004).

The terminal Late Prehistoric subperiod, the Toyah interval, witnessed the return of bison to the region after several hundred years absence (Dillehay 1974). The animals' return resulted in a marked economic shift toward intensive bison procurement and processing (Prewitt 1981). The material culture from this interval reflects this shift with contracting stem arrow points such as Perdiz and Clifton, as well as blade technology. In addition, bone-tempered pottery makes its first appearance in the region during this interval.

The first settlers in this area began arriving in 1821 when Stephen F. Austin brought in the first 300 colonists and settled them around Yegua Creek and the Brazos River. Growth in this area continued up until the Texas Revolution and then accelerated after the formation of the Republic of Texas (Jackson 2001). Many of the new settlers brought their slaves with them. These early settlers grew mostly wheat and corn. Cotton growing was introduced in the 1850s and by the 1920s became the number one cash crop. Livestock consisted of cattle, hogs, and sheep (Jackson 2001; Long 2001).

The slavery population of the area increased during the Civil War, as farmers from the south fled into Texas bringing their slaves with them. After the Civil War, during reconstruction, as the area settled into an economic depression, many people turned to cattle rustling and stealing horses, operating along the sheltered areas of Yegua Creek and its tributaries (Christian 1962). By the early 1870s, the economy began to recover and these activities decreased. Like before the Civil War, many of the immigrants came from the southern states, but this time they were of African-American descent. Unable to afford their own land, most of the newcomers became tenant farmers. Those who could afford land soon began to cultivate cotton in the bottomlands of the many creeks in the area (Jackson 2001).

During reconstruction, African-American settlers migrated to the Nails Creek area from Burleson, Fayette, and Washington Counties, drawn by the offer of inexpensive land (Thompson 2002b). Communities such as Sweet Home, Post Oak, Antioch, and St. Mary started popping up in response to this migration. Most of these settlers were tenant farmers, cultivating mostly grain and cotton necessitating the need of a grain and cotton mill which operated by

Sweet Home residents on the banks of Nails Creek in the late 1910s (Thompson 2002a). Some settlers supplemented their income by working at neighboring plantations such as Black's Quarter (Thompson 2002b). A stagecoach and one-room school was operated near Nails Creek in Sweet Home (Thompson 2002a). One-room schools also operated in Post Oak and Antioch (Thompson 2002a, 2002b). In the 1920s, many of these communities declined due to the downturn in the cotton industry and the great depression. While the area never regained the resident population, many of the descendants of those early settlers still inhabit the area today (Lee County Historical Survey Committee 1974).

Previous Investigations

The first archeological investigations in the immediate area were conducted by Honea (1961) in response to the USACE creation of Lake Somerville in the 1960s. The Texas Archeological Salvage Project, conducted in January of 1961, resulted in the recording of 29 prehistoric archeological sites (Honea 1961). Numerous surveys were conducted in the Lake Somerville vicinity in the 1980s, primarily for petroleum exploration-related cultural resource clearances. In the vicinity of the Nails Creek Unit, three such surveys were conducted by Prewitt & Associates. These investigations resulted in the recording of one prehistoric archeological site (Fields 1983, 1985; Hannum 1985).

Alston Thoms of the Center for Ecological Archaeology at Texas A&M University conducted field investigations at Lake Somerville State Park and Trailway in 1996 (Thoms and Ahr 1996), 2001, and 2002 (Thoms 2004). Surface and subsurface survey work at the Nails Creek Unit included systematic coverage of 300 ac including 275 shovel tests leading to the discovery

and recording of eight new prehistoric sites and two new historic sites. In addition, five isolated finds, consisting of only debitage, were recorded. Seven previously recorded prehistoric sites and two prehistoric/historic sites were re-examined.

Results from the Thoms investigations indicate that stone procurement and tool manufacturing, hunting-related tasks, and earth oven cooking were important prehistoric subsistence activities at most Lake Somerville sites (Thoms 2004). During Thoms' investigations of the prehistoric sites at Nails Creek, four sites are characterized as campsites with features. These sites tend to occur on hilltops and all contain fire cracked rock (FCR) features. Artifacts typical of these sites are bifaces, scrapers, cores, debitage and one adze. Six are identified as campsites and are found along terrace slopes and hilltops. These sites contain the same array of artifacts as the campsites with features but are lacking FCR features. Seven sites are defined as low density artifact scatters and are found along ridge summits and other places where the soils are thin and gravel or bedrock is exposed on the surface. These sites are characterized by corticated flakes and cores, indicating use as lithic procurement areas (Thoms 2004). Although no dart or arrow points were recovered during the Thoms investigations at the Nails Creek Unit, one arrow point was recovered in a previous investigation and years of reported artifact collecting has resulted in numerous collected projectile points.

Contents of historic sites found at Nails Creek are consistent with expectations derived from archival research of the area. However, ground visibility was poor, and features found here were often obscured by thick vegetation. Thoms (2004) notes that it is likely other structures may have remained undetected.

In January 2005, TPWD conducted an archeological survey for the proposed Nails Creek and Flag Pond access project, consisting of vehicle parking areas and two new vehicular access roads. A total of 40 auger borings was excavated within the project area. No cultural material was encountered (Mahoney 2005).

In 2015, TPWD staff and volunteers performed emergency archeological reconnaissance survey and post flood site assessment at the park. Thirty-six previously recorded archeological sites were revisited, 22 of these sites are in the Nails Creek Unit and Trailway. Three new sites were recorded, one being recorded in the Nails Creek Unit. The material at site 41LE337 suggests a tool manufacture area. TPWD recommended that subsurface archeological investigations be conducted at a future date to determine eligibility for listing on the National Register of Historic Places (NRHP; Mathews 2016).

METHODS

Prior to performing fieldwork, a comprehensive review of all available archeological reports and databases was conducted to identify all known cultural resources in the vicinity of the project area, including the Texas Archeological Sites Atlas (THC 2018) and TPWD files. In addition, the literature and archival review included TPWD park management and field collections and notes files. A limited review of deed records was conducted for the project area. Records from the Lee County courthouse were examined for property ownership and transfer in hopes of gaining a better understanding of past land usage through various ownership.

The field investigation consisted of a complete visual inspection of the project area. Shovel tests were excavated to

determine presence of subsurface deposits and to define site boundaries as necessary as ground visibility was almost completely obscured by vegetation. Shovel tests measured 30 x 30 cm and were excavated in 10 cm levels. Shovel tests were terminated when they reached bedrock, sterile clay, or were too deep for sediments to be removed by tool or hand (100 cmbs). Excavated material was screened through ¼" hardware cloth. Each shovel test was recorded on a TPWD standardized shovel test form.

Ten shovel tests were excavated at 41LE351, ranging in depth from 5 to 68 cmbs, 17 were excavated at 41LE352, ranging in depth from 14 to 100 cmbs, and 29 were excavated at 41LE315 ranging in depth from 15 to 100 cmbs. From each positive shovel test at sites 41LE351 and 41LE352, additional tests were excavated in each cardinal direction 10 m from the initial positive shovel test. Results of these tests directed subsequent tests at 10 m intervals continuing in each cardinal direction until two subsequent negative shovel tests were excavated or natural site boundaries were encountered (e.g., steep slopes or intermittent streams). Due to heavy vegetation and fallen trees and limbs, some test locations were moved slightly. At site 41LE315, shovel tests were initially placed at 10 and 20 m intervals from the original shovel test. However, when the site was found to expand north towards the existing boundaries of site 41LE315, shovel test intervals were increased. The site boundaries were ultimately established with a combination of negative shovel tests, surface artifact scatters, and landforms, including a moderately incised drainage that forms the perimeter of much of the site. All shovel test locations were mapped with a Trimble GeoXT GPS unit with submeter accuracy.

RESULTS

41LE315

This site is located on a low rise that would have overlooked Yegua Creek to the north prior to the creation of Lake Somerville. Where not developed, the area is densely wooded with live oak, juniper, cypress, elm, and woody shrubs. The ground surface visibility is less than 30% in most places, with exceptions along the shoreline, trails, and cutbanks, where visibility approaches 100%. Site 41LE315 was originally recorded in 2001 by the Texas A&M Center for Ecological Archaeology and described as a 35 m x 75 m lithic scatter consisting of flakes, a core, and a chopper recovered between 0-30 cmbs. The site was reviewed by the THC in 2004 and determined ineligible for listing on the NRHP.

In total, 29 shovel tests were excavated during the current investigation (Figure 2). Cultural material was recovered from 20 of the shovel tests at depths ranging between 0-100 cmbs. These include 129 pieces of lithic debitage, 74 pieces of burned sandstone, 4 cores, a hammerstone, a biface, and a historic whiteware sherd. Numerous fragments of unsilicified petrified wood that may have been removed as waste material from silicified nodules were also noted throughout the site in both surface and subsurface contexts. Although no diagnostic artifacts were recovered, the vertical and horizontal distribution of cultural material suggests the site may have several components. A possible feature consisting of a subsurface concentration of burned sandstone 20-30 cmbs was recorded in Shovel Test 16, and excavation of Shovel Test 19 was terminated at the surface of what may be a hearth at 60 cmbs. In places, the site likely has deposits deeper than 100 cmbs.

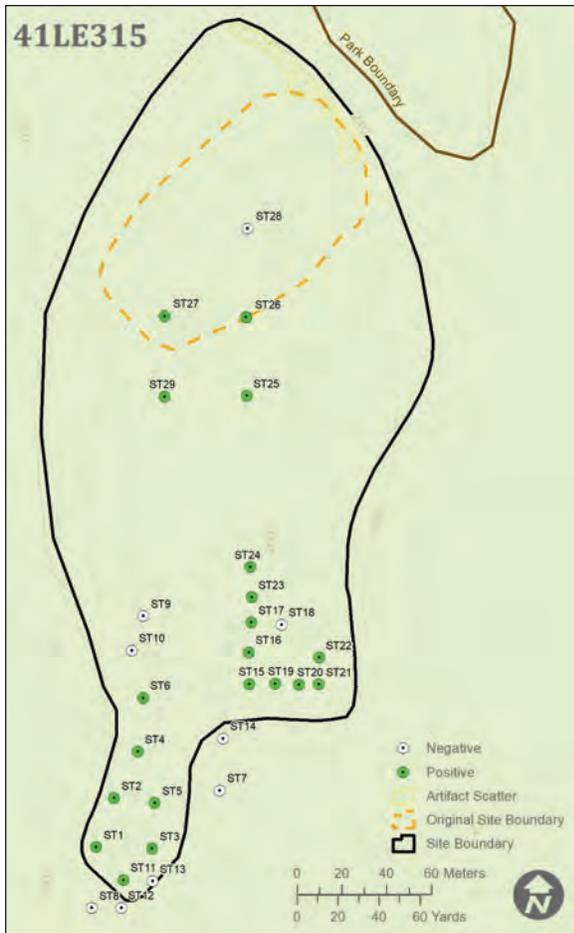


Figure 2. Site 41LE315 boundary with shovel test locations.

41LE351

Pedestrian survey of the area was completed to identify the presence of surface artifacts and to assess previous impacts. Surface visibility ranged from 10-80% with lower visibility on top of the landform. The vegetation consisted of short grasses and wildflowers on top of the landform surrounded by patches of live oak, juniper, cypress, elm, and woody shrubs. Artifacts observed included fewer than 10 flakes, 2 small cores, and a small scatter of burned rock.

Inspection of the project area revealed all surficial artifacts were concentrated along

the eroding edges of the landform, either near the road cut to the north or along an unnamed drainage that converges with Nails Creek to the west. In addition to the initial shovel test, nine more shovel tests were dug, producing one additional flake in Level 2 of ST 7. The shovel tests ranged from 5 to 42 cm before terminating at basal clay. One additional test was placed on a small landform to the southwest where additional artifacts had been spotted along the eroding surface. This test was excavated to 68 cm and was negative (Figure 3).

The area was found to be heavily impacted by weather, erosion, and/or use as a borrow area. Also, the area has been flooded multiple times as evidenced by the flood debris and limbs littering the area. All artifacts appear to be in secondary deposition and indicate that the site has since been heavily disturbed, leaving no intact deposits.

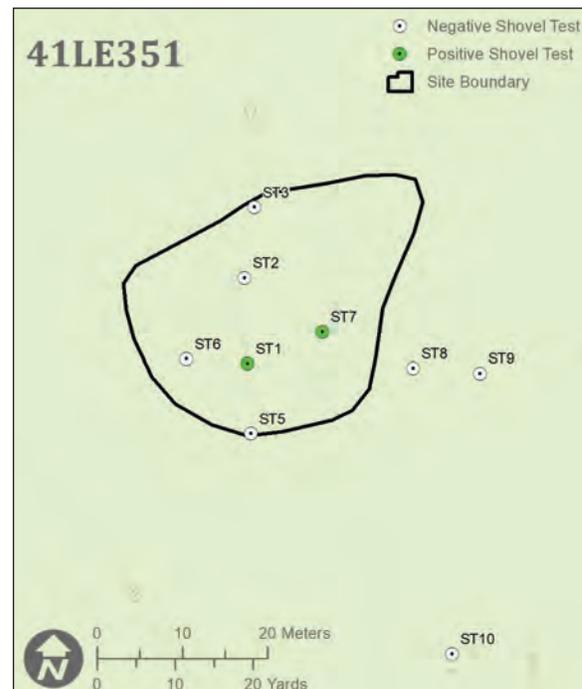


Figure 3. Site 41LE351 boundary with shovel test locations.

41LE352

This site includes a sandstone block foundation with an associated sandstone water feature. It is located on a terrace along the southern bank of Nails Creek, with an unnamed intermittent drainage approximately 25 m to the west and a prominent rise 83 m to the south/southeast. The entire terrace is littered with dead trees and fallen limbs from recent flood events. At the time of the current field investigation, the ground surface was completely obscured by vegetation that stood chest high in most places. Although park staff cut vegetation in the immediate perimeter and inside the foundation, the ground surface was still covered in vegetation with near zero visibility.

The sandstone block and mortar foundation is located approximately 1 m from the south bank of Nails Creek. The foundation measures approximately 7.5-m wide and 10-m long and is made of stacked sandstone blocks that measure 20-30-cm wide and 25-80-cm long. The walls are relatively straight with one to two courses visible on the south wall; the north wall is almost completely covered in flood sediment. A large tree is growing out of a portion of the south wall through a larger concentration of sandstone blocks that are fallen.

Seventeen shovel tests were excavated in and around the sandstone walls. An initial shovel test recovered one nail and hit sandstone chunks which were left in place at 10-16 cmbs. Sixteen additional shovel tests were excavated during the current investigation. ST 17 was excavated against the southeast corner of the foundation to determine the extent of the courses, as the area has been repeatedly covered in flood deposits. The test revealed two courses but was terminated at 27 cm so that large pieces of sandstone rubble encountered throughout would be

left intact (Figure 4). Based on the results of 17 shovel tests, the site extends 29 m east-west and 16 m north-south along Nails Creek (Figure 5).

Artifacts recovered from the 17 shovel tests include a nail from Level 1 of ST 1, an unidentified piece of ferrous metal from Level 1 of ST 2, 5 cut nails, 1 Albany slipped stoneware fragment, a piece of aqua glass, and a large unidentified piece of ferrous metal from Levels 2 through 4 of ST 5, a small piece of unidentified ferrous metal from Level 3 of ST 10, and a nail and a small piece of barbed wire from Level 1 of ST 11. Shovel Tests 3, 4, 6-9, and 12-17 yielded no artifacts.

Approximately 5 m east of the foundation is a sandstone concentration spreading approximately 3 m along the bank of Nails



Figure 4. Site 41LE352, ST-17, excavated against the southeast corner of the foundation to determine the extent of the courses.

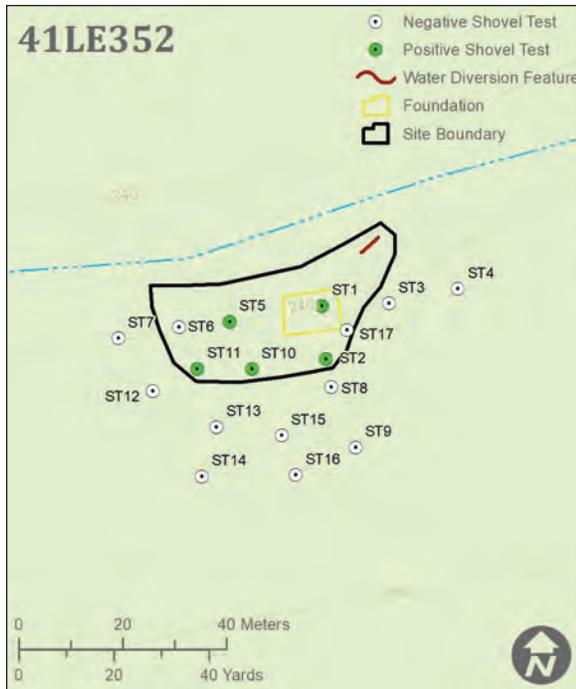


Figure 5. Site 41LE352 boundary with shovel test locations.

Creek and extending approximately 4 m down the bank into the water. Due to the steepness of the bank, the feature could only be examined from the top. The stones are of various sizes and don't appear to be machine cut. No mortar was observed on this feature.

As the feature was being examined from the top of the bank, a boat with three fishermen offered the use of their sonar to determine the depth and length of the feature. The stones extend approximately three quarters of the way across the creek. The depth of the creek on the west side of the feature varied from 1.0-1.5 m, becoming shallower approaching the feature. The depth on the east side started at 2.4 m and became increasingly shallower. This was initially thought to be the remnants of a retaining wall, further inspection revealed it was most likely a water diversion feature extending partially into Nails Creek creating a swimming or fishing hole.

CONCLUSION

41LE315

Although site 41LE315 was determined ineligible for listing on the NRHP in 2004, the site boundaries have been expanded to encompass additional deposits recorded during this investigation. Therefore, additional work is recommended to reevaluate the potential of the site for listing on the NRHP. Any future ground disturbing activities are not recommended within the current site boundaries, and if necessary, would require further archeological testing and/or monitoring by a professional archeologist.

41LE351

After examination and testing of this prehistoric site, it was determined that lithics eroding out of a road cut are all in secondary deposition indicating that the site has been heavily disturbed, leaving no intact deposits. Based on this, site 41LE351 does not meet NRHP criteria.

41LE352

This site features a historic sandstone foundation with an associated sandstone water feature. The use of sandstone to construct farmstead facilities was common during the late nineteenth and early twentieth centuries. The presence of cut nails, aqua glass, and Albany slipped stoneware also suggests occupation during this time period. This site is likely a late nineteenth to early twentieth century historic structure with an associated water diversion feature. Previously recorded historic sites in the Nails Creek Unit of Lake Somerville State Park have yielded assemblages of household items typical of turn-of-the-century and early-twentieth century farmsteads. In addition, deed records and oral histories support

this time period of occupation (Thoms 2004). Eligibility for listing in the NRHP is unknown. However, considering the results of this investigation, additional testing is recommended to make a determination.

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INTENSIVE CULTURAL RESOURCES SURVEY OF SIX BRUSH MANAGEMENT AREAS AT THE MCGILLIVRAY AND LEONA MCKIE MUSE WILDLIFE MANAGEMENT AREA, BROWN COUNTY

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ABSTRACT

Texas Parks and Wildlife Department plans to use state and federal funds to restore grassland wildlife habitat at eight locations at the McGillivray and Leona McKie Muse Wildlife Management Area in northeast Brown County. The project intends to use either a bulldozer or a skid-steer to clear existing juniper and mesquite brush, followed by seeding that may involve seed drilling, with soil disturbances at depths of 30-60 cm from the vegetation clearing.

Eight brush units totaling 91.4 ac were selected for the current restoration project, based on topography. A background review indicated that two of the brush units have been previously surveyed and cleared for brush removal activities, and that portions of two more units had been previously surveyed. This resulted in an actual survey area of six brush units totaling roughly 64.1 ac.

An intensive pedestrian survey was conducted in Fall 2018. This included the excavation of 55 shovel tests. During the pedestrian survey, two new archeological sites were recorded, and two previously recorded archeological sites were extended. Five isolated finds were also documented. Two of the prehistoric sites (41BR606 and 41BR616) were recommended for avoidance, including a 10 m buffer around the 41BR616 site area. The remaining sites and isolated finds were not recommended for avoidance.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) plans to use state and federal funds to restore grassland wildlife habitat at eight locations at the McGillivray and Leona McKie Muse Wildlife Management Area (WMA) in northeast Brown County (Figure 1). The project intends to use either a bulldozer or a skid-steer to clear existing juniper and mesquite brush, followed by seeding that may involve seed drilling, with soil disturbances at depths of 30-60 cm from the vegetation clearing.

Eight brush units totaling 91.4 ac were selected for the current restoration project, based on topography. Four of these are in the central part of the WMA, three are in the southwest part of the WMA, and one is in the west part. Work will either be conducted by WMA staff, or by a contractor with a WMA staffer present.

A background review indicated that two of the brush units have been previously surveyed and cleared for brush removal activities, and that portions of two more units had been previously surveyed. This resulted in an actual survey area of six brush units totaling

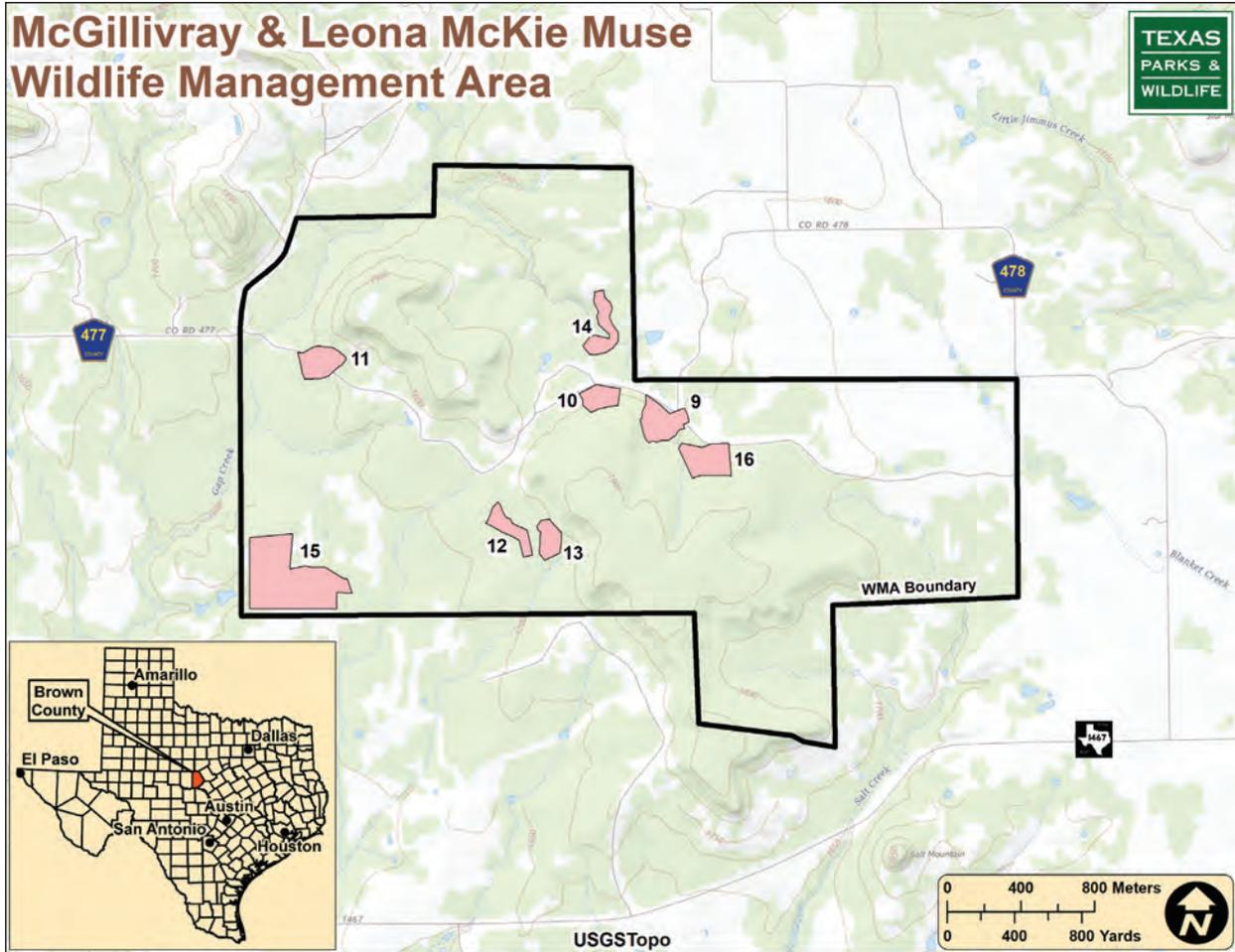


Figure 1. Topographic map showing eight survey areas in relation to WMA boundary.

roughly 64.1 ac. One previously recorded archeological site was present and a review of all previous reports of archeological survey at the WMA determined that several sites had been documented and reported on during previous surveys, but never formally recorded with the Texas Historical Commission (THC) Texas Archeological Sites Atlas (Atlas).

Soils across the six areas are largely shallow, rocky upland clay with varying degrees of slope. The geology of the WMA includes chert-bearing formations. Due to the proposed size of the project and depth of impacts, the presence of chert-bearing deposits, and the number of previously recorded archeological

sites in similar settings within the WMA (and the greater Edwards Plateau), an intensive pedestrian survey was recommended.

ENVIRONMENTAL BACKGROUND

The WMA is located within the western Cross Timbers section of the North Central Plains physiographic region of Texas, part of the Interior Lowlands of the Central United States. The habitat is classified as part of the western Cross Timbers Ecoregion of Texas (Gould 1962). Indigenous areas are covered in oaks and cedars. The upper story growth in abandoned fields are dominated by cedar and mesquite and brush.

The setting of the WMA encompasses two prominent mesas along the drainage divide between Blanket Creek to the east and Gap Creek tributary of Salt Creek to the west. The elevation across the WMA ranges from 588 m above mean sea level (AMSL) for the top of the mesas to 488 m AMSL for an unnamed tributary drainage of Salt Creek in the southwestern edge of the WMA.

The WMA is geologically dominated by three Lower Cretaceous Age formations. The Edwards Limestone Formation coincides with a pair of chert beds and limestone capping the tops of the two mesas. The Comanche Peak Limestone and Walnut Formation, which dominates the WMA, is mapped along the mesa slopes and lowlands north and east of the mesas within the Blanket Creek drainage and the northern parts of the Gap Creek within the WMA. Finally, the Antlers Sand Formation, composed mostly of sands and sandstone, occurs in the southwestern corner and south-central extension of the WMA, within tributaries of Gap Creek (USGS 2018). Brush management Areas 10, 12, 13, 14, and almost all of 11 occur within the Comanche Peak Limestone and Walnut Formation. All of Area 15 and a small portion of Area 11 occur within the Antlers Sand Formation. Abundant chert nodules exfoliated from the Edwards Formation around the rim of the two mesas commonly occur along the lower slopes and ridges in the surrounding areas.

The Brackett-Tarrant association, 8-30% slopes is the dominant soil type in almost all survey areas (NRCS 2018). This is the sole soil type in Areas 13, 14, and the to-be-surveyed portion of Area 10, two-thirds of Area 11, and 10% of Area 12. This soil association forms on the summits and backslopes of ridges, and is calcareous, gravelly, loamy residuum weathered from limestone. The typical profile of the Brackett component,

found on backslopes, is a surface layer of gravelly loam to 12 cm and a Bk layer of calcareous gravelly loam to 40 cm, overlying bedrock (NRCS 2018). The typical profile of the Tarrant component, found on ridgetops, consists of a gravelly clay loam to 35 cm and a Bk layer of calcareous clay loam from 35-72 cm, overlying limestone bedrock (NRCS 2018).

The other mapped soil type is Bolar-Brackett complex, 1-8% slopes. This is the sole soil type in Area 15, 90% of Area 12, and one-third of Area 11. This soil complex forms on the backslopes of ridges, and is calcareous, gravelly, loamy residuum weathered from limestone. The typical profile of the Bolar component consists of a gravelly clay loam to 35 cm and a Bk layer of calcareous clay loam from 35-72 cm, overlying limestone bedrock (NRCS 2018). The typical profile of the Brackett component is a surface layer of very cobbly clay to 25 cm overlying bedrock (NRCS 2018).

CULTURAL BACKGROUND

Human occupation of the Central Texas Hill Country began at least 11,000 years ago, with recent evidence suggesting that it may have started a couple of thousand years earlier. Archeologists generally recognize what are considered to be a series of culture changes, predominately through shifts in the morphology of diagnostic projectile points and other tools and the introduction of, and changes to, substantial features. Alterations in the material culture can be delineated and correlated to climatic changes to contribute to an understanding of human adaptations in the region.

The prehistoric cultural sequence is generally divided into three main periods: Paleoindian, ca. 9250 to 6850 B.C.; Archaic, ca. 6850 B.C. to A.D. 700; and Late Prehistoric, A.D. 700

to 1650, with subperiods delineated within each major period, reflecting distinctive archeological patterns (Collins 2004:112-113, 116-123).

The commonly accepted Paleoindian sequence in central Texas begins with the Early Paleoindian, which coincides with the end of the Late Pleistocene era and the extinction of Pleistocene megafauna. The sequence starts with the Clovis point, a distinctive long, thin, fluted lanceolate type, and an associated tool assemblage, dating from ca. 9250 to 8950 B.C. (Collins 2004:116). Once thought of as consisting solely of big-game hunters preying on mammoth, bison, camelids, and horses, Clovis subsistence is now known to be broad-based and diverse, including smaller game and plants (Bousman et al. 2004:75; Collins 2004:117). The Clovis period is followed by periods marked by Folsom, Midland, and Plainview points and assemblages, which date from roughly 8950 to 8050 B.C. (Collins 2004:113). This period is associated with intensive hunting of *Bison antiquus*, a larger Pleistocene ancestor of the modern bison, although other faunal remains are also found at sites (Bousman et al. 2004:80-82).

The Late Paleoindian period begins around 8000 B.C., with the onset of the Holocene era (Lohse and Bousman 2006:12). The Holocene brought dramatic changes, with warmer temperatures and wetter conditions, which were accompanied by shifts in settlement, mobility, subsistence, technology, and social practices (Bousman et al. 2004). The extinction of the Pleistocene megafauna necessitated a shift to smaller game. The wider variety and limited distribution area of Late Paleoindian compared to Early Paleoindian projectile point types indicates smaller settlement ranges (Lohse and Bousman 2006:12). Late Paleoindian diagnostic projectile point types

in Texas include Wilson, Dalton, St. Mary's Hall, Golondrina, Barber, and Scottsbluff. Wilson points are the earliest true stemmed projectile points in Texas, while the others are more traditional Paleoindian lanceolate points.

The Archaic period is marked by changes in material culture, subsistence, mobility, and other behaviors that persisted with only minor modifications for over 7,000 years. These include intensified hunting and gathering of local resources, including a greater reliance on plants. One of the most significant elements of Archaic lifeways is reflected in the increased use of hot rock cooking in hearths, ovens, and middens (Collins 2004:119; Lohse and Bousman 2006:13). There is a greater diversity in chipped stone tool types, including woodworking tools such as Clear Fork and Guadalupe bifaces, and ground stone technology becomes common (Collins 2004:119-120; Lohse and Bousman 2006:13). The Archaic period is subdivided into the Early Archaic (6850 to 4050 B.C.), Middle Archaic (ca. 4050 to 2050 B.C.), and Late Archaic (ca. 2050 B.C. to A.D. 750) periods (Collins 2004:118-121).

Early Archaic populations are thought to have been small and highly mobile, but large, extensive deposits at sites such as Wilson-Leonard (41WM235) in Williamson County, Gault in Bell County, and Kennedy Bluffs (41BP19) in Bastrop County suggest that these groups converged at favored places during certain times of the year (Lohse and Bousman 2006:13). Many Early Archaic components are situated near the eastern and southern margins of the Edwards Plateau, in the better-watered parts of the live oak savanna habitats (Collins 2004:119-120). Collins identified three projectile point style intervals for the Early

Archaic: Angostura, early split-stem (Gower and Hoxie), and Martindale-Uvalde (Collins 2004:119).

The Middle Archaic period starts around 4000 B.C., with a shift in the climate that is reflected in a change in lithic technology. A more mesic climate led to a significant increase in bison in Central Texas and movement of people from the prairie margins and woodlands, following the bison into central Texas. Their tool kit included specialized bison-hunting weaponry marked first by Bell, Andice, and Calf Creek points, followed by Taylor and Early Triangular points (Collins 2004:120; Johnson and Goode 1994:24-25).

The mesic period would end with the onset of the warm, dry Altithermal around 3000 B.C., during the Taylor-Early Triangular style interval. This shift to xeric conditions is associated with the introduction of the burned rock midden, a hallmark feature prominent across central Texas. Burned rock middens build up from the use of ovens that have rocks as heating elements, where xerophytic succulents such as stool were roasted. Over time middens accumulated on stable landforms as heavily fractured rocks are discarded (Collins 2004:121). The Nolan-Travis style interval, at the end of the Middle Archaic period, represents another technological shift away from the bison-hunting tool kit (Collins 2004:120-121). The xeric climatic conditions peak towards the end of this interval, although the dry climate of the Altithermal would continue for centuries (Collins 2004:115, 121).

The Late Archaic period began around 2000 B.C., following the peak of the Altithermal, and conditions would eventually become substantially more mesic (Collins 2004:121). Across Central Texas and much of Texas as a whole, the Late Archaic period saw more

intensive use of sites, indicating either increased populations, more frequent use of sites, and/or longer occupations (Johnson and Goode 1994:36; Prewitt 1981:73-74, 79-82).

Collins (2004:121) notes six style intervals for the Late Archaic, based on projectile points recovered from good stratified contexts. The first is the Bulverde type, followed by the Pedernales type, the most common dart point type in Central Texas (Turner et al. 2011:148), suggesting that population increases had become substantial. During the subsequent, slightly overlapping Lange-Marshall-Williams style interval, xeric conditions slowly begin to lessen (Johnson and Goode 1994:35). Marine shell ornaments begin to appear in Central Texas during this time, indicating probable contact with coastal peoples, or at least the existence of a trade network (Prewitt 1981:80). Bison may have reappeared in Central Texas during this interval, and were definitely present during the succeeding Marcos-Montell-Castroville style interval. While bison hunting contributed to overall diet, a broad-based subsistence was practiced (Johnson and Goode 1994:35-36; Prewitt 1981b:73-74, 81).

A rather significant shift in both projectile point styles and broader cultural practices begins around 600 B.C. (Johnson and Goode 1994:36); Prewitt (1981:81-82) also notes these changes but uses a much later start date. Collins (2004:122) summarizes these as “diverse and comparatively complex archeological manifestations” that attest “to the emergence of kinds of human conduct without precedent in the area.” Some causal factors that have been cited include population growth and influence from groups in the eastern United States. This is reflected in the archeological record by “ceremonial”

items including marine shell artifacts such as pendants and gorgets, elaborate bone ornaments, and atlatl weights and other stone objects of exotic material (Johnson and Goode 1994:37-38; Prewitt 1981:81).

The technological shift is reflected in the Ensor-Frio-Fairland projectile point style interval. These points are much smaller than the preceding periods, with narrow blades, and manufactured using more fine pressure flaking as opposed to broad billet flakes (Carpenter and Miller 2013:353; Johnson and Goode 1994:36). Both Ensor and Frio points are widespread across central and south Texas, while Fairland points are primarily found in central Texas; some analysts have noticed a gradation between these three point types (Turner et al. 2011:94, 99, 106).

The final interval of the Late Archaic is associated with Darl projectile points, a small, slender type. The Darl interval lacks exotic goods associated with extra-regional ties (Prewitt 1981:82), and there are also some indications that site occupations were less intensive (Carpenter and Miller 2013:352). In many ways, it seems to be an interruption of longer-term trends. Very little in terms of subsistence and economy changed from the Ensor-Frio-Fairland style interval through the Austin Phase of the Late Prehistoric (Johnson and Goode 1994:40).

The Late Prehistoric period begins in Central Texas around A.D. 700 (Johnson and Goode 1994:40) with the introduction of bow-and-arrow technology. This period is further divided into two distinct intervals: the Austin interval, followed by the Toyah interval (Collins 2004:122). Projectile point types associated with the Austin interval include Edwards, Scallorn, and Sabinal (Johnson and Goode 1994:40). Evidence of arrow-wound fatalities from burials suggests a possibility of widespread hostilities taking place during the Austin interval (Collins 2004:122-123).

The onset of the Toyah interval, around A.D. 1200, represents a significant shift in technology, cultural patterns, and subsistence base in central Texas (Collins 2004:123; Johnson and Goode 1994:41). Notably, these include the introduction of pottery (both locally produced and imported), prismatic blades, formal end scrapers, and thin beveled knives (Collins 2004:123). The dominant projectile point style is the narrow, strongly barbed, contracting-stem Perdiz arrow point, which is a distinctive design shift from the more triangular, expanding stems of the Austin phase arrow point types. The onset of the Toyah interval coincides with a drought that affected at least parts of the Edwards Plateau, during which bison herds moved south onto the Plateau (Johnson and Goode 1994:41). The artifacts associated with the Toyah interval are generally considered to be part of a bison procurement and processing toolkit (Prewitt 1981:74, 85), possibly originating from the Plains to the north (Johnson 1994:287). The pottery assemblage includes several locally-made, bone-tempered types: the common Leon Plain, and the rare Doss Red and Boothe Brushed (Creel et al. 2013:32). Imported pottery includes Caddo types from northeast Texas, found in small quantities across all of central Texas (Creel et al. 2013:33).

The Toyah interval continues in central Texas until roughly A.D. 1700, with the first documented arrival of Europeans (Collins 2004:123). By this time, however, consequences of the earlier arrival of Europeans elsewhere in North America were already occurring throughout Texas, notably the southern advance of Apaches mounted on European horses, the conquest of Mesoamerica by the Spanish, and the spread of European-introduced diseases (Collins 2004:123). These all contributed to numerous displaced groups making their way

into central Texas, such that the indigenous cultural patterns encountered by the early travelers and settlers do not represent direct analogs of prehistoric patterns. Indigenous groups in the area during the early stages of Euro-American exploration and settlement include Comanches of the Penateka band and Tonkawa (Leffler 2017; Lively 2017).

The initial Euro-American land survey was made in 1838, when the area was on the western frontier of Euro-American settlement of Texas, although the first settlers didn't arrive until 1856. This was the same year that Brown County was formed, with the county officially organized in 1858 and Brownwood as the county seat (Leffler 2017). Early settlement was relatively slow due to threats from Natives as well as white outlaws. The primary activity was cattle ranching, and continued to be throughout the nineteenth century, although farming also came to be a prominent activity, with some conflicts between the two groups over fencing of the previously open range (Leffler 2017).

By 1900, there were just over 16,000 people in Brown County, and 2,044 farms and ranches. Cotton was the primary crop, with 46,000 ac planted, followed by corn with 29,000 ac; other crops included wheat and oats. Cotton production peaked between 1908 and 1910, and declined rapidly following infestation by boll weevils. Peach and pecan orchards were common by 1910 (Leffler 2017).

Oil first was discovered in Brown County in 1879, although the first commercial production didn't occur until 1917, followed by an oil boom in 1926 that was curtailed by the Great Depression. New Deal programs helped alleviate conditions in the county; among the most prominent of these was the construction of Lake Brownwood and irrigation canals. World War II helped

revive the local economy, both through the construction of Camp Bowie south of Brownwood and the revival of the oil industry. In the postwar era, and through the second half of the twentieth century, the population grew fitfully. Oil continued to be a huge factor in the local economy, along with livestock ranching (cattle, goats, sheep, and hogs) and farming of wheat, oats, sorghum, and peanuts (Leffler 2017)

The town of Blanket, southeast of WMA, was originally settled in 1862, with a store established in 1873 and a post office in 1875. When the Fort Worth and Rio Grande Railroad was extended from Comanche to Brownwood in 1891, Blanket was moved from its former site to its present location. Over the course of the twentieth century, the town population has remained between 300 and 500, with 402 residents recorded in the 2000 census (Little 2017).

Previous Investigations

The earliest visit by a professional archeologist to the area of the WMA was conducted by State Archeologist Robert Mallouf on January 14, 1992, to make an informal chert collection from the southwestern side of three mesas on the WMA. Two sites were recorded during this visit. Site 41BR378 was recorded based on lithic debris exposed in several gullies in a fallow field. This site is reported to be a prehistoric lithic scatter of unknown affiliations with chipped stone flake debris exposed in several separate gullies extending over a 70 m east-west by 100+ m north-south area. Artifacts were observed extending to depths of 40 cm in the gully profiles, but no diagnostic implements were found. The site is to the northeast of Brush Unit 15. Site 41BR379 is a large quarry site, said to have hundreds of cores, tested cobbles, and large primary flakes. The site measures 60 m northwest-southeast by

200 m northeast-southwest, and is surficial with little potential for subsurface deposits. No temporally diagnostic artifacts were recovered, and the site likely represents long-term lithic procurement activity. This site is southwest of Brush Unit 10.

After TPWD acquired the property, former TPWD Archeologist Chris Lintz conducted several cultural reconnaissance surveys on the WMA. These included pedestrian inspections of the power line and headquarter complex (Lintz 2008), all existing roadways and north and east perimeter fence lines (Lintz 2010), surveys of the south and west perimeter fence line segments and the conference center/bunkhouse and public toilets (Lintz 2012a, 2012b). Thirty-four sites and localities were documented but not submitted for trinomials during these projects (Lintz 2008, 2010, 2012a, 2012b). Report maps were reviewed prior to this project and six sites/localities were noted as potentially present within the current project area and are discussed in the results. Portions of the road projects crossed Brush Units 11 and 14 and crossed between units 12 and 13. Portions of Brush Unit 15 were surveyed by a fence line project.

In addition, consultation with the THC was conducted for mesquite grubbing in three fallow fields, various brush cleared fallow fields across the WMA, and the placement of a storage shed at the headquarter complex. (Lintz 2016a, b, c). Eight sites were formally recorded during these projects. The three prehistoric sites include a late stage reduction area (41BR599), a knapping area around a large boulder (41BR604), and a site with two possible stone rings (41BR603). The five historic sites include an early can and glass scatter (41BR598), twin pond depressions (41BR600), a corral complex (41BR602), and two isolated stone walls (41BR601, and 41BR605). Sites 41BR599 and 41BR603 are

regarded as significant, and a corral complex, site 41BR602 has an unknown eligibility pending assessment of the residence and chiqueras area that are a part of an expansive site (Lintz 2016b). Avoidance was recommended for those three sites, and two more sites (41BR600 and 41BR605). One of the previous brush surveys included the eastern half of Brush Unit 10, the northeast part of Brush Unit 15, and the entirety of Brush Units 9 and 16. Sites 41BR600 and 41BR601 are near the current brush units.

In summer 2017, TPWD Archeologist John D. Lowe conducted an intensive pedestrian survey of roughly 100 ac spread over eight proposed brush management parcels (Lowe 2018). This survey identified six previously unrecorded cultural resource sites (41BR606-41BR611) and four isolated finds. Five of these are prehistoric sites, while the sixth dates to the late nineteenth century and beyond. Avoidance was recommended for two of the prehistoric sites, both open campsites, and for the historic windmill and trough features at the historic site. Two of these brush units are adjacent to proposed Brush Unit 14. Sites 41BR606 and 41BR609 are near Unit 14 and both were found to extend into this brush unit.

METHODS

On September 26th through 28th and October 1st through 4th, 2018, the author conducted an intensive pedestrian survey at the proposed habitat restoration areas. The weather was warm and sunny. The author walked transects across the project areas at 30-meter intervals, and excavated shovel tests arbitrarily across each of the project areas to assess potential for buried cultural deposits. Soils were shallow across most of the project areas, generally encountering bedrock between 5 and 15 cm below surface (cmbs). Some deeper soils (up to 40 cmbs)

were encountered in colluvial settings, as well as on a drainage divide that may have remnant alluvium. Surface limestone and chert gravels and small cobbles were abundant on the ground surface in most areas, and limestone bedrock outcrops were common.

Shovel tests measured 30 cm x 30 cm and were dug to a target depth of 50 cm, the anticipated depths of impact, or terminated when basal clay soils or bedrock was encountered. All sediments were screened through ¼" mesh screen. The soil colors, textures, and inclusions from each shovel test were recorded on a shovel test log. Each shovel test location was recorded using a Trimble GeoXT GPS unit. All shovel tests were backfilled following recording.

Fifty-five shovel tests were excavated across the survey areas. The THC minimum survey standards for a project of this size (11-100 ac) calls for one shovel test for every two acres, or 32 total tests. The current investigations exceeded this standard, primarily through the delineation of a large site.

All sites, isolated finds, and features were documented using photographs, field notes, and a GPS point. Isolated and highly dispersed lithic debitage was expected across the landscape, due to the presence of naturally-occurring chert cobbles combined with previous ground disturbances. Based on this probability, a density of two artifacts per square meter, with a minimum of 10 artifacts, was selected as the requirement for determining a site. Non-diagnostic isolated historic artifacts and prehistoric stone tools, following an examination of the ground surface in the vicinity, were noted but not documented. Temporally diagnostic artifacts, artifacts believed to be at risk of uncontrolled collection, and artifacts

recovered from shovel tests were collected and will be curated in the TPWD Archeology Lab curatorial facility.

RESULTS

Brush Unit 10 is a roughly 4 ac (maximum 170 m north-south by 220 m east-west), vaguely rectangular area south of the main ranch road in the central part of the WMA. Elevations range from 545-549 m AMSL, with most of the land sloping towards the unnamed tributary to the south.

Vegetation is relatively dense juniper, oak, and mesquite scrub and trees, succulents, and mixed grasses and forbs. Ground surface visibility ranged from roughly 10-100%, with higher visibility on the rocky slopes. The surface is covered with limestone pieces ranging in size from pebbles to small boulders, as well as poor-quality, blocky chert cobbles. Very few cobble testing flakes were noted across Unit 10, part of the sparse lithic landscapes common across the WMA.

Only two shovel tests were excavated across Unit 10 (ST 10-1 and 10-2), primarily in areas perceived to have some soil (largely colluvial). Both tests encountered silty clay loam soil, with the test in the lower area encountering basal clay at 20 cmbs and the test on the slope encountering limestone gravel bedrock at 15 cmbs. Both tests were negative for cultural material.

Unit 11 is an 8.34 ac (maximum 200 m north-south by 220 m east-west) polygon southeast of Gap Creek in the west part of the WMA. The survey area is bisected by the main gravel ranch road. Elevations range from 512 m AMSL along the west edge of the survey area to 533 m AMSL in the east edge; the landform is a series of stepped benches leading down to a more gently sloping upland plain. A small area along the gravel road in the east part of the unit has been

previously surveyed but was included in the current project for convenience.

Vegetation varies somewhat with slope, with patches of dense oak and juniper thicket in the lower, level areas and along the edge of the road, and bare rock with sparse grasses and succulents higher on the slope. Impacts to the area include grading of the road, probable past vegetation clearing, and erosion.

Three shovel tests were excavated across Unit 11 (ST 11-1 through 11-3), primarily on the lower areas where more soil was present. On the upland, tests encountered thin silty loam or silty clay loam soils overlying limestone gravel caliche bedrock at depths from 10 to 15 cmbs. Tests on lower parts of the area encountered dark grayish brown silty clay loam to 30 cmbs, ending at thick, calcareous clay. All tests were negative for cultural material.

No sites were recorded in Unit 11. As in much of the WMA, occasional lithic debitage was noted on the rocky upland surfaces, mixed with natural blocky chert and limestone gravels and cobbles (Figure 2). The debitage was not at a density of definitive cultural materials appropriate for designating the landscape as a site. Isolated find 18-1, a rock cluster with historic debris, was documented in this unit and is discussed later.

Brush Unit 12 is a 6.07 ac (maximum 320 m northwest-southeast by 120 m northeast-southwest) crooked rectangle area in the south-central part of the WMA, west of a ranch road. The unit is situated along a gently west sloping bench with an elevation range of 530-536 m AMSL. A minor wash is present in the southern leg of the unit, and the landform is situated between headwaters of two tributaries.



Figure 2. Limestone and blocky chert cobble landscape in Brush Unit 11. View to east.

Vegetation in the southern half of the unit was very brushy, with extensive briar as well as a lot of deadfall (Figure 3). The north half was rockier and more open, although some areas of relatively dense brushy woods persisted. In addition to the gravel road that forms the eastern edge of this unit, a second two-track road forms the northwestern boundary. The gravel road was previously surveyed by Lintz (2010), and one of his previously noted resources is present within Unit 12.

Only three shovel tests were excavated across Unit 12 (ST 12-1 through 12-3), due to the thin, rocky soil. Tests encountered gravelly loam or silty clay loam overlying limestone gravel bedrock at depths from 15 to 20 cmbs. All tests were negative for cultural material.



Figure 3. Brush and deadfall in south part of Brush Unit 12. View to west.

No sites were recorded in Unit 12. Four isolated finds were documented within the unit. Two of these are prehistoric artifacts, consisting of a distal thin biface fragment (IF 18-2) and a large probable blade core (IF 18-5); shovel test 12-3 was excavated near IF 18-2. The other two isolated finds are probable historic-aged campsite, including a beverage can scatter with a possible fire ring (18-3) and a large earthen dam/pond feature (18-4). This earthen dam is the resource noted by Lintz during his 2010 survey. These isolated finds are discussed in more detail below.

Brush Unit 13 is a roughly oval-shaped 5.28 ac (maximum 220 m north-south by 120 m east-west) area in the south-central part of the WMA, east of a gravel ranch road, and opposite Brush Unit 12. The western two-thirds of area is a long, relatively level

side slope bench with an elevation range of 536-548 m AMSL. The eastern third rises somewhat sharply to 536 m AMSL, with the far eastern edge stepping up to closer to 539 m. The headwaters of a tributary wash run southwest from the northeast corner towards the midpoint of the western boundary.

Vegetation was essentially two types. The southern third, and much of the central area, was sparsely to moderately covered with mixed grasses and forbs, succulents, and occasional oak and juniper. The northern third was dense thicket of oak, mesquite, juniper, briar, and other brushy trees. Previous impacts include vegetation clearing, construction of a deer stand, and maintenance and use of a short road from the ranch road to the hunting clearing.

Three shovel tests were excavated across Unit 13 (ST 13-1 through 13-3), targeting areas perceived to have sediments. All but one of the tests encountered clay loam overlying gravelly calcareous clay bedrock at depths from 15 to 20 cmbs; the exception was in a rocky area on the eastern edge, where shallow bedrock was encountered. All tests were negative for cultural material.

One site, 41BR617, was recorded in Area 13; this is discussed below and is possibly one of the resources documented by Lintz (2010). Very rare lithic debitage was noted across this unit, mixed with natural blocky chert and limestone gravels and cobbles, but not at a density sufficient to label as a site.

Brush Unit 14 is a 7.8 ac (maximum 320 m north-south by 180 m east-west) vaguely J-shaped area in the north-central part of the WMA. The unit is situated around a graded/dirt ranch road that runs north from the main road. The area is a mix of side slope benches, and level stream terraces/slope toes, with

elevations ranging from roughly 533 m AMSL around the drainage to 542 m in the southwest corner. An unnamed, probable spring-fed tributary to Gap Creek runs southeast to northwest, roughly bisecting the area.

Vegetation was varied depending on slope, proximity to drainage, and previous land use. The level southern benches were rocky with sparse grasses, succulents, and juniper brush. Slopes were thicker juniper, oak, briar, and grasses with some small clearings. The riparian zone west of the road was very thick, with some mature hardwoods and heavy brush understory. The terrace east of the road and south of the drainage had been cleared in the past and was now mixed grasses (Figure 4). Previous impacts include clearing, grading, use, and maintenance of the road and clearing of the small field south of the drainage, possibly for grazing.



Figure 4. Cleared grassy area in Brush Unit 14. View to north.

Six shovel tests were excavated across Unit 14 (ST 14-1 through 14-6), as this was one of the few areas with possible alluvium. The tests were generally deeper than in other areas, but still relatively shallow, with containing a brown to dark brown silty clay loam 20 to 30 cm thick, overlying calcareous gravelly clay loam. Three of the tests were dug either within a site or to delineate site boundaries. Five of the six tests were negative for cultural material. Test 14-1 in site 41BR606 was positive, recovering 25 flakes from two levels, mixed with various amounts of natural gravels.

Two previously recorded sites, 41BR606 and 41BR609, were found to extend into the Unit 14 area and are discussed below. Both sites were recorded by Lowe (2017) during a previous brush unit survey that included areas to the west and south of Unit 14. A low density lithic landscape, with occasional debitage mixed with (often naturally fractured) chert and limestone gravels and cobbles, is present in the northern part of the unit. These areas did not meet the criteria discussed in the Methods section for determining a site.

Unit 15 is a 32.6 ac (maximum 430 m north-south and 500 m east-west) L-shaped area in the southwestern corner of the WMA. The area is a broad, gently sloping upland plain that is dissected by various deep-cut washes in the southern portions (Figure 5). Elevation ranges from 482 m AMSL in the deep cut drainages along the western boundary to 509 m AMSL in the southeastern corner. Two branches of an unnamed tributary to Gap Creek are in the southwest corner and converge not far west of the WMA boundary, while another deep cut wash runs east across the southeast portion. Gap Creek is roughly 450 to 500 m west of Unit 15.



Figure 5. Deep cut drainage in south part of Brush Unit 15. View to east.

The vegetation on the broad plain was relatively open, with short grasses and forbs, succulents, and patches of juniper and oak. This area was almost certainly cleared in the past; a review of the Google Earth historic image slider, while blurry, suggests the area was almost bare of greenery in the early 1980s. A graded ranch road forms much of the eastern boundary of the unsurveyed area and crosses the southernmost 180 m; this road was surveyed by Lintz (2010). Other disturbances include previous vegetation clearing and some significant areas of erosion, construction and maintenance of the boundary fence lines, and fenceline roads. The boundaries were surveyed by Lintz (2012) and were resurveyed during the current project both for convenience and to investigate both unrecorded and previously noted resources.

Thirty-nine shovel tests were excavated during the survey of Unit 15 (ST 15-1 through 15-39), primarily during the delineation of an archeological site with buried deposits. Most tests encountered brown, dark brown, or yellowish brown silty clay loam to depths of 10 to 30 cm, overlying compact, yellowish brown or reddish-brown clay loam with some gravels. Ten of the 39 tests were positive for cultural material, recovering varying amounts of lithic debitage at depths up to 40 cmbs.

One site (41BR616) was recorded in Unit 15 and is discussed below. Lintz (2012) documented two historic sites resources (an earthen dam and a farm machinery dump) and a prehistoric resource (an open campsite with an arrow point) in Unit 15. These were either no longer present or determined not to meet the current criteria for designation as a site.

The following discusses each archeological site and then the isolated artifacts found in each brush management project unit.

41BR606

Site 41BR606 was originally recorded as a small (80 m east-west and 60 m north-south) prehistoric open campsite on a northwest projecting finger ridge/drainage divide between two possible spring fed tributaries (Lowe 2017). At the time, the eastern, western, and northern boundaries were largely determined by the landform/slopes. Two lithic concentration features were noted at the site. The moderate density artifact assemblage observed was overwhelmingly lithic debitage, with a small amount of probable limestone fire-cracked rock (FCR) and chipped stone tools including roughly five mid-to-late stage bifaces, a discoidal scraper flake tool, and a few cores. One dense, coarse quartzite flake removed from a groundstone tool was also noted.

Cultural materials were restricted to the rocky, deflated surface and mixed with abundant natural materials. The site was evaluated to be 20% to 25 % intact, having suffered from erosion and probable prior vegetation clearing. The research potential was considered low, and site 41BR606 was not recommended for official designation as a State Antiquities Landmark (SAL). No further archeological work was recommended, and no avoidance was required.

The extension to site 41BR606 was identified in the northwest part of Brush Unit 14, when a scatter of lithic debitage was noted on the surface. The scatter was followed to the northwest to determine whether it merited designation as a site, as well as to see if it was a continuation of a previously recorded site. During the inspection, two dart point fragments, a groundstone mano fragment, and a dispersed hearth feature were identified at the base and side slope of the landform with the previous site 41BR606 area at top, confirming this was an extension.

The site extension added an area 50 m north-south by 80 m east-west, extending east-northeast from the original boundary (Figure 6). Two additional features were identified in the site extension. Feature 3, located roughly in the center of the site, is a roughly circular hearth, 1.7 m in diameter, with a larger scatter closer to 2 m x 2 m (Figure 7). It consists of roughly 50 to 60 reddened, fractured fossiliferous limestone rocks, with 10 to 15 pieces greater than 15 cm in size, and the remainder mostly 5 to 10 cm big. There has been some erosion of scatter downslope to the north. A few flakes are present in the vicinity. The feature rests on top of a rocky, sloping surface and has no subsurface expression

Feature 4 is a dispersed FCR scatter covering a 10 m x 10 m on the eastern part of the site,

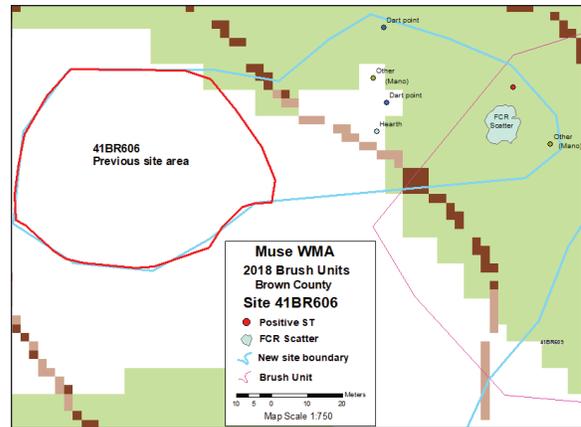


Figure 6. Site 41BR606 map showing extended boundary.



Figure 7. Site 41BR606 Feature 3, a deflated hearth. View to west.

towards the drainage. The scatter includes 80 to 100 FCR limestone pieces, mostly in the 5 to 10 cm and 10 to 15 cm range; there are some clusters on east and southwest sides. Also present within the feature area are at

least 20 flakes and some possible informal tool fragments. The feature is on a deflated, rocky surface.

Two temporally diagnostic projectile point fragments were recovered within the site extension (Figure 8). One is a mostly complete but heavily reworked dart point identified as a possible Elam type. The other is a very long (30 mm) parallel stem fragment identified as a possible Evant type. The Evant type is largely restricted to the Lampasas Cut Plain (to the east of the WMA) and dates to the Early Archaic period (Turner et al. 2011:98). The Elam type is a north-central Texas type that dates to the Late Archaic period (Turner et al. 2011: 92). Two quartzite groundstone mano fragments were also recovered within the site extension, indicating food processing activities on site.

One shovel test was dug within the site boundaries, roughly 6 m north of Feature 4. Lithic debitage was common on the surface, and a couple of bifaces were in the

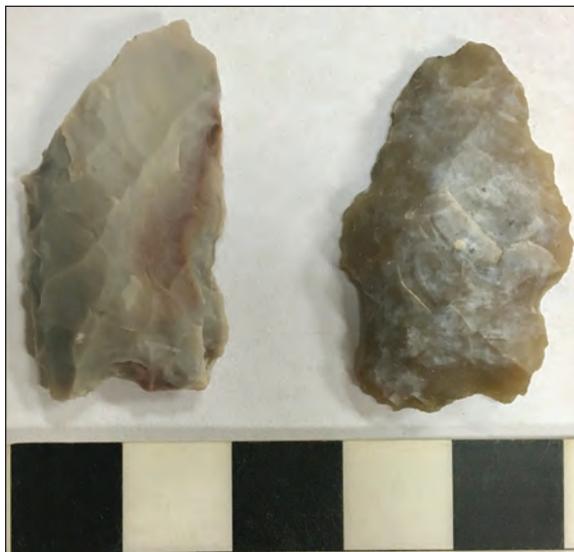


Figure 8. Site BR606 dart points. Probable Evant type left, probable Elam type right.

vicinity. The test was excavated to identify potential for buried deposits on the lower toe/terrace setting. This test (ST 14-1) was positive for cultural materials, recovering 20 flakes from 0 to 20 cmbs mixed with 3% natural gravels, and 3 flakes from 20 to 30 cmbs mixed with roughly 8% natural gravels. One test was excavated to the east and downslope of Feature 4 and was negative for cultural materials. Additional testing was not conducted due to high visibility, the rocky deflated surface, and most of the site lying outside of the brush unit area of impact.

Site 41BR606 is a deflated open campsite scatter with moderate artifact density and diversity that probably includes both Early and Late Archaic occupations. Cultural materials are largely restricted to the rocky, deflated surface or mixed with abundant natural gravels in limited colluvial settings. The site appears to be 20% to 25% intact, having suffered from erosion and probable prior vegetation clearing. The research potential of the site is moderately low, due to the limited potential for significant buried deposits or datable organic material.

Site 41BR606 is not recommended for official designation as a SAL, as it does not meet any of the listed criteria. No further archeological work is recommended. However, avoidance of the portion of the site within proposed Brush Unit 14 is required to protect the limited subsurface deposits.

41BR609

Site 41BR609 was originally recorded as long (30 m northeast-southwest and 110 m northwest-southeast) prehistoric lithic procurement site and possible open campsite located east of two ponds and the eastern ranch road (Lowe 2017). The site boundaries were determined by the density of the surficial artifact scatter.

The artifact assemblage identified at site 41BR609 was largely primary and secondary stage reduction lithic debitage, including some large flakes; the estimated debitage count on site is less than 1,000 pieces. Cultural materials were restricted to the rocky, deflated surface and mixed with abundant natural materials. A small amount of probable limestone FCR is present, with a total of less than 20 pieces mostly less than 5 cm in size. No formal tools were noted. Chipped stone tools include roughly 5 to 10 early-stage reduction bifaces and 20 to 30 informal cores and tested cobbles. The distribution of the artifacts on the landform was consistent with a deflated, dispersed lithic procurement and early stage reduction locale.

The research potential of site 41BR609 was low, due to the absence of temporally diagnostic artifacts and lack of potential for significant buried deposits or datable organic material. The site was not recommended for official designation as a SAL. No further archeological work was recommended, and no avoidance was required.

The extension to site 41BR609 was identified in the south part of Brush Unit 14, when several biface blanks and a light scatter of debitage was noted on the surface on a brushy, sloping area north of the original boundary. The transect survey continued the following day, identifying the edges of the new artifact scatter and flagging additional artifacts.

The site extension added an area roughly 65 m northeast-southwest by 30 m southeast-northwest, extending northeast from the original boundary (Figure 9). No features were identified in the site extension.

One temporally diagnostic projectile point was recovered within the site extension. This is a mostly complete dart point identified as

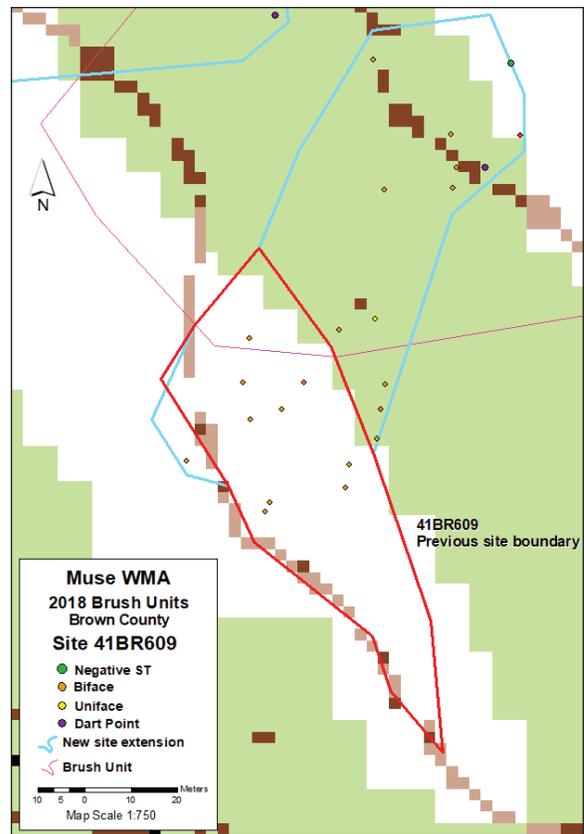


Figure 9. Site 41BR609 map showing extended boundary.

a Pandale type. This type is most commonly found in the Lower Pecos and Trans Pecos regions, extending into southwestern Central Texas, and dates to the Middle Archaic period (Turner et al. 2011: 92). This point is well away from typical distribution area. A thin biface fragment of petrified palm wood was found within a meter, although the erosional setting does not necessarily mean an association between the two artifacts. Beyond these, the overall site assemblage (both visits) includes 20 or more early stage bifaces and biface blanks, 1 uniface, 2 formal cores, 10-20 informal cores/tested cobbles, and 500-8,000 pieces of mainly primary and secondary debitage.

One shovel test was dug within the site boundaries, on the edge of the terrace/toe

at the foot of the slope. No artifacts were noted in this area. The test was excavated to identify potential for buried deposits on the lower toe/terrace setting. This test (ST 14-12) was negative for cultural materials, encountering 15 cm of yellowish brown silty clay loam with 1% natural microgravels overlying calcareous basal clay. Additional testing was not conducted due to high visibility and the rocky deflated surface.

Site 41BR609 is a deflated prehistoric lithic procurement and early-stage reduction scatter with relatively low artifact density marked notably by many early- and mid-stage bifaces (Figure 10). A projectile point on the site dates to the Middle Archaic but it is likely that this site was revisited occasionally over many different eras. The site is near site 41BR606 and they could probably be considered one larger site, with site 41BR609 as a reduction/procurement locale and 41BR606 more of an occupation area.

Cultural materials are restricted to the rocky, deflated surface. The site appears to be 10% intact, having suffered from erosion, probable prior vegetation clearing, and possible artifact collecting. The research potential of the site is low, as sites like this are relatively common in the area, and there is no potential for significant buried deposit or datable organic material.

Site 41BR609 is not recommended for official designation as a SAL, as it does not meet any of the listed criteria. No further archeological work is recommended, and no avoidance is required.

41BR616

Site 41BR616 is a relatively large prehistoric open campsite located in the northwest part of Brush Unit 15. The site is on a broad plain that is near the toe of a west-trending



Figure 10. Select early- and mid-stage bifaces from site 41BR609.

ridge, extending down to Gap Creek. A minor erosional wash bisects the site.

The site is on a grassy drainage divide, with deep-cut tributaries to Gap Creek to the north and south. Gap Creek is roughly 450 m to the west. The surface has rare limestone gravels and small cobbles, as well as some chert gravels. Vegetation is mixed grasses and forbs, juniper and mesquite, and some mature hardwoods. Ground visibility ranges from 20% to 100% and averages 70%. Soils throughout the site were primarily dark brown and brown silty clay loam, from 10 to 30-cm thick, overlying yellowish brown gravelly clay loam that is transitioning to caliche bedrock.

Site 41BR616 was initially discovered when a moderate density artifact scatter was observed on an erosional wash cut along a survey transect (Figure 11). Further inspection of the eroded area identified



Figure 11. Erosional wash cut with artifacts, Site 41BR616. View to southwest.

abundant lithic debitage and some areas of FCR, with several concentrations designated as features. One shovel test (ST 15-3) was excavated on the natural ground level north of a lithic concentration feature. This test encountered 10 cm of dark brown (10YR 3/3) silty clay loam overlying yellowish red clay loam. Two flakes were recovered from the thin upper layer. A decision was made to resume survey. Shovel test 15-5, 30 m south of the wash, was positive for cultural materials (2 flakes in the upper 10 cm layer of dark brown silty clay loam), confirming that the site was not contained within the immediate area of the wash and contained at least a minor buried component that may require extensive delineation.

The site measures 120 m north-south and at least 65 m east-west, with the northern, southern, and eastern boundaries within

the WMA determined through shovel test delineation (Figure 12). The site almost certainly continues west, as the artifact recovery from shovel testing is highest near the western WMA boundary, and the landform continues to the west, getting closer to Gap Creek. The site consists of a moderate density lithic scatter, including buried deposits. Five features were documented, largely along the erosional wash.

Three of the features are artifact concentrations along the edges of the erosional wash. Feature 1 is an artifact concentration on the west end of the erosional wash. It consists of at least 20



Figure 12. Site 41BR616 map.

flakes in a 1 m x 1 m area on the eroded face and floor of the wash. Feature 3 is another area with at least 20 flakes in 1 m x 1 m area on the erosional cut, roughly 10 m further up the cut from Feature 1. Feature 4 also is concentration of at least 20 flakes in a 1 m x 1 m area on the southeast cut.

Feature 2 is a hearth that covers an area 1.4 m north-south and 1.9 m east-west. It extends from the natural surface into the erosional wash, with large burned limestone rocks on the grassy surface and broken smaller limestone on the eroded cut surface (Figure 13). There are also 5-10 flakes in the vicinity, as well as a core on the east edge. It is along the northwest cut, between Features 1 and 3. The profile of the cut adjacent to the surface rocks was cleaned to look for subsurface elements such as additional burned rock, burned earth, and/or charcoal, but none was noted.



Figure 13. Site 41BR616 Feature 2, a deflated hearth. Note FCR on natural surface in rear. View to northwest.

Finally, Feature 5 is an artifact concentration on an eroded surface along the fenceline road, in the northwest part of the site. This is a larger concentration, with at least 50 flakes and a couple of pieces of possible FCR over a 5 m north-south and 2 m east-west (Figure 14).

As noted above, extensive delineation shovel testing was conducted at site 41BR616, due to the presence of buried deposits. There was not a full, 10-m cardinal direction delineation as the main site area had a light surface scatter; however, 10-m cardinal delineation was done on the north, south, and east areas beyond the observed surface scatter to identify the site boundaries. Furthermore, tests were conducted along the western fenceline area as both delineation and to test the density of deposits. In total, 26 shovel tests were excavated in the site area, of which 10 were positive for cultural



Figure 14. Site 41BR616 Feature 5, an artifact scatter. View to east.

materials (STs 15-3, 15-5, 15-6, 15-9 through 15-17, 15-24 through 15-39). Buried deposits extend to as much as 40 cm below surface, although most artifacts were recovered from 0 to 20 cm. Two tests yielded more than 20 flakes each, a third had 10 flakes, six tests recovered 2 flakes, and a final positive test yielded a single flake. No FCR was identified in shovel tests. The tests with the highest recovery were along the west side of the site, suggesting that the site extends to the west, and that the portion recorded within the WMA might be peripheral to a high-density occupation area.

The observed artifact assemblage from site 41BR616 is primarily secondary and larger tertiary stage reduction lithic debitage, totaling 300 to 500 pieces. Roughly 30-40 limestone FCR were noted, mainly in Feature 2, 2 cores, 1 large primary flake. No temporally diagnostic artifacts or formal stone tools were identified at the site, which may indicate previous surface collection.

Site 41BR616 is a relatively large open campsite site with moderate artifact density dating to the broad Prehistoric period. Cultural materials are concentrated on erosional surfaces, and more diffuse on the non-eroded surfaces. Shovel testing indicated that cultural materials are buried across the site at depths of up to 40 cmbs, although most were recovered from 0 to 20 cmbs. The site appears to be 50% to 60% intact, having suffered from erosion, probable prior vegetation clearing, and likely surface collecting. The research potential of the site is moderate due to buried deposits up to 40 cm below surface, albeit in a non-alluvial setting. Furthermore, the presence of one surficial FCR feature suggests at least some potential for more buried, and the possible recovery of datable organic materials.

Site 41BR616 is recommended as unknown for official designation as a SAL. The current round of shovel tests was not enough to determine if the site meets the criteria of containing preserved and intact archeological deposits. Significance testing that possibly includes some geomorphological research is recommended prior to any impacts to the site area, including vegetation clearing and burning. Avoidance of the site area, including a 10 m buffer, is required.

41BR617

Site 41BR617 is a small prehistoric open campsite located in Brush Unit 13. The site setting is a side slope bench, rising to north and west. The surface is covered in limestone gravels and cobbles, as well as some low-quality chert cobbles, with little to no soil present. Vegetation is juniper, sparse grasses and forbs, some succulents. Ground visibility ranges from 50% to 100%, with an average of 70%. Soils throughout the site were thin gravelly loam, consistent with the Brackett-Tarrant association soil type mapped in this area. Lintz's (2010) site #8-8, a lithic procurement locale, is mapped roughly in this area according to the report map. This could indicate this site or perhaps a larger lithic landscape.

Site 41BR617 was identified when an arrow point preform was collected from the surface during transect survey. Additional surface inspection in the vicinity noted several cores, a biface blank, a uniface, and some higher quality chert flakes. No shovel tests were excavated due to the thin, rocky soils and limestone bedrock outcrops in the area.

The site measures 21 m northeast-southwest and 9.5 m northwest-southeast, with the boundaries determined by the extent of the scatter (Figure 15). The site consists of a small, moderate density lithic scatter mixed with natural chert and limestone gravels and cobbles. No FCR or features were noted.

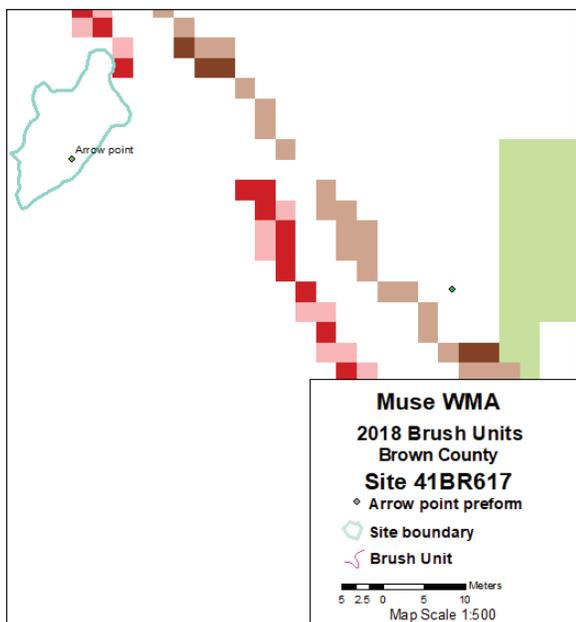


Figure 15. Site 41BR616 map.

The artifact assemblage from site 41BR617 is overwhelmingly lithic debitage, roughly 100 pieces, mainly secondary stage reduction. Broadly temporally diagnostic artifacts include a Late Prehistoric arrow point preform. Chipped stone tools include several cores, one biface blank, one uniface, and one modified flake.

Site 41BR617 is a small, deflated lithic reduction scatter, indicative of primarily mid-stage reduction activity, including flake production for tools and arrow points. The site appears to be less than 10% intact, having suffered from erosion and probable prior vegetation clearing. The research potential of the site is low, as sites like this are relatively common in the area, and there is no potential for significant buried deposit or datable organic material.

Site 41BR617 is not recommended for official designation as a SAL, as it does not meet any of the listed criteria. No further archeological work is recommended, and no avoidance is required.

Isolated Finds

Five isolated finds were documented during this survey. Two of these were isolated chipped stone artifacts: a distal thin biface/possible projectile point fragment (IF 18-2) and a probable blade core (IF 18-5). Both were from Brush Unit 12, but at least 100 m apart. The possible blade core was collected as a unique artifact for possible analysis and to protect from risk of uncontrolled collection.

IF 18-1, in Brush Unit 10, is an odd artifact concentration consisting of a circle of limestone slab field stones and some random historical metal artifacts (Figure 16). The stone circle is roughly 3 m in diameter; two of the central rocks were flipped to check for a possible well or pit, with none noted. A thin, 3.65-cm wide iron hoop, perhaps a barrel loop, is partially beneath one of the rocks. On one edge is a 35.6-cm long nozzle, like on a firehose. Adjacent to this is a 76.2-cm long crankshaft. The only other items were a few sheet metal scraps. Based on the unknown, seeming random nature of the concentration and the limited artifacts, it was documented as an isolated find.



Figure 16. IF 18-1, a limestone slab cluster with historic metal artifacts. View to north.

IF 18-3, in Brush Unit 12, is a possible historic beverage can dump with a possible small fire ring (Figure 17). The cans (six total) are flat-top with church key openings, which was replaced by pop top cans in the mid-1960s. These cans, along with a flattened sanitary can, which likely held food, were scattered across a 3-m long and 2-m wide area. The possible fire ring is a roughly circular arrangement of field stones, but abundant field stones in the area suggest that it could be a natural feature. Due to the redundant nature of the artifact assemblage and the indeterminate nature of the rough stone ring, this was documented as an isolated find.



Figure 17. IF 18-3, a historic beverage can scatter with possible fieldstone fire ring. Note cans on left and right edges and center of photo. View to east.

Finally, IF 18-4, the north part of Brush Unit 12, is a complex of two long, essentially connected, earthen dams. This feature was one of those documented in Lintz (2010). The dams create two ponds, with the smaller to the west, and the larger to the east, adjacent to and visible from the ranch road. The dam for the smaller pond is shaped like a “J” on its side. It is roughly 55-m long, 4-5-m wide, and ranges from 60-90-cm high (Figure 18). This pond was dry at the time of the investigation. The eastern dam is similarly shaped, although the north-south leg is shorter. It is roughly 52-m long, 5-6-m wide, but only 45-cm high. This retention area used natural topography to create a deeper catchment, and the pond may also be slightly dredged or excavated.



Figure 18. IF 18-3, an earthen dam. View to south.

There was some water in this pond during the investigation, as well as wetland vegetation on the edges of the catchment. The dam feature was documented as an isolated find due to the non-diagnostic nature and common occurrence of this feature type.

CONCLUSION

The pedestrian inspection of roughly 64 ac spread over six proposed brush management parcels at the WMA identified two previously unrecorded cultural resource sites, extended the boundaries of two previously recorded sites, and documented five isolated finds. All four of the sites are prehistoric age. Most brush management parcels are situated on level ridgetops and side slope benches near drainages, increasing the potential for prehistoric sites. The survey also found extensive areas of natural chert cobbles mixed with limestone cobbles. Artifacts were occasionally noted among these cobbles, along with many natural fractures. This reflects a lithic landscape reflecting a palimpsest of prehistoric lithic procurement activities, with an artifact density too low to be considered as archeological sites.

No cultural resources were identified in Unit 10. No further work is recommended for this area, nor any conditions on the project.

Isolated finds were identified in Units 11 and 12. These isolated occurrences have no significance. No further work is recommended for these areas, nor any conditions on the project. The function of the earthen dam feature may be enhanced by vegetation clearing associated with this project.

One new archeological site was identified in Unit 13, two previously recorded sites were extended in Unit 14, and one new archeological site was recorded in Unit 15.

These sites, and the recommendations for further work and avoidance, are summarized below.

Site 41BR606 is a deflated open campsite scatter with moderate artifact density and diversity that probably includes both Early and Late Archaic occupations; it is in the northwest part of Brush Unit 14 and extends west beyond the project area. The research potential of the site is moderately low, due to the limited potential for significant buried deposits or datable organic material. Site 41BR606 is not recommended for official designation as a SAL, as it does not meet any of the listed criteria. No further archeological work is recommended. However, avoidance of the portion of the site within proposed Brush Unit 14 is required to protect the limited subsurface deposits, including a 10 m buffer area around the site.

Site 41BR609 is a deflated prehistoric lithic procurement locale and possible open campsite scatter in the south part of Brush Unit 14. The research potential of the site is low. Site 41BR609 is not recommended for official designation as a SAL, as it does not meet any of the listed criteria. No further archeological work is recommended, and no avoidance is required.

Site 41BR616 is a relatively large open campsite site with moderate artifact density dating to the broad Prehistoric period in the northwest part of Brush Unit 15. The research potential of the site is moderate due to buried deposits up to 40 cm below surface, albeit in a non-alluvial setting. Furthermore, the presence of one surficial FCR feature suggests at least some potential for more buried, and the possible recovery of datable organic materials. Site 41BR616 is recommended as unknown for official designation as a SAL. Significance testing that possibly includes some geomorphological

research is recommended prior to any impacts to the site area, including vegetation clearing and burning. Avoidance by the current project is recommended, including a 10 m buffer area around the site.

Site 41BR617 is a small, deflated lithic reduction scatter, indicative of primarily mid-stage reduction activity, including flake production for tools and arrow points; it is located in Brush Unit 13. The research potential of the site is low. It is not recommended for official designation as a SAL, as it does not meet any of the listed criteria. No further archeological work is recommended, and no avoidance is required.

THC concurred that, by following the cultural resource avoidance recommendations above, the brush management and grassland restoration project should have no adverse effect on the cultural resource base at the WMA. TPWD further recommended, and THC concurred, that if any additional cultural features or bones are encountered during the project then work should halt in the immediate area of the possible archeological site and a professional archeologist be called to document the nature of the unanticipated discovery. If the features or bones are determined to be of cultural origin more than 50 years old, then further consultation will be conducted with the SHPO to ensure that the resources have been documented and impacts mitigated.

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INTENSIVE CULTURAL RESOURCES SURVEY OF 2.3 KILOMETERS OF FENCELINE FOR REPLACEMENT, NANNIE M. STRINGFELLOW WILDLIFE MANAGEMENT AREA, BRAZORIA COUNTY

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ABSTRACT

Texas Parks and Wildlife Department plans to replace approximately 2.3 km of existing fenceline from the 1970s or 1980s at the Nannie M. Stringfellow Wildlife Management Area (WMA) in Brazoria County. The existing fenceline no longer serves the requirements of the WMA and is collapsing in some areas. Due to heavy brush growth along much of the fenceline over the past decades, the replacement project will require bulldozing to clear the trees and remove the existing fenceline. This creates a much more significant subsurface impact than hand-clearing of the brush and removal of the fence posts. The project area of potential effects consists of a 10-m wide corridor adjacent to the existing fenceline, with depths of impact anticipated to extend at least 60 cm. An intensive pedestrian survey was conducted on 13-14 November 2018. This included the excavation of 23 shovel tests. No cultural resources were encountered during this survey.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) plans to replace approximately 2.3 km of existing fenceline from the 1970s or 1980s at the Nannie M. Stringfellow Wildlife Management Area (WMA) in Brazoria County (Figure 1). The existing fenceline no longer serves the requirements of the WMA and is collapsing in some areas.

Due to heavy brush growth along much of the fenceline over the past decades, the replacement project will require bulldozing to clear the trees and remove the existing fenceline. This creates a much more significant subsurface impact than hand-clearing of the brush and removal of the fence posts. The project area of potential effects (APE) consists of a 10-m wide corridor adjacent to the existing fenceline, with depths of impact anticipated to extend at least 60 cm.

A cultural resources background review of the project area revealed that no prior archeological surveys have been conducted within the proposed area of potential effects, and no previously recorded archeological sites are present. A review of the soils, geology, and hydrology of the area, determined that much of the project area contained poorly drained shallow clay and was prone to inundation, and has low potential for buried cultural resources despite the alluvial soils. As the WMA is within the area known as "Austin's Woods," part of Stephen F. Austin's original colony in Texas, there is some potential for historic-age cultural resources.

ENVIRONMENTAL BACKGROUND

The swampy bottomlands of one of the last undeveloped coastal scrub forests historically called "Austin's Woods". This area



Figure 1. Nannie M. Stringfellow WMA Location Map.

is located between two arms of Cocklebur Slough, which is east of Cedar Lake Creek and west of San Bernard Creek. Although located more than 16 km from the coast, the elevation is only between 3 to 6 m above sea level. Historically, this area is so poorly drained that no land clearing or settlement has occurred away from County Road 316. The area was not settled, but the swamp was used for free-ranging cattle grazing until less than 20 years ago when the land was acquired as a mitigation bank by Texas Department of Transportation (TxDOT) and given to TPWD to manage.

Elevations across the entire project area are 4.25-4.5 m above mean sea level. The proposed project area is along the northern boundary of the WMA, portions of which are a mowed dirt all-terrain vehicle road. Vegetation consists of a mixture of grasses, dwarf palmetto, yaupon, some briar, and a few large hardwoods.

According to the USGS Texas Geology Map Viewer, the project area is mapped as Quaternary Alluvium (USGS 2018), dating to the Holocene area. These are floodplain deposits, including low terrace deposits 1-2.4 m above the floodplain, composed of clay, silt, sand, and organic matter. Point bars, oxbows, and abandoned channels may be well preserved.

A review of the project area on the Natural Resources Conservation Service (NRCS) Web Soil Survey site shows that 85% of the project area is mapped as Pledger clay, 0-1% slopes, rarely flooded (NRCS 2018). This is a Quaternary aged clayey alluvium derived from igneous, metamorphic, and sedimentary rock, formed in flood plain flats. The representative soil profile shows an A horizon of clay at 0-43 cm overlying a B horizon of clay with slickensides at 43-132 cm, followed by two B layers of silty clay with

slickensides at 132-170 and 170-204 cm. It is described as moderately well drained, rarely flooded and never ponded (NRCS 2018).

The other 15% of the project area is mapped as Asa silty clay loam, 0-1% slopes, rarely flooded (NRCS 2018). This is a Quaternary aged loamy alluvium derived from igneous, metamorphic, and sedimentary rock, formed in flood plain flats. The representative soil profile shows an Ap horizon of silty clay loam at 0-43 cm overlying a Bw (weathered) horizon of silty clay loam at 43-89 cm, a calcareous silty clay loam B horizon at 89-102 cm, and a B'w silt loam horizon at 102-204 cm. It is described as well drained, rarely flooded and never ponded (NRCS 2018).

CULTURAL BACKGROUND

The WMA lies within the Coastal Texas Archeological Region (Perttula 2004:7 Figure 1.1). Human occupation of the region began at least 13,000 years ago. Archeologists generally recognize what are considered to be a series of culture changes, predominately through shifts in the morphology of diagnostic projectile points and other tools and the introduction of, and changes to, substantial features. Alterations in the material culture can be delineated and correlated to climatic changes to contribute to an understanding of human adaptations in the region.

The prehistoric cultural sequence is generally divided into three main periods: Paleoindian, ca. 13,000 to 8,000 BP; Archaic, ca. 8,000 to 1,500 BP; and Ceramic, 1,500 to 300 BP, with subperiods delineated within each major period, reflecting distinctive archeological patterns (Ricklis 2004:184-196). As no cultural materials were identified during this project, no further details are discussed in this report. Interested readers are encouraged to consult the detailed regional summary presented by Ricklis (2004) for further information.

Historically, this part of Texas was utilized by the Karankawa Indians. The region came under the jurisdiction of Spain and Mexico but was not settled. Present Brazoria County was part of the Stephen Austin's impresario land grant obtained from the Spanish government in 1821. Some 298 grants of land were made by Austin. An extant dogtrot structure (41BO77) located about 0.5 km south of the WMA was built by John McCrosky, who was one of Stephen F. Austin's original "Old Three Hundred" settlers. This historic site, listed on the National Register of Historic Places, is associated with the non-extant remains of a log house, sugar mill, cotton gin and cemetery, all of which indicate a thriving settlement close to the WMA (Malone 1973).

Following the War of Independence, the Congress of the Republic of Texas formed Brazoria County on March 17, 1836. The region quickly became prosperous under plantation system in growing sugar cane and cotton. The Levi Jordan Plantation was established in 1848 and is located less than 5 km north of the present WMA. This plantation grew to have 600 ac of improved lands, and produced sugarcane and cotton tended to by some 134 slaves (Kleiner 2018). Despite these early settlements, the WMA contains a remnant of Austin's Woods, which suggests that little local development occurred.

The property was acquired by Robert Stringfellow, who amassed a sizable cattle ranch across much of western Brazoria County. Cattle were raised in the region and newspaper accounts mention cattle drives through the woods to market. In 1923, Robert Stringfellow married Nannie Maddox, who ran a dry goods store in Freeport. The Stringfellows were prominent entrepreneurs and ranchers in Brazoria County. Following Mr. Stringfellow's death in 1941, Nannie Stringfellow took an active

hand in managing the ranch and several businesses until her death in 1971. TPWD took possession of some 3,550 ac in 1999, when it was purchased as a land mitigation bank from TxDOT.

Previous Investigations

A file search with the Texas Archeological Sites Atlas website as well as a review of TPWD maps and reports indicates that one archeological survey has been conducted by professional archeologists on the WMA as well as one monitoring project not indicated on the Atlas map. The previous survey is next to a small portion of the current project area.

In 2008, TPWD Archeologist Chris Lintz conducted a cultural resource monitoring project survey of approximately 155 ac being disked as part of a grassland restoration project east of County Road 316 (Lintz 2009). This area had traditionally been cleared and cultivated, so monitoring was proposed over traditional shovel testing. Eight sites were documented and reported on resulting from the monitoring project, but no site forms were completed, and they have not been submitted for trinomials. These included two oyster shell concentrations that may be of prehistoric origin, an early twentieth century homestead site, a twentieth century industrial site related to a pipeline, a livestock shed complex, a concrete livestock tank, and two windmill complexes. This project area is well away from the current project area.

The survey project consisted of a surface reconnaissance of 5.4 km of raised roadbeds which included at least 12 proposed box culvert replacements or new installations (Lintz 2010). As the roadbed had been built up using dirt from adjoining borrow/drainage ditches, surface inspection was deemed to be the acceptable level of investigation. Swampy conditions in proposed culvert locations hindered any attempt at shovel testing. No

cultural resources were encountered during this project, whose northern terminus coincides with the western edge of the current project area.

METHODS

TPWD Archeologist John D. Lowe conducted an intensive pedestrian survey of the proposed project area. Shovel tests were excavated at roughly 100 m intervals, depending on whether dry ground was available for testing. Following this strategy met the 16 shovel tests per mile standard that Texas Historical Commission (THC) has as a minimum for linear survey projects.

Overall, 23 shovel tests were excavated during the 2.3 km survey (Figure 2). Each test measured 35 cm x 35 cm and was dug in 20-cm levels to a depth of 50 cm, or until encountering the water table or basal clay soils. All sediments were to be screened through ¼" mesh screen or troweled through if not able to be passed through the mesh. Each shovel test was recorded on a log, noting the presence/absence of cultural materials, Munsell soil color, soil texture, and inclusions for each soil strata encountered. When cultural materials were encountered, the depth of the recovery, a count, and a simple description was noted on the form. Each shovel test location was recorded using a Trimble GeoXT GPS unit. All shovel tests were backfilled following recording.

Artifacts to be collected included temporally diagnostic artifacts identified on the surface, unusual artifacts at risk of uncontrolled collection, and all artifacts recovered from shovel testing. These artifacts would be curated at the TPWD Archeology Laboratory curatorial facility; however, no artifacts were collected. Notes will be kept at the TPWD Wildlife Division files.



Figure 2. Aerial imagery showing project area and shovel test locations.

As stated above, the THC guidelines stipulate that for linear project areas within a less than 30-m wide corridor, 16 shovel tests should be placed for every mile. For this project, 23 shovel tests were required, and the 23 shovel tests excavated during the current project met this standard.

RESULTS

The survey was conducted November 13 and 14, 2018. The weather was unseasonably cold, with highs in the low 40s and a freeze the night of the 13th. While the weather was dry, heavy rains during September and October combined with the poor drainage in the region led to much of the project area being covered with between 10-30 cm of standing water (Figure 3). According to WMA staff, this area is inundated yearly for several months.

The project area largely followed a cleared, mowed fenceline/hunting road (see Figure 3). Vegetation consisted of mixed grasses, briars, dwarf palmetto, poison ivy, yaupon, and some larger hardwoods (Figure 4). Ground visibility was low, ranging from 0% to 20% due to the water and grasses.

This area is largely swampy bottomlands with no drainages; the nearest drainage is Cocklebur Slough located 500 m northeast at its closest point. For this reason, this section was considered to have low potential for cultural resources, despite the alluvial soils. The location in swampy bottomlands indicates limited potential for historic-aged structures, as most buildings are on the higher elevation areas less susceptible to inundation.



Figure 3. Typical cleared ROW overview, with standing water. View to southeast.



Figure 4. Mature hardwood, palmetto, and brushy understory on higher dry ground. View to southwest.

The well-used dirt road has undergone significant compaction from vehicle tires as well as some probable erosion (Figure 5). The areas with larger hardwoods, as well as less impacted areas on the adjacent private property, show that much of the ROW is as much as 30 cm lower than higher surrounding areas.

Twenty-three shovel tests were excavated during the survey. These were placed generally at 100 m intervals, with some slightly further due to lack of dry areas for testing. The saturated soils across the project area made for difficult digging and screening of the thick clayey soils. In the southeastern parts of the survey area, many tests were dug in areas of shallow standing water. Soils across the area were an upper level of very dark gray (10YR 3/1) or very dark



Figure 5. Sample road compaction within ROW. Note higher ground on left edge of ROW and substantial tire rutting. View to southeast.

brown (10YR 2/2) silty clay loam, 10 to 20 cm thick, overlying sticky, wet, black (10YR 2/1) silty clay (Figure 6). This lower level was impenetrably thick and sticky beyond 30 cm.

No cultural resources were encountered during the survey.

CONCLUSION

TPWD plans to replace approximately 2.3 km of existing fenceline at the Nannie M. Stringfellow WMA in Brazoria County, Texas. The existing fenceline no longer serves the requirements of the WMA and is collapsing in some areas. The project area of potential effects consists of a 10-m wide corridor adjacent to the existing fenceline, with depths of impact anticipated to extend at least 60 cm.

During the intensive pedestrian survey, 23 shovel tests were excavated. Tests were placed at roughly 100 m intervals, focusing on dry spots along the very edge of the fenceline or by larger trees. All tests were negative, encountering the water table and wet impassably thick and sticky clay by 30 cm. Almost all the project area was under water ranging from 10-30 cm in depth.

No cultural resources were encountered during the fenceline survey.

TPWD recommended, and THC concurred, that replacement of the fenceline within the project area should have no adverse effect on the cultural resource base at the WMA. TPWD also recommended, and THC concurred, that if any cultural materials are



Figure 6. Typical soil profile showing very dark gray silty clay loam over black silty clay, as well as water table. View to southwest.

encountered during the project then work should halt in the immediate area of the possible archeological site and a professional archeologist be called to document the nature of the unanticipated discovery. If the materials are determined to be of cultural origin more than 50 years old, then further consultation will be conducted with the SHPO to ensure that the resources have been documented and impacts mitigated.

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CULTURAL RESOURCES SURVEY OF 0.8 ACRES FOR A PROPOSED BUNKHOUSE REPLACEMENT PROJECT AT ROGER R. FAWCETT WILDLIFE MANAGEMENT AREA, PALO PINTO COUNTY

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ABSTRACT

Texas Parks and Wildlife Department plans to construct a new bunkhouse building and associated underground utilities on the Roger R. Fawcett Wildlife Management Area. A pedestrian survey was conducted on 08 July 2017, and no shovel tests were excavated. No cultural resources were encountered during this survey. This project was initially cleared internally under the auspices of the Memorandum of Understanding between Texas Parks and Wildlife Department and the Texas Historical Commission. In August 2018, it was determined that the construction projects would be partially funded using federal funds, necessitating a full Section 106 review, including consultation with the THC. A determination of no effects to historic properties was made on 13 September 2018.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) plans to use state and federal funds to construct a new bunkhouse building for the Roger R. Fawcett Wildlife Management Area (WMA). The current bunkhouse and trailer are aging and inadequate as housing for planned activities at the WMA.

The WMA consists of roughly 5,400 ac of the former XO Ranch lands in Palo Pinto County, Texas (Figure 1), acquired by the Texas Parks and Wildlife Foundation in 2015 and turned over to TPWD. This land is one of the best remaining examples of Cross Timbers habitat left in the state. The current project area is in the west-central part of the WMA and includes areas that have been previously developed (Figure 2).

The new bunkhouse project involves demolition of the current bunkhouse and a nearby trailer that serves as an auxiliary

bunkhouse, followed by construction of a new building with associated utilities within a roughly 0.8 ac area (see Figure 2). Primary impacts will include demolition/removal of the structures, possible clearing and grading for the foundation, and installation of buried utilities including water, a septic system, and possibly phone. Other impacts may include clearing of select trees and construction of a new paved or gravel driveway and parking lot. Anticipated depth of disturbance will be less than 15 cm for the foundation, a maximum of 1 m for any buried utilities, and as much as 2.4 m for a septic tank.

A background review indicated that the area has not been previously surveyed, and no previously recorded archeological sites are present. Project area soils consist almost entirely of thin sandy soils over clay or bedrock and include areas of sandstone bedrock outcrops.

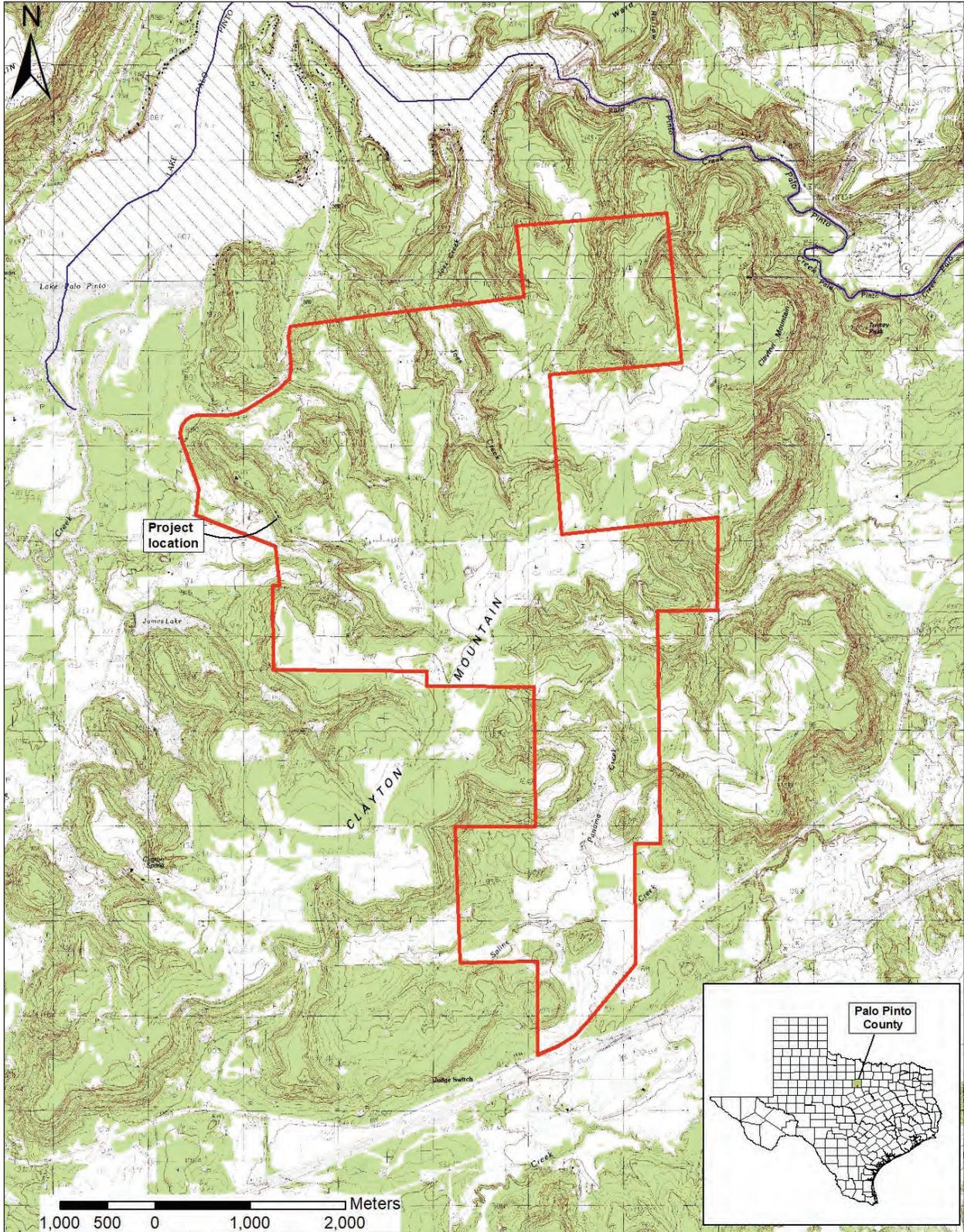


Figure 1. Topographic map showing project area.

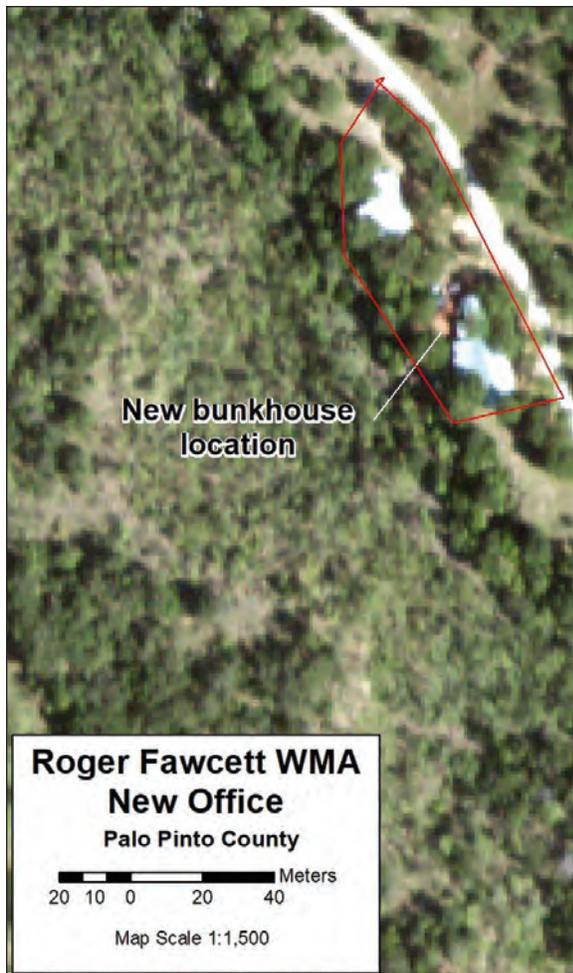


Figure 2. Aerial imagery showing bunkhouse project area.

This project was originally cleared internally on 28 July 2017 under the Memorandum of Understanding between TPWD and the Texas Historical Commission (THC; as outlined in the Texas Administrative Code Title 13, Cultural Resource, Part II. Texas Historical Commission (THC), Chapter 26 Practices and Procedures). Specifically, §26.27(c)(2)(A) (i) states that construction or maintenance projects on TPWD lands that result in impact to the ground surface or subsurface will be reviewed by the THC prior to project inception only when the project impacts a total or cumulative area of 10 ac or more.

In August 2018, it was determined that the Fawcett WMA construction projects would be partially funded using federal funds, necessitating a full Section 106 review, including consultation with the THC. This explains the extended delay between the initial survey and the submission of the interim report.

ENVIRONMENTAL BACKGROUND

The geology of the project area, as well as most of the Fawcett WMA, is mapped as the Brazos River Formation Expanded of the Pennsylvanian period Des Moines Series (U.S. Geological Survey [USGS] 2016), which formed roughly 300 million years ago. In southern Palo Pinto County, this formation consists of sandstone, conglomerate, and mudstone, fine to medium grained, calcareous with some marine megafossils, and grading into thin beds of sandstone and shale (USGS 2016). This is not a chert-bearing formation.

The project area soils are mapped within the Bonti-Exray complex, 1-8% slopes, extremely stony. This association is formed on the summit and shoulders of ridgetops from loamy and/or clayey residuum weathered from claystone and/or sandstone; surface gravels range from 10% to 14%. The typical profile consists of about 10 cm of fine to very fine sandy loam, a second layer of fine sandy loam 10 cm, clay from 20 cm to between 40 and 80 cm depending on summit versus shoulder, overlying bedrock (Natural Resources Conservation Service 2016).

Based on a review of the soils and geology, the project area has a low probability for prehistoric cultural resources, and a very low probability for buried cultural resources. The presence of ranch structures within the project area suggests a moderate potential

for historic-aged cultural resources, although most, if not all, of the construction in the bunkhouse area is within the last 30 years or so.

CULTURAL BACKGROUND

The WMA lies within the North-Central Texas Archeological Region (Perttula 2004:7 Figure 1.1). Human occupation of the north-central Texas Hill Country began at least 11,000 years ago, with recent evidence suggesting that it may have started a couple of thousand years earlier. Archeologists generally recognize what are considered to be a series of culture changes, predominately through shifts in the morphology of diagnostic projectile points and other tools and the introduction of, and changes to, substantial features. Alterations in the material culture can be delineated and correlated to climatic changes to contribute to an understanding of human adaptations in the region.

The prehistoric cultural sequence is generally divided into three main periods: Paleoindian, ca. 9250 to 6850 B.C.; Archaic, ca. 6850 B.C. to A.D. 700; and Late Prehistoric, A.D. 700 to 1650, with subperiods delineated within each major period, reflecting distinctive archeological patterns (Collins 2004:112-113, 116-123). As no cultural materials were identified during this project, no further details are discussed in this report. Interested readers are encouraged to consult the detailed regional summary presented by Collins (2004) for further information.

Previous Investigations

The Texas Sites Atlas database and records maintained by TPWD indicate that no previous archeological survey has been conducted within any part of the WMA, and there are no previously recorded archeological sites within the WMA.

The nearest archeological site to the proposed project area is roughly 5 km west. This site, 41PP309, is a small surficial lithic scatter on a rise in the Palo Pinto Creek floodplain. It was recorded, along with several other sites, during a 1984 intensive pedestrian survey by Espey, Huston, and Associates (subsequently PBSJ Corporation and now Atkins) for an overhead powerline for the Brazos Electric Power Cooperative.

Fourteen archeological sites were recorded along Palo Pinto Creek, east-northeast of the WMA boundaries, as part of a 2010 survey by Geo-Marine, for the proposed Turkey Peak Reservoir project. Several of these are prehistoric sites with buried components and were recommended for significance testing excavations.

METHODS

TPWD Archeologist John D. Lowe conducted a pedestrian reconnaissance survey of the 0.8 ac new bunkhouse building project area on 08 July 2017.

Lowe walked the entirety of the project area, examining the surface both for cultural materials and potential for deposits. Ultimately, no shovel tests were excavated based on the shallow soils, observed sandstone bedrock outcroppings, previous construction disturbances, and shovel test results in the vicinity.

The THC minimum survey standards for a project area of less than two acres calls for three shovel tests for every acre, or three shovel tests. The current investigations fell short of this standard. However, the THC survey standards also state that shovel tests are excavated in settings with potential for buried cultural materials. The investigator determined that the setting was not conducive for buried materials.

All sites, isolated finds, and features were documented using photographs, field notes, and a GPS point. Due to the limited amount of previous work in the area, a low threshold for distinguishing a site from an isolated find was in use for this project. A density of one artifact per square meter, with a minimum of six artifacts, was selected as the requirement for determining a site. The presence of burned rock, chipped stone tools or a variety of artifact types could also be a determining factor. Non-diagnostic isolated historic artifacts and prehistoric lithic debitage, following an examination of the ground surface in the vicinity, were noted but not documented. Temporally diagnostic artifacts, artifacts believed to be at risk of uncontrolled collection, and artifacts recovered from shovel tests were collected and curated in the TPWD Archeology Lab curatorial facility. No artifacts were encountered or collected during this project.

RESULTS

The early summer weather was hot and sunny. Access was easily available via the main ranch road, which runs adjacent to the southern portion of the project area.

The survey area is an existing residential complex that includes a main bunkhouse, a stone porch, a water tank, an outdoor fireplace and grill, a large smoker (Figure 3), and a separate trailer (Figure 4). The porch includes brick and probable locally sourced field stone, while the fireplace and smoker are likely locally sourced fieldstone (Figure 5). The bunkhouse consists of an original smaller structure and at least two modern (post-1970) additions. The current project report is strictly related to archeology; a separate assessment of the bunkhouse will need to be done by an architectural historian, although it is likely that all the modern additions and renovations have adversely impacted any significance of the original structure.



Figure 3. Overview of main bunkhouse (note original structure in rear with modern addition in foreground), stone/brick porch, water tank, outdoor fireplace, and large grill/smoker. View to southeast.



Figure 4. Overview of modern trailer in bunkhouse complex. View to south.

Sandstone bedrock outcrops were present across the project area, indicating shallow soils consistent with the geological and soils maps. Surface visibility was high in the grassy areas around the structures, averaging about 60%.

Disturbances within the project area were related to the construction and maintenance of the bunkhouse, trailer, water tank,



Figure 5. Detail of field stone fireplace and grill. View to northwest.

porch, and associated utilities. The extent of potential subsurface utilities is unknown; power is from an overhead line, water is currently drawn from the outdoor tank and sourced from a rain/runoff catchment, and phone is from a buried line. There are no paved driveways or parking areas, but there are drives and parking areas eroded down to natural gravels.

A formal surface reconnaissance of the project area was conducted to identify materials and assess the potential for buried deposits. No cultural resources were noted on the surface within the project area, and the potential for buried deposits was extremely low. Two shovel tests excavated along the southern edge of the project area as part of an access road survey conducted concurrently (Lowe 2017) encountered 10

to 15 cm of brown sandy loam overlying sandstone bedrock.

No cultural resources were encountered during the survey.

CONCLUSION

The new bunkhouse project involves construction of a new building with associated utilities within a roughly 0.8 ac area where the existing bunkhouse complex is located. Primary impacts will include demolition of the existing structures, possible removal of foundations, and installation of buried utilities including water, a septic system, and possibly phone. Other impacts may include clearing of select trees and construction of a paved or gravel driveway and parking lot. Anticipated depth of disturbance will be less than 15 cm for the foundation, a maximum of 1 m for any buried utilities, and as much as 2.4 m for a septic tank. The work will be conducted by an experienced contractor.

The file searches and pedestrian reconnaissance of the 0.8 ac project area found that it consists of relatively shallow soils with minimal potential for cultural resources. No shovel tests were excavated due to the existing structures, shallow soils and results of a survey adjacent to the project area. No cultural resources were encountered within the project area.

TPWD recommended, and THC concurred, that construction of the new building with associated utilities, driveway, and parking lot should have no adverse effect on the archeological cultural resource base at the WMA. TPWD also recommended, and THC concurred, that if any cultural materials are encountered during the project then work should halt in the immediate area of the possible archeological site and a professional archeologist be called to document the nature of the unanticipated discovery. If the

materials are determined to be of cultural origin more than 50 years old, then further consultation will be conducted with the THC to ensure that the resources have been documented and impacts mitigated.

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CULTURAL RESOURCES SURVEY OF 0.5 ACRES FOR A PROPOSED NEW OFFICE BUILDING AT ROGER R. FAWCETT WILDLIFE MANAGEMENT AREA, PALO PINTO COUNTY

JOHN D. LOWE

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ABSTRACT

Texas Parks and Wildlife Department plans to use state and federal funds to construct a new office building for the Roger R. Fawcett (Fawcett) Wildlife Management Area. The existing structures at the recently acquired WMA are not suitable for a permanent office facility. The new office project involves construction of a new building with associated utilities within a roughly 0.5 ac area, just west of the existing shop building. The actual area surveyed for the project is roughly 1.5 ac in size, to allow for flexibility in final project design. A pedestrian survey was conducted on 07 July 2017. No shovel tests were excavated. No cultural resources were encountered during this survey. This project was initially cleared internally under the auspices of the Memorandum of Understanding between Texas Parks and Wildlife Department and the Texas Historical Commission. In August 2018, it was determined that the WMA construction projects would be funded partially using federal funds, necessitating a full Section 106 review, including consultation with the Texas Historical Commission.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) plans to use state and federal funds to construct a new office building for the Roger R. Fawcett Wildlife Management Area (WMA). The existing structures at the recently acquired WMA are not suitable for a permanent office facility.

Fawcett WMA consists of roughly 5,400 ac of the former XO Ranch lands in Palo Pinto County, Texas (Figure 1), acquired by the Texas Parks and Wildlife Foundation in 2015 and turned over to TPWD. This land is one of the better remaining examples of Cross Timbers habitat left in the state. The current project area is in the west part of the WMA in an undeveloped area (Figure 2).

The new office project involves construction of a new building with associated utilities within a roughly 0.5 ac area, just west of the existing shop building. Primary impacts will include clearing and grading for the foundation, installation of buried utilities including water and possibly phone, and construction of a paved or gravel driveway and parking lot. Anticipated depth of disturbance will be less than 15 cm for the foundation, and a maximum of 1 m for any buried utilities. Work will be conducted by an experienced contractor. The actual area surveyed for the project is roughly 1.5 ac in size, to allow for flexibility in final project design.

A background review indicated that the area has not been previously surveyed, and no previously recorded archeological

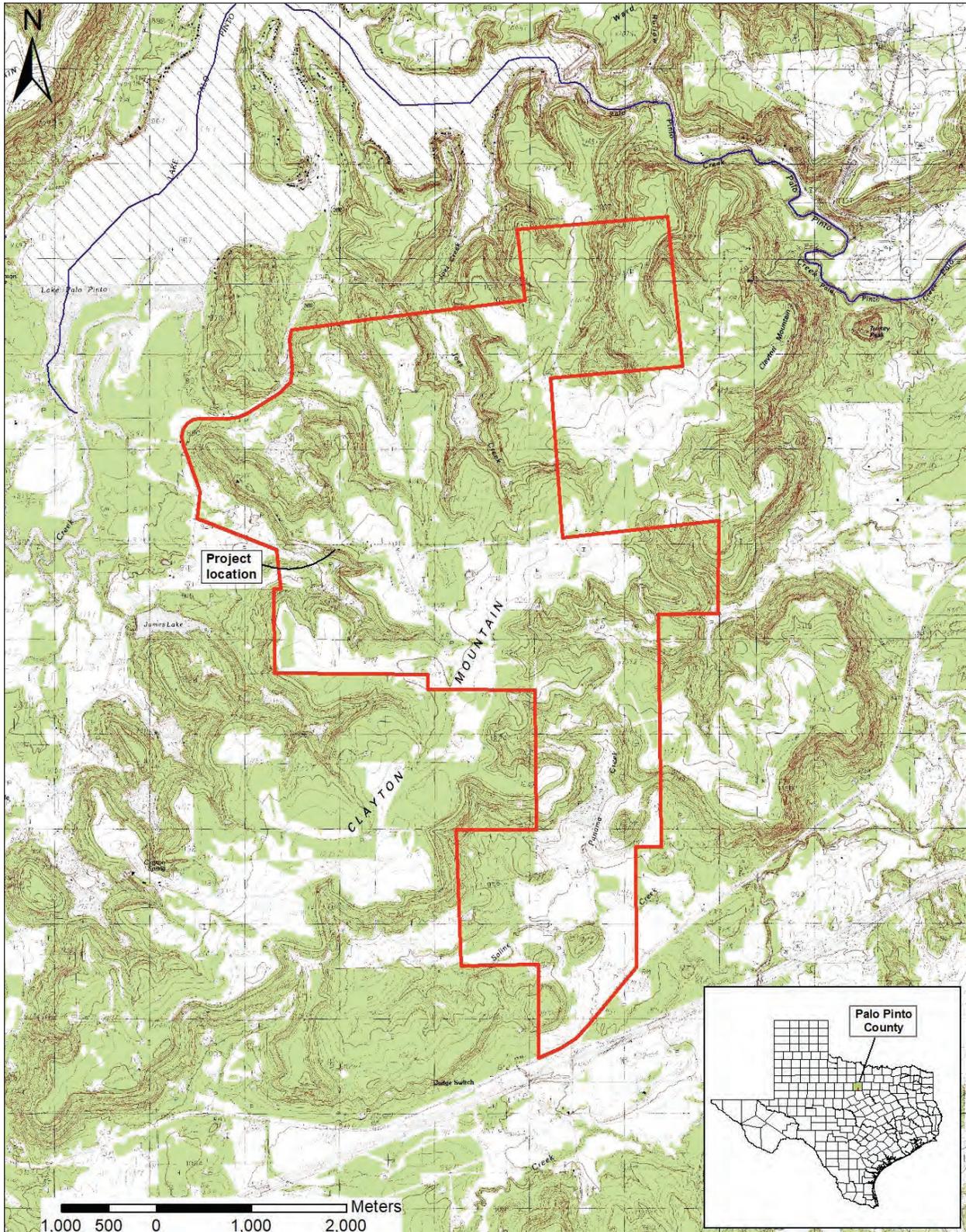


Figure 1. Topographic map showing project area.

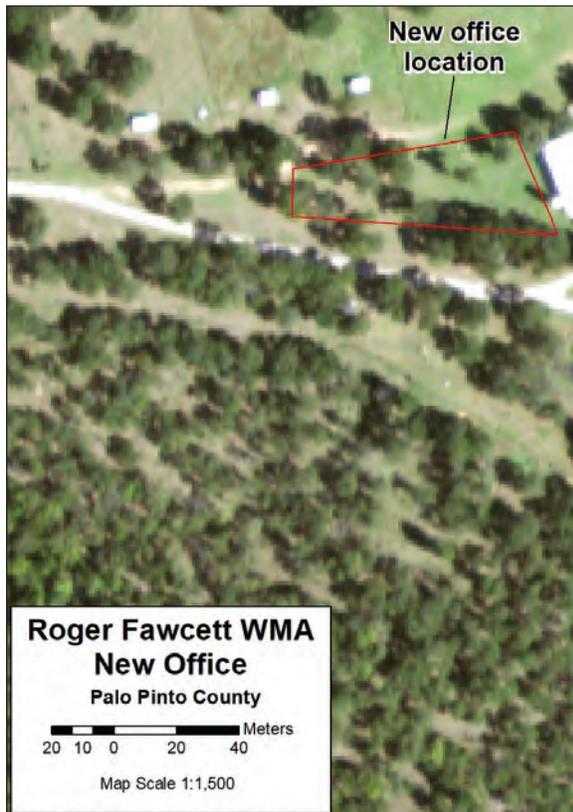


Figure 2. Aerial imagery showing office project area.

sites are present. Project area soils consist almost entirely of thin sandy soils over clay or bedrock and include areas of sandstone bedrock outcrops.

This project was originally cleared internally on 28 July 2017 under the Memorandum of Understanding between TPWD and the Texas Historical Commission (THC; as outlined in the Texas Administrative Code Title 13, Cultural Resource, Part II. Texas Historical Commission (THC), Chapter 26 Practices and Procedures). Specifically, §26.27(c)(2)(A) (i) states that construction or maintenance projects on TPWD lands that result in impact to the ground surface or subsurface will be reviewed by the THC prior to project inception only when the project impacts a total or cumulative area of 10 ac or more.

In August 2018, it was determined that the Fawcett WMA construction projects would be partially funded using federal funds, necessitating a full Section 106 review, including consultation with the THC. This explains the extended delay between the initial survey and the submission of the interim report.

ENVIRONMENTAL BACKGROUND

The geology of the project area, as well as most of the Fawcett WMA, is mapped as the Brazos River Formation Expanded of the Pennsylvanian period Des Moines Series (US Geological Survey [USGS] 2016), which formed roughly 300 million years ago. In southern Palo Pinto County, this formation consists of sandstone, conglomerate, and mudstone, fine to medium grained, calcareous with some marine megafossils, and grading into thin beds of sandstone and shale (USGS 2016). This is not a chert-bearing formation.

The project area soils are mapped within the Bonti-Exray complex, 1-8% slopes, extremely stony. This association is formed on the summit and shoulders of ridgetops from loamy and/or clayey residuum weathered from claystone and/or sandstone; surface gravels range from 10% to 14%. The typical profile consists of about 10 cm of fine to very fine sandy loam, a second layer of fine sandy loam 10 cm, clay from 20 cm to between 40 and 80 cm depending on summit versus shoulder, overlying bedrock (Natural Resources Conservation Service 2016).

Based on a review of the soils and geology, the project area has a low probability for prehistoric cultural resources, and a very low probability for buried cultural resources. The presence of ranch structures within the project area suggests a moderate potential for historic-aged cultural resources.

CULTURAL BACKGROUND

The WMA lies within the North-Central Texas Archeological Region (Perttula 2004:7 Figure 1.1). Human occupation of the north-central Texas Hill Country began at least 11,000 years ago, with recent evidence suggesting that it may have started a couple of thousand years earlier. Archeologists generally recognize what are considered to be a series of culture changes, predominately through shifts in the morphology of diagnostic projectile points and other tools and the introduction of, and changes to, substantial features. Alterations in the material culture can be delineated and correlated to climatic changes to contribute to an understanding of human adaptations in the region.

The prehistoric cultural sequence is generally divided into three main periods: Paleoindian, ca. 9250 to 6850 B.C.; Archaic, ca. 6850 B.C. to A.D. 700; and Late Prehistoric, A.D. 700 to 1650, with subperiods delineated within each major period, reflecting distinctive archeological patterns (Collins 2004:112-113, 116-123). As no cultural materials were identified during this project, no further details are discussed in this report. Interested readers are encouraged to consult the detailed regional summary presented by Collins (2004) for further information.

Previous Investigations

The Texas Sites Atlas database and records maintained by TPWD indicate that no previous archeological survey has been conducted within any part of the WMA, and there are no previously recorded archeological sites within the WMA.

The nearest archeological site to the proposed office project area is roughly 5 km west. This site, 41PP309, is a small surficial lithic scatter on a rise in the Palo Pinto Creek floodplain. It was recorded, along with

several other sites, during a 1984 intensive pedestrian survey by Espey, Huston, and Associates (subsequently PBSJ Corporation and now Atkins) for an overhead powerline for the Brazos Electric Power Cooperative.

A number of archeological sites were recorded along Palo Pinto Creek, east-northeast of the WMA boundaries, as part of a 2010 survey by Geo-Marine, for the proposed Turkey Peak Reservoir project. Several of these are prehistoric sites with buried components and were recommended for significance testing excavations.

METHODS

TPWD Archeologist John D. Lowe conducted a pedestrian reconnaissance survey of the 0.5 ac new office building project area on 07 July 2017.

Lowe walked the entirety of the project area, examining the surface both for cultural materials and potential for deposits. Ultimately, no shovel tests were excavated based on the shallow soils, observed sandstone bedrock outcroppings, and shovel test results in the vicinity.

The THC minimum survey standards for a project area of less than two acres calls for three shovel tests for every acre, or two shovel tests. The current investigations fell short of this standard. However, the THC survey standards also state that shovel tests are excavated in settings with potential for buried cultural materials. The investigator determined that the setting was not conducive for buried materials.

All sites, isolated finds, and features were documented using photographs, field notes, and a GPS point. Due to the limited amount of previous work in the area, a low threshold for distinguishing a site from an isolated find was in use for this project. A density of one

artifact per square meter, with a minimum of six artifacts, was selected as the requirement for determining a site. The presence of burned rock, chipped stone tools or a variety of artifact types could also be a determining factor. Non-diagnostic isolated historic artifacts and prehistoric lithic debitage, following an examination of the ground surface in the vicinity, were noted but not documented. Temporally diagnostic artifacts, artifacts believed to be at risk of uncontrolled collection, and artifacts recovered from shovel tests were collected and curated in the TPWD Archeology Lab curatorial facility. No artifacts were encountered or collected during this project.

RESULTS

The early summer weather was hot and sunny. Access was easily available via the main ranch road, which runs adjacent to the southern portion of the project area.

The survey area is a manicured, maintained lawn with trees primarily located along the edges of the road loop to the north and south (Figure 3). Sandstone bedrock outcrops were present across the project area (Figure 4), indicating shallow soils consistent with the



Figure 3. Overview of project area. View to east.



Figure 4. Detail of representative bedrock outcrops in project area. View to northwest.

geological and soils maps. Surface visibility was high, averaging 60%.

Disturbances within the project area were limited and primarily related to the construction and maintenance of the gravel ranch road and graded dirt loop road. There was no evidence of plowing in the survey area.

A formal surface reconnaissance of the project area was conducted to identify materials and assess the potential for buried deposits. No cultural resources were noted on the surface within the project area, and the potential for buried deposits was determined to be extremely low. Two shovel tests excavated along the southern edge of the project area as part of an access road survey conducted concurrently (Lowe 2017) encountered brown sandy loam to 15 cm below surface overlying sandstone bedrock.

No cultural resources were encountered during the survey.

CONCLUSION

The new office project involves construction of a new building with associated utilities within a roughly 0.5 ac area west of the existing barn/shop building. Primary impacts will include clearing and grading for the foundation, and installation of buried utilities including water and possibly phone. Other impacts may include clearing of select trees and construction of a paved or gravel driveway and parking lot. Anticipated depth of disturbance will be less than 15 cm for the foundation, and a maximum of 1 m for any buried utilities. The work will be conducted by an experienced contractor.

The file searches and pedestrian survey of the 0.5 ac project area found that it consists of relatively shallow, in situ soils with minimal potential for cultural resources. As the project includes federal funding, an intensive pedestrian survey was required in accordance with Section 106 of the National Historic Preservation Act.

No shovel tests were excavated during the survey. Two shovel tests excavated along the southern edge of the project area as part of an access road survey conducted concurrently (Lowe 2017) encountered brown sandy loam to 15 cm below surface overlying sandstone bedrock.

TPWD recommended, and THC concurred, that construction of the new office building with associated utilities, driveway, and parking lot should have no adverse effect on the cultural resource base at the WMA. TPWD also recommended, and THC concurred, that if any cultural materials are encountered during the project then work should halt in the immediate area of the possible archeological site and a professional archeologist be called to document the nature of the unanticipated discovery. If the

materials are determined to be of cultural origin more than 50 years old, then further consultation will be conducted with the THC to ensure that the resources have been documented and impacts mitigated.

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CULTURAL RESOURCES SURVEY OF 1.5 ACRES FOR A PROPOSED NEW OFFICE BUILDING AT ROGER R. FAWCETT WILDLIFE MANAGEMENT AREA, PALO PINTO COUNTY

JOHN D. LOWE

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ABSTRACT

Texas Parks and Wildlife Department plans to use state and federal funds to construct a new office building for the Roger R. Fawcett Wildlife Management Area. The existing structures at the recently acquired property are not suitable for a permanent office facility. The new office project involves construction of a new building with associated utilities within a roughly 0.5 ac area, 480 m west of the existing shop building. Primary impacts will include clearing and grading for the foundation, installation of buried utilities including water and possibly phone, and construction of a paved or gravel driveway and parking lot. Anticipated depth of disturbance will be less than 15 cm for the foundation, and a maximum of 1 m for any buried utilities. Work will be conducted by an experienced contractor. The actual area surveyed for the project is roughly 1.5 ac in size, to allow for flexibility in final project design. An intensive pedestrian survey was conducted on September 24, 2018. This included the excavation of three shovel tests. No cultural resources were encountered during this survey.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) plans to use state and federal funds to construct a new office building for the Roger R. Fawcett Wildlife Management Area (WMA). The existing structures at the recently acquired WMA are not suitable for a permanent office facility. As the project includes federal funding, an intensive pedestrian survey was required in accordance with Section 106 of the National Historic Preservation Act.

The WMA consists of roughly 5,400 ac of the former XO Ranch lands in Palo Pinto County, Texas (Figure 1), acquired by the Texas Parks and Wildlife Foundation in 2015 and turned over to TPWD. This land is one of the better remaining examples of Cross Timbers habitat

left in the state. The current project area is in the west part of the WMA in an undeveloped area (Figure 2).

The new office project involves construction of a new building with associated utilities within a roughly 0.5 ac area, 480 m west of the existing shop building. Primary impacts will include clearing and grading for the foundation, installation of buried utilities including water and possibly phone, and construction of a paved or gravel driveway and parking lot. Anticipated depth of disturbance will be less than 15 cm for the foundation, and a maximum of 1 m for any buried utilities. Work will be conducted by an experienced contractor. The actual area surveyed for the project is roughly 1.5 ac in size, to allow for flexibility in final project design.

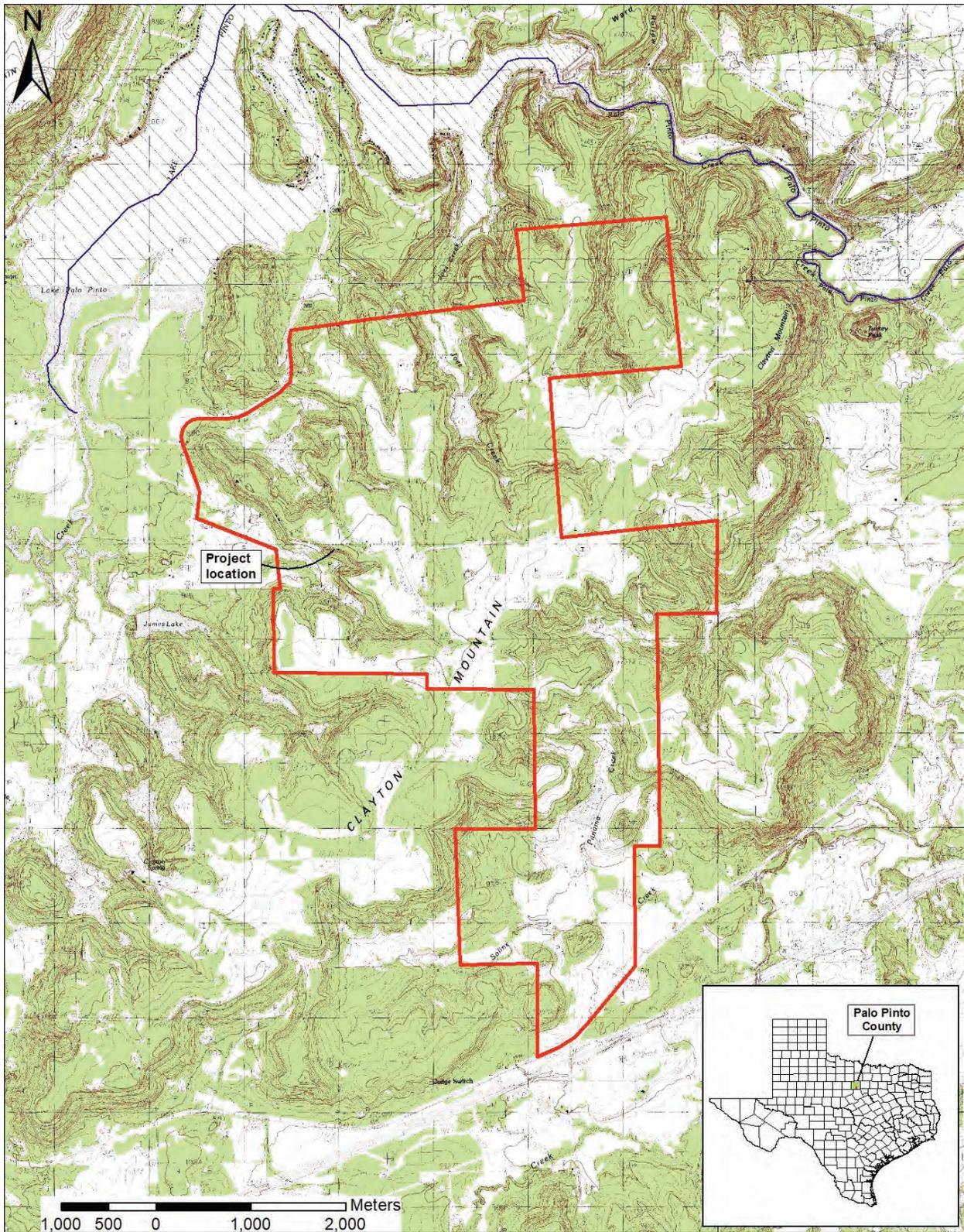


Figure 1. Topographic map showing project area.



Figure 2. Aerial imagery showing office project area.

A background review indicated that the area has not been previously surveyed, and no previously recorded archeological sites are present. Project area soils consist almost entirely of thin sandy soils over clay or bedrock and include areas of sandstone bedrock outcrops.

ENVIRONMENTAL BACKGROUND

The geology of the project area, as well as most of the WMA, is mapped as the Brazos River Formation Expanded of the Pennsylvanian period Des Moines Series (US Geological Survey [USGS] 2016), which formed roughly 300 million years ago. In southern Palo Pinto County, this formation consists of sandstone, conglomerate, and mudstone, fine to medium grained,

calcareous with some marine megafossils, and grading into thin beds of sandstone and shale (USGS 2016). This is not a chert-bearing formation.

The project area soils are mapped within the Bonti-Exray complex, 1-8% slopes, extremely stony. This association is formed on the summit and shoulders of ridgetops from loamy and/or clayey residuum weathered from claystone and/or sandstone; surface gravels range from 10% to 14%. The typical profile consists of about 10 cm of fine to very fine sandy loam, a second layer of fine sandy loam about 10 cm, clay from 20 cm to between 40 and 80 cm depending on summit versus shoulder, overlying bedrock (Natural Resources Conservation Service 2016).

Based on a review of the soils and geology, the project area has a low probability for prehistoric cultural resources, and a very low probability for buried cultural resources. The presence of ranch structures within the project area suggests a moderate potential for historic-aged cultural resources.

CULTURAL BACKGROUND

The WMA lies within the North-Central Texas Archeological Region (Perttula 2004:7 Figure 1.1). Human occupation of the north-central Texas Hill Country began at least 11,000 years ago, with recent evidence suggesting that it may have started a couple of thousand years earlier. Archeologists generally recognize what are considered to be a series of culture changes, predominately through shifts in the morphology of diagnostic projectile points and other tools and the introduction of, and changes to, substantial features. Alterations in the material culture can be delineated and correlated to climatic changes to contribute to an understanding of human adaptations in the region.

The prehistoric cultural sequence is generally divided into three main periods: Paleoindian, ca. 9250 to 6850 B.C.; Archaic, ca. 6850 B.C. to A.D. 700; and Late Prehistoric, A.D. 700 to 1650, with subperiods delineated within each major period, reflecting distinctive archeological patterns (Collins 2004:112-113, 116-123). As no cultural materials were identified during this project, no further details are discussed in this report. Interested readers are encouraged to consult the detailed regional summary presented by Collins (2004) for further information.

Previous Investigations

The Texas Sites Atlas database and records maintained by TPWD indicate that no previous archeological survey has been conducted within any part of the WMA, and there are no previously recorded archeological sites within the WMA.

All three surveys were conducted in 2017 by TPWD Archeologist John D. Lowe as part of the process of developing the recently acquired property into a Wildlife Management Area. One project was a survey of 3.4 km for an access road to the future headquarters complex; this included new survey area as well as improving existing graded ranch roads (Lowe 2017a). The current project area is just north of the existing road portion of the project. The other two projects were possible routes for a new waterline that would connect the headquarters complex buildings to a municipal water supply. One was a survey of 1.2 km of two alternate routes (Lowe 2017b), while the other was a 1.6 km survey for the preferred waterline route (Lowe 2017c).

The nearest archeological site to the proposed project area is roughly 5 km west. This site, 41PP309, is a small surficial lithic scatter on a rise in the Palo Pinto Creek floodplain. It

was recorded, along with several other sites, during a 1984 intensive pedestrian survey by Espey, Huston, and Associates (subsequently PBSJ Corporation and now Atkins) for an overhead powerline for the Brazos Electric Power Cooperative.

Fourteen archeological sites were recorded along Palo Pinto Creek, east-northeast of the WMA boundaries, as part of a 2010 survey by Geo-Marine for the proposed Turkey Peak Reservoir project. Several of these are prehistoric sites with buried components and were recommended for significance testing excavations.

METHODS

TPWD Archeologist John D. Lowe conducted an intensive pedestrian survey of the 1.5 ac new office building project area on 24 September 2018.

Lowe walked the entirety of the project area, examining the surface both for cultural materials and potential for deposits. Ultimately, no shovel tests were excavated based on the shallow soils, observed sandstone bedrock outcroppings, previous construction disturbances, and shovel test results in the vicinity.

The THC minimum survey standards for a project area of less than two acres calls for three shovel tests for every acre, or three shovel tests. The current investigations fell short of this standard. However, the THC survey standards also state that shovel tests are excavated in settings with potential for buried cultural materials. The investigator determined that the setting was not conducive for buried materials.

All sites, isolated finds, and features were documented using photographs, field notes, and a GPS point. Due to the limited amount of previous work in the area, a low threshold

for distinguishing a site from an isolated find was in use for this project. A density of one artifact per square meter, with a minimum of six artifacts, was selected as the requirement for determining a site. The presence of burned rock, chipped stone tools or a variety of artifact types could also be a determining factor. Non-diagnostic isolated historic artifacts and prehistoric lithic debitage, following an examination of the ground surface in the vicinity, were noted but not documented. Temporally diagnostic artifacts, artifacts believed to be at risk of uncontrolled collection, and artifacts recovered from shovel tests were collected and curated in the TPWD Archeology Lab curatorial facility. No artifacts were encountered or collected during this project.

RESULTS

The early fall weather was warm and cloudy. Access was easily available via the main ranch road, which runs adjacent to the southern portion of the project area.

The survey area is a grassy former pasture area with a few trees primarily located along the boundaries (Figure 3). Rare sandstone bedrock outcrops were present across the



Figure 3. Overview of project area. View to north.

project area. Surface visibility was moderate, averaging 30% to 40%.

Disturbances within the project area were limited and primarily related to the construction and maintenance of a pasture fence and probable vegetation clearing. There was no evidence of plowing in the survey area.

A formal surface reconnaissance of the project area was conducted to identify materials and assess the potential for buried deposits. No cultural resources were noted on the surface within the project area. Three shovel tests were excavated within the project area. A test at the wooden stake marking the proposed building spot encountered dark brown (7.5YR 3/3) sand to 25 cm below surface (cmbs) followed by strong brown (7.5YR 4/6) sandy loam with sandstone gravels and chunks from 25 to 35 cmbs, overlying sandstone bedrock. Two other tests, one in the northeast part and one along the western edge of the survey area, encountered similar soils. Both tests encountered 15 cm of brown (7.5YR 3/3) sand, followed by a layer of brown (7.5YR 4/4) sandy loam from 15 to 40 cm, and a layer of strong brown (7.5YR 4/6) sandy clay loam from 40 to 50 cm overlying reddish brown basal clay (Figure 4). All three tests were negative for cultural materials.

No cultural resources were encountered during the survey.

CONCLUSION

The new office project involves construction of a new building with associated utilities within a roughly 0.5 ac area west of the existing barn/shop building. Primary impacts will include clearing and grading for the foundation, and installation of buried utilities including water and possibly phone. Other impacts may include clearing of select



Figure 4. Representative soil profile.

trees and construction of a paved or gravel driveway and parking lot. Anticipated depth of disturbance will be less than 15 cm for the foundation, and a maximum of 1 m for any buried utilities. The work will be conducted by an experienced contractor.

The file searches and intensive pedestrian survey of the 1.5 ac project area found that it consists of relatively shallow, in situ soils with minimal potential for cultural resources. As the project includes federal funding, an intensive pedestrian survey was required in accordance with Section 106 of the National Historic Preservation Act.

Three shovel tests were excavated during the survey. Shovel tests were excavated judgmentally, distributed across the project area. All were negative for cultural materials.

TPWD recommended, and THC concurred, that construction of the new office building with associated utilities, driveway, and parking lot should have no adverse effect on the cultural resource base at the WMA. TPWD also recommended, and THC concurred, that if any cultural materials are encountered during the project then work should halt in the immediate area of the possible archeological site and a professional archeologist be called to document the nature of the unanticipated discovery. If the materials are determined to be of cultural origin more than 50 years old, then further consultation will be conducted with the THC to ensure that the resources have been documented and impacts mitigated.

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INTENSIVE CULTURAL RESOURCES SURVEY OF 120 ACRES OF PROPOSED DOVE HABITAT RESTORATION AT ROGER R. FAWCETT WILDLIFE MANAGEMENT AREA, PALO PINTO COUNTY

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ABSTRACT

Texas Parks and Wildlife Department plans to take down dead standing honey mesquite and improve native grass and forb cover in a roughly 120 ac area in the southern part of the Roger R. Fawcett Wildlife Management Area to improve nesting and brood rearing habitat for game birds and other grassland species. The trees will be brought down utilizing a dozer/crawler tractor, with an aerator attachment on the tractor making the aeration holes in the soil. Anticipated depth of soil disturbance during tree removal will be 15-20 cm. The work will be conducted by an experienced contractor and monitored by WMA staff. An intensive pedestrian survey was conducted over two weeks in June and September 2018. This included the excavation of 52 shovel tests. One small prehistoric open campsite, 41PP420, and three isolated finds were documented during the survey; none were recommended for avoidance.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) plans to use state funds to restore grassland wildlife habitat at the Roger R. Fawcett Wildlife Management Area (WMA). This project will serve the TPWD mission of managing natural resources as well as providing hunting opportunities.

The WMA consists of roughly 5,400 ac of the former XO Ranch lands in Palo Pinto County, Texas (Figure 1), acquired by the Texas Parks and Wildlife Foundation in 2015 and turned over to TPWD. This land is one of the best remaining examples of Cross Timbers habitat left in the state. The current project area consists of two previously plowed fields totaling roughly 120 ac in the southern part of the WMA (Figure 2).

The proposed project will take down dead standing honey mesquite and improve native

grass and forb cover in a roughly 120 ac area in the southern part of the WMA to improve nesting and brood rearing habitat for game birds and other grassland species. The trees will be brought down utilizing a dozer/crawler tractor, with an aerator attachment on the tractor making the aeration holes in the soil. Anticipated depth of soil disturbance during tree removal will be 15-20 cm. The work will be conducted by an experienced contractor and monitored by WMA staff.

A background review indicated that the area has not been previously surveyed, and no previously recorded archeological sites are present. Project area soils are primarily alluvial and consist of sandy loam and sandy clay loam soils of varying degrees of thickness over sandy, with a few areas of more shallow clay loam soils.

Roger R. Fawcett Wildlife Management Area

Palo Pinto Creek Reservoir

TEXAS
PARKS &
WILDLIFE

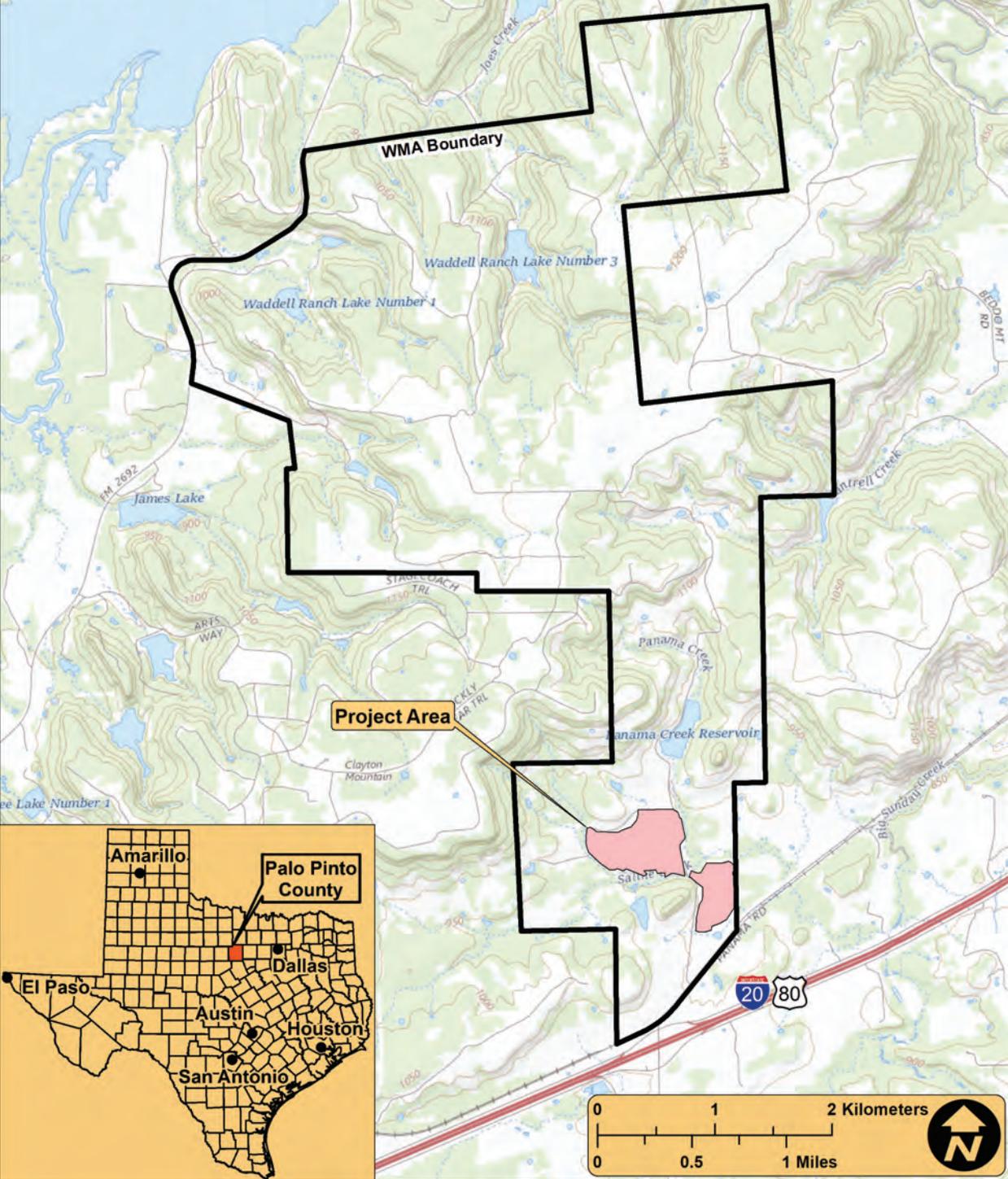


Figure 1. Topographic map showing project area.



Figure 2. Recent aerial imagery showing project area.

ENVIRONMENTAL BACKGROUND

The project area is an upland prairie bisected by the Saline Creek basin, which is quite broad within the project location. The Panama Creek basin is just east of the northern field, and this creek has its confluence with Saline Creek just north of the southern field. Several smaller tributaries also flow into the basin along the western edge of the northern field, and southern edge of the southern field. The soils and geology of the project area reflect this setting. The alluvial soils were likely the reason this area was selected for plowed agricultural fields.

The geology of most of the southern field, and roughly half of the northern field, is mapped as Holocene aged Quaternary Alluvium (USGS 2018). These are floodplain deposits, including low terrace deposits near the floodplain level and possibly bedrock in the stream channel.

The southwest corner of the southern field and the northern half of the northern field are mapped as the Mingus Expanded of the Pennsylvanian period Des Moines Series (USGS 2018), which formed roughly 300

million years ago. In southern Palo Pinto County, this formation consists of lentils of sandy, fossiliferous limestone roughly 60-cm thick, overlying a thick sandstone layer and subsequent limestone layer (USGS 2018). This is not a chert-bearing formation.

There are five main soil types present in the project area. Roughly 38% (46 ac) is mapped as May fine sandy loam, 0-1% slopes. This is a loamy alluvium formed on the tread of stream terraces (Natural Resources Conservation Service [NRCS] 2018). The typical profile is fine sandy loam at 0-40 cm, followed by three layers of sandy clay loam from 40-100 cm, 100-130 cm, and 130-200 cm (NRCS 2018). The soil gets calcareous with depth. This soil type is the most common in the northern field.

Roughly 16% (19 ac) of the project area is mapped as Santo and Bunyan soils, 0-1% slopes, frequently flooded. These are soils formed on level floodplains from loamy alluvium (NRCS 2018). The typical profile for Santo soils is fine sandy loam from 0 to 20 cm, followed by four C horizons: loamy fine sand at 20-30 cm, fine sandy loam from 30-80 cm, loamy fine sand at 80-110 cm, and fine sandy loam at 110-200 cm (NRCS 2018). The typical profile of Bunyan soils is fine sandy loam at 0-15 cm overlying two sandy clay loam C horizons from 15-40 cm and 40-200 cm (NRCS 2018). This soil type is in those portions of the project area closest to Saline Creek.

Thurber clay loam, 1-3% slopes, is also mapped in roughly 16% (18 ac) of the project area. This soil forms on the toe and base slope of ridges from clayey slope alluvium derived from claystone (NRCS 2018). The typical profile is clay loam at 0-10 cm, followed by two Bt clay horizons at 10-100 cm and 100-130 cm, followed by a clay loam BC horizon at 130-200 cm (NRCS 2018). This soil type

is mapped only in the southern field, where it is the common soil type, present in the southern half of the field.

Roughly 14% (16.5 ac) of the project area is mapped as Blanket clay loam, 0-1% slopes. This soil forms on the toe and base slope of ridges from loamy and/or clayey slope alluvium (NRCS 2018). The typical profile is four layers of clay loam that get progressively more calcareous, starting with a plowed A horizon at 0-45 cm, followed by a Bt horizon from 45-60 cm, a BK horizon from 60-120 cm, and finally a BCK horizon from 120-200 cm (NRCS 2018). This soil type is mapped only in the eastern part of the northern field.

Truce fine sandy loam, 1-5% slopes, eroded is mapped across roughly 11% (13.5 ac) of the project area. This soil is found on side slopes and foot slopes of ridges, formed from loamy colluvium and/or loamy slope alluvium over clayey residuum weathered from claystone and/or sandstone (NRCS 2018). The typical profile is fine sandy loam at 0-10 cm overlying two clay layers, at 10-100 cm and 100-200 cm (NRCS 2018). This lower clay layer is essentially claystone bedrock. This soil type is found along the northern edges of the northern field.

Finally, roughly 7% (8 ac) of the project area is mapped as Vashti loamy fine sand, 1-5% slopes. This soil is formed on the backslopes of hills and is sandy residuum weathered from sandstone (NRCS 2018). The typical profile is loamy fine sand from 0-40 cm overlying sandy clay loam from 40-80 cm. Below this is sandstone bedrock (NRCS 2018). This soil is mapped in the north-central part of the northern field.

Based on a review of the soils and geology, the project area has a moderate probability for prehistoric cultural resources, including buried cultural resources. The alluvial

setting has potential for buried deposits, as flooding can bury existing surfaces under new sediments, forming new surfaces. Previous plowing in the project area would have impacted the current ground surface to a depth of 30 cm, but the Holocene alluvial sediments may extend beyond this depth.

CULTURAL BACKGROUND

The WMA lies within the North-Central Texas Archeological Region (Perttula 2004:7 Figure 1.1). Human occupation of the north-central Texas Hill Country began at least 11,000 years ago, with recent evidence suggesting that it may have started a couple of thousand years earlier. Archeologists generally recognize what are interpreted as a series of culture changes, predominately through shifts in the morphology of diagnostic projectile points and other tools along with the introduction of, and changes to, substantial features. Alterations in the material culture can be delineated and correlated to climatic changes to contribute to an understanding of human adaptations in the region.

The prehistoric cultural sequence is generally divided into three main periods: Paleoindian, ca. 9250 to 6850 B.C.; Archaic, ca. 6850 B.C. to A.D. 700; and Late Prehistoric, A.D. 700 to 1650 years, with subperiods delineated within each major period, reflecting distinctive archeological patterns (Collins 2004:112-113, 116-123).

The commonly accepted Paleoindian sequence in central Texas begins with the Early Paleoindian, which coincides with the end of the Late Pleistocene era and the extinction of Pleistocene megafauna. The sequence starts with the Clovis point, a distinctive long, thin, fluted lanceolate type, and an associated tool assemblage, dating from ca. 9250 to 8950 B.C. (Collins 2004:116). Once thought of as consisting solely of big-

game hunters preying on mammoth, bison, camelids, and horses, Clovis subsistence is now known to be broad-based and diverse, including smaller game and plants (Bousman et al. 2004:75; Collins 2004:117). The Clovis period is followed by periods marked by Folsom, Midland, and Plainview points and assemblages, which date from roughly 8950 to 8050 B.C. (Collins 2004:113). This period is associated with intensive hunting of *Bison antiquus*, a larger Pleistocene ancestor of the modern bison, although other faunal remains are also found at sites (Bousman et al. 2004:80-82).

The Late Paleoindian period begins around 8000 B.C., with the onset of the Holocene era (Lohse and Bousman 2006:12). The Holocene brought dramatic changes, with warmer temperatures and wetter conditions, which were accompanied by shifts in settlement, mobility, subsistence, technology, and social practices (Bousman et al. 2004). The extinction of the Pleistocene megafauna necessitated a shift to smaller game. The wider variety and limited distribution area of Late Paleoindian compared to Early Paleoindian projectile point types indicates smaller settlement ranges (Lohse and Bousman 2006:12). Late Paleoindian diagnostic projectile point types in Texas include Wilson, Dalton, St. Mary's Hall, Golondrina, Barber, and Scottsbluff. Wilson points are the earliest true stemmed projectile points in Texas, while the others are more traditional Paleoindian lanceolate points.

The Archaic period is marked by changes in material culture, subsistence, mobility, and other behaviors that persisted with only minor modifications for over 7,000 years. These include intensified hunting and gathering of local resources, including a greater reliance on plants. One of the most significant elements of Archaic lifeways is reflected in the increased use of hot rock

cooking in hearths, ovens, and middens (Collins 2004:119; Lohse and Bousman 2006:13). There is a greater diversity in chipped stone tool types, including woodworking tools such as Clear Fork and Guadalupe bifaces, and ground stone technology becomes common (Collins 2004 119-120; Lohse and Bousman 2006:13). The Archaic period is subdivided into the Early Archaic (6850 to 4050 B.C.), Middle Archaic (ca. 4050 to 2050 B.C., and Late Archaic (ca. 2050 B.C. to A.D. 750) periods (Collins 2004:118-121).

Early Archaic populations are thought to have been small and highly mobile, but large, extensive deposits at sites such as Wilson-Leonard (41WM235) in Williamson County, Gault in Bell County, and Kennedy Bluffs (41BP19) in Bastrop County suggest that these groups converged at favored places during certain times of the year (Lohse and Bousman 2006:13). Many Early Archaic components are situated near the eastern and southern margins of the Edwards Plateau, in the better-watered parts of the live oak savanna habitats (Collins 2004:119-120). Collins identified three projectile point style intervals for the Early Archaic: Angostura, early split-stem (Gower and Hoxie), and Martindale-Uvalde (Collins 2004:119).

The Middle Archaic period starts around 4000 B.C., with a shift in the climate that is reflected in a change in lithic technology. A more mesic climate led to a significant increase in bison in Central Texas and movement of people from the prairie margins and woodlands, following the bison into central Texas. Their tool kit included specialized bison-hunting weaponry marked first by Bell, Andice, and Calf Creek points, followed by Taylor and Early Triangular points (Collins 2004:120; Johnson and Goode 1994:24-25).

The mesic period would end with the onset of the warm, dry Altithermal around 3000 B.C., during the Taylor-Early Triangular style interval. This shift to xeric conditions is associated with the introduction of the burned rock midden, a hallmark feature prominent across central Texas. Burned rock middens build up from the use of ovens that have rocks as heating elements, where xerophytic succulents such as stool were roasted. Over time middens accumulated on stable landforms as heavily fractured rocks are discarded (Collins 2004:121). The Nolan-Travis style interval, at the end of the Middle Archaic period, represents another technological shift away from the bison-hunting tool kit (Collins 2004:120-121). The xeric climatic conditions peak towards the end of this interval, although the dry climate of the Altithermal would continue for centuries (Collins 2004:115, 121).

The Late Archaic period began around 2000 B.C., following the peak of the Altithermal, and conditions would eventually become substantially more mesic (Collins 2004:121). Across Central Texas and much of Texas as a whole, the Late Archaic period saw more intensive use of sites, indicating either increased populations, more frequent use of sites, and/or longer occupations (Johnson and Goode 1994:36; Prewitt 1981:73-74, 79-82).

Collins (2004:121) notes six style intervals for the Late Archaic, based on projectile points recovered from good stratified contexts. The first is the Bulverde type, followed by the Pedernales type, the most common dart point type in Central Texas (Turner et al. 2011:148), suggesting that population increases had become substantial. During the subsequent, slightly overlapping Lange-Marshall-Williams style interval, xeric conditions slowly begin to lessen (Johnson and Goode 1994:35). Marine shell

ornaments begin to appear in Central Texas during this time, indicating probable contact with coastal peoples, or at least the existence of a trade network (Prewitt 1981:80). Bison may have reappeared in Central Texas during this interval and were present during the succeeding Marcos-Montell-Castroville style interval. While bison hunting contributed to overall diet, a broad-based subsistence was practiced (Johnson and Goode 1994:35-36; Prewitt 1981b:73-74, 81).

A rather significant shift in both projectile point styles and broader cultural practices begins around 600 B.C. (Johnson and Goode 1994:36); Prewitt (1981:81-82) also notes these changes but uses a much later start date. Collins (2004:122) summarizes these as “diverse and comparatively complex archeological manifestations” that attest “to the emergence of kinds of human conduct without precedent in the area.” Some causal factors that have been cited include population growth and influence from groups in the eastern United States. This is reflected in the archeological record by “ceremonial” items including marine shell artifacts such as pendants and gorgets, elaborate bone ornaments, and atlatl weights and other stone objects of exotic material (Johnson and Goode 1994:37-38; Prewitt 1981:81).

The technological shift is reflected in the Ensor-Frio-Fairland projectile point style interval. These points are much smaller than the preceding periods, with narrow blades, and manufactured using more fine pressure flaking as opposed to broad billet flakes (Carpenter and Miller 2013:353; Johnson and Goode 1994:36). Both Ensor and Frio points are widespread across central and south Texas, while Fairland points are primarily found in central Texas; some analysts have noticed a gradation between these three dart point types (Turner et al. 2011:94, 99, 106).

The final interval of the Late Archaic is associated with Darl projectile points, a small, slender type. The Darl interval lacks exotic goods associated with extra-regional ties (Prewitt 1981:82), and there are also some indications that site occupations were less intensive (Carpenter and Miller 2013:352). In many ways, it seems to be an interruption of longer-term trends. Very little in terms of subsistence and economy changed from the Ensor-Frio-Fairland style interval through the Austin Phase of the Late Prehistoric (Johnson and Goode 1994:40).

The Late Prehistoric period begins in Central Texas around A.D. 700 (Johnson and Goode 1994:40) with the introduction of bow-and-arrow technology. This period is further divided into two distinct intervals: the Austin interval, followed by the Toyah interval (Collins 2004:122). Projectile point types associated with the Austin interval include Edwards, Scallorn, and Sabinal (Johnson and Goode 1994:40). Evidence of arrow-wound fatalities from burials suggests a possibility of widespread hostilities taking place during the Austin interval (Collins 2004:122-123).

The onset of the Toyah interval, around A.D. 1200, represents a significant shift in technology, cultural patterns, and subsistence base in central Texas (Collins 2004:123; Johnson and Goode 1994:41). Notably, these include the introduction of pottery (both locally produced and imported), prismatic blades, formal end scrapers, and thin beveled knives (Collins 2004:123). The dominant projectile point style is the narrow, strongly barbed, contracting-stem Perdiz arrow point, which is a distinctive design shift from the more triangular, expanding stems of the Austin phase arrow point types. The onset of the Toyah interval coincides with a drought that affected at least parts of the Edwards Plateau, during which bison herds moved south onto the Plateau

(Johnson and Goode 1994:41). The artifacts associated with the Toyah interval are generally considered to be part of a bison procurement and processing toolkit (Prewitt 1981:74, 85), possibly originating from the Plains to the north (Johnson 1994:287). The pottery assemblage includes several locally-made, bone-tempered types: the common Leon Plain, and the rare Doss Red and Boothe Brushed (Creel et al. 2013:32). Imported pottery includes Caddo types from northeast Texas, found in small quantities across all of central Texas (Creel et al. 2013:33).

The Toyah interval continues in central Texas until roughly A.D. 1700, with the first documented arrival of Europeans (Collins 2004:123). By this time, however, consequences of the earlier arrival of Europeans elsewhere in North America were already occurring throughout Texas, notably the southern advance of Apaches mounted on European horses, the conquest of Mesoamerica by the Spanish, and the spread of European-introduced diseases (Collins 2004:123). These all contributed to numerous displaced groups making their way into central Texas, such that the indigenous cultural patterns encountered by the early travelers and settlers do not represent direct analogs of prehistoric patterns. There were six groups of Indians, numbering 1,000 people, living along the Brazos in 1850 growing corn and other crops while also hunting game (Leffler 2018). Indigenous groups in the area included Delaware, Shawnee, Wichita, Tonkawa, and Caddo peoples, many of them displaced from their older homelands, as well as the wide-ranging Comanche and Kiowa groups (Leffler 2018).

The initial Euro-American land survey was made in 1837, when the area was on the western frontier of Euro-American settlement of Texas, although the first settlers didn't arrive until cattle ranches were established in

the mid-to-late 1850s. Palo Pinto County was established in 1856 from parts of Bosque and Navarro Counties, with the town of Golconda (renamed Palo Pinto in 1858) as the county seat (Leffler 2018). Early relations between the Euro-American settlers and the Natives who occupied the area were said to be good, but quickly became hostile as more settlers moved in and became more violent towards the Natives. The Brazos Indian Reservation, was founded in 1854 to hold the Natives, who were largely destitute bands displaced from their homelands, as discussed above. This did not decrease violence between the two groups, and the settlers also blamed the reservation Natives for raids by Kiowa and Comanche parties. In 1856 the Texas Rangers rounded up the Brazos Reservation Indians and moved them to two reservations established further up the river in Young and Throckmorton counties. The removal did not end the conflict, however, for settlers complained that reservation Indians continued to steal cattle, and some settlers threatened to attack the reservations. Eventually the Indians were removed from their Brazos reservation to Indian Territory (Oklahoma), allowing settler populations to boom, particularly along the old Fort Worth-Fort Belknap road (Leffler 2018).

By 1860 there were 1,524 people, including 130 enslaved people, living in the county. Cattle and sheep were the dominant types of livestock, with 15,400 cattle and more than 3,200 sheep. Farmers grew mostly corn, wheat, and oats. Though crop farming was becoming better established in the area, the area's economy centered around cattle in the years just after the Civil War. By 1880 there were 648 farms and ranches in Palo Pinto County; of these, 476 were operated by their owners, 28 were operated by renters, and 144 were farmed by sharecroppers. Over 9,300 ac in the county were planted in

corn, the county's most important crop at that time, with another 2,425 ac devoted to wheat. Cotton was becoming an important cash crop, and 4,300 ac in the county were devoted to the fiber. As cropland in the county expanded, so did the number of livestock; by 1880 there were 42,400 cattle and 5,000 sheep grazing in the county. Nine manufacturing businesses, employing twenty workers, had been established in the county. The area's expanding population reflected its economic growth, as the census counted 5,882 people living in Palo Pinto County that year (Leffler 2018).

In 1880 the Texas and Pacific Railway built through the county, tying the area to national markets and encouraging farming and further settlement; the towns of Brazos, Santo, Gordon, Mingus, and Strawn sprang up along the rail route (Leffler 2018). This line is still active and passes just south of the WMA near the current project area. Between 1880 and 1910, the number of farms and ranches in the county almost tripled, rising to 1,271 by 1900 and to 1,921 by 1910; meanwhile, the population of the county rose to 8,320 by 1890, to 12,291 by 1900, and to 19,506 by 1910. Though most of the new settlers were native-born whites, hundreds were foreign-born immigrants from Germany, Austria, England, Scotland, Italy, and other European nations. The county's African-American population also grew significantly during this period, rising from 67 in 1890 to 528 by 1910 (Leffler 2018).

The character of the local economy also changed during the last decades of the nineteenth century and the first years of the twentieth century. Sheep ranching dwindled away; only 163 sheep remained in the area by 1910. While cattle remained an important means of production, the number of cattle in Palo Pinto declined from 58,000 in 1890 to 28,700 by 1910. Meanwhile, crop

farming became ever more important, and cotton acreage expanded steadily, rising to 10,809 by 1890 and to 19,569 by 1900; by 1910 32,000 ac in the county were devoted to growing the fiber. As cotton production expanded, the number of acres planted in oats, wheat, and corn declined significantly; in 1910, for example, no wheat at all was grown in Palo Pinto, while less acreage was devoted to corn than at any time since the Civil War. Tenancy rates among the local farmers rose steadily as cotton cultivation expanded across the county. By 1910, almost half (919) of the farmers in the county were tenants (Leffler 2018).

The first test oil well in Palo Pinto County was drilled in 1901, although the oil boom did not happen until 1915. Oil helped offset some of the worst impacts from the Great Depression. Cotton production declined heavily during the Depression, along with corn, oats, and wheat; these were replaced by the introduction of peanut farming and huge growth in the raising of sheep and goats for wool and mohair. At the same time farms were consolidating and population declined. In the postwar era, oil and natural gas have continued to be a huge factor in the local economy, while farming declined. Tourism and recreation at area lakes and state parks are a prominent industry. Population peaked in 1970 at 28,962 although as of 2014 had nearly returned to that peak with 28,096 residents, primarily in the city of Mineral Wells, where over 60% of the county population resides (Leffler 2018).

The town of Santo, roughly 8 km northeast of the WMA, was founded by J. D. T. Bearden between 1850 and 1860 and was originally called Grand Ranch. A small makeshift fort was established in 1865. About 1870 the community moved to a site 1.6 km east of the present site on Sunday Creek, and its name was changed to Calgando; a series of name

changes ended in 1880 when the post office decided on the name Santo. In 1920 Santo had a population of 500 and a post office. In 1936 the population remained the same, but the town had 15 businesses and a bank. By 1940 the population had decreased to 350 and by 1980 to 312, where it remained in 1990. The population grew to 445 in 2000 (Hunt 2018).

Previous Investigations

The Texas Archeological Sites Atlas database and records maintained by TPWD indicate that three previous archeological surveys have been conducted within the WMA, and there are no previously recorded archeological sites within the WMA.

All three surveys were conducted in 2017 by TPWD Archeologist John D. Lowe as part of the process of developing the recently acquired property into a WMA. One project was a survey of 3.4 km for an access road to the future headquarters complex; this included new survey area as well as improving existing graded ranch roads (Lowe 2017a). The other two projects were possible routes for a new waterline that would connect the headquarters complex buildings to a municipal water supply. One was a survey of 1.2 km of two alternate routes (Lowe 2017b), while the other was a 1.6 km survey for the preferred waterline route (Lowe 2017c).

The nearest archeological site to the project area is more than 1.6 km to the south-southwest. This site, 41PP343 or the Lem Wolfe House site, is an early twentieth century two-room farmhouse ruins site with associated features. It was recorded during a 1995 intensive pedestrian survey by AR Consultants for the proposed Blue Flats Disposal Site. A 2001 review of the site ruled that it was ineligible for listing on the National Register of Historic Places (NRHP).

Fourteen archeological sites were recorded along Palo Pinto Creek, east-northeast of the WMA boundaries, as part of a 2010 survey by Geo-Marine for the proposed Turkey Peak Reservoir project. Several of these are prehistoric sites with buried components and were recommended for significance testing excavations.

METHODS

The author conducted an intensive pedestrian survey of the 120 ac dove fields project area from June 25 to 29, and September 24 to 26, 2018. The author walked either north-south or east-west transects at 30-meter intervals, depending on which was most convenient for proximity to vehicles, and excavated shovel tests arbitrarily across the project areas to assess potential for buried cultural deposits. Priority for shovel test placement was given to higher-probability locations in the alluvial soils.

Shovel tests measured 30 cm x 30 cm and were to be dug to a target depth of 50 cm when possible, exceeding the anticipated depths of impact. All sediments were screened through ¼" mesh screen. The soil colors, textures, and inclusions from each shovel test were recorded on a shovel test log. Each shovel test location was recorded using a Trimble GeoXT GPS unit. All shovel tests were backfilled following recording.

Over the course of the pedestrian survey, 52 shovel tests were excavated across the project area. The Texas Historical Commission (THC) minimum survey standards for a project of this size (101-200 ac) calls for one shovel test for every three acres, or 40 total tests. The current investigations significantly exceeded this standard, and TPWD made a good faith effort to identify and focus testing on areas with the highest likelihood for cultural deposits.

All sites, isolated finds, and features were documented using photographs, field notes, and a GPS point. Due to the limited amount of previous work in the area, a low threshold for distinguishing a site from an isolated find was in use for this project. A density of one artifact per square meter, with a minimum of six artifacts, was selected as the requirement for determining a site. The presence of burned rock, chipped stone tools or a variety of artifact types could also be a determining factor. Isolated historic features not related to a larger complex were recorded as isolated finds. Non-diagnostic isolated historic artifacts and prehistoric lithic debitage, following an examination of the ground surface in the vicinity, were noted but not collected. Temporally diagnostic artifacts, artifacts believed to be at risk of uncontrolled collection, and artifacts recovered from shovel tests were collected and curated in the TPWD Archeology Lab curatorial facility.

RESULTS

The early summer weather during the first field session was unseasonably hot and sunny, with extremely dry conditions. The weather was more moderate during the second session, and substantial rainfall in September had led to noted vegetation growth and softer soils within the project area. Access was via an established graded ranch road, portions of which are graveled, drivable only by all-terrain vehicles due to an extremely difficult hillside section. Travel from the bunkhouse to the project area was 30 to 40 minutes each way.

The survey area is largely situated on level stream terraces (Figure 3), although there is a gentle northwest slope in the northern field, and the most northern portions are along the toe of a ridge. No drainages are present within the project area, although a minor erosional wash is present in the southern part of the north field.



Figure 3. Overview of level creek terrace in most of the north field during summer session. View to north.



Figure 4. Overview of the sparse vegetation in the south field during summer session. View to north.

Vegetation was consistent with fallow fields/pasture in the Cross Timbers prairie setting. During the hot, dry summer, much of the south field and parts of the north field were covered in sparse non-native pasture grasses and forbs, some mesquite saplings, and rare succulents (Figure 4); the north field was generally greener with thicker vegetation. During the second session, which surveyed only the northern field area, the vegetation was much taller, thicker non-native pasture grasses and forbs (Figure 5). Mature hardwoods, primarily oaks, are present along the southeast fenceline of the northern field as well as the edges of the fields, which are largely riparian zones. A few mature hardwoods are also interspersed in the southern field.

The primary disturbance within the project area is many years of plowing for agriculture, although the fields have been fallowed and converted to pasture for at least 20 years. This may also have led to or accelerated erosion in parts of the project area. A gravel ranch road and fenceline crosses part of the northern project area. A natural gas pipeline (unknown whether still active) crosses the northern field in the eastern half, running roughly northwest to southeast. A couple of small areas of bioturbation by feral pigs were noted, but these were rare.

Over the course of the survey, 52 shovel tests were excavated; all were negative for cultural materials. Tests were excavated arbitrarily, with an emphasis on higher probability locations near drainages.



Figure 5. Overview of north field during fall session showing thicker grasses and forbs following several heavy rains. View to east.

The results generally did not match the descriptions of the mapped soil types; factors for this may include the previous plowing, erosion, drought, and improper field assessment. For example, the southern part of the south field is mapped as several layers of clay and clay loam, but in the field was interpreted as dry, compact silt loam and silty clay loam. In the northern fields, erosion and drought likely have led to much shallower basal clay soils than mapped. Nonetheless, all tests were excavated to at least the anticipated depth of impacts.

One site and three isolated finds were documented during this survey.

41PP420

Site 41PP420 is a small prehistoric open campsite located along an erosional rill in the northern field. Vegetation consisted of sparse short grasses in the eroded areas. Ground surface visibility was generally high, ranging from 40% to 100%. Soils were largely absent in the main part of the site. In the areas adjacent to the eroded section, the soils were 10 to 20 cm of dry, compact yellowish brown (10YR 5/4) sandy loam overlying impassably compact brown (10YR 4/4) clay loam.

Site 41PP420 was initially identified when several flakes and a mano were observed on an eroded wash surface. The surface in the vicinity was briefly examined on initial identification before returning to the transect survey. Additional artifacts were identified during the transect survey. Two of these were in concentrations of sufficient density to be designated as features. The site measures 36 m north-south by 120 m east-west, based on the extent of the artifact scatter (Figure 6).

Feature 1 is an artifact concentration on the north side of the swale, near the west edge of the site. The concentration measures 3.5 m north-south by 4.5 m east-west and includes four flakes and several small pieces of possible sandstone fire cracked rock (FCR).

Feature 2 is a FCR scatter and artifact concentration that may represent a deflated hearth. The feature is located along the north side of the swale, east of Feature 1, and measures 4 m north-south by 10.25 m east-west. The feature includes two areas of larger probable FCR sandstone chunks, 8 to 10 chunks total, as well as some smaller sandstone pieces (Figure 7). Two flakes are also within the area.

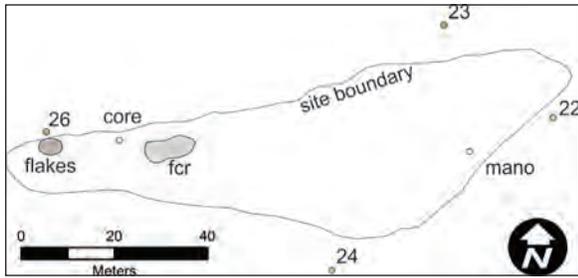


Figure 6. Sketch map of 41PP420 showing numbered shovel tests and surface artifacts.

Due to the deflated swale setting, no tests were excavated within the site limits, but four tests were excavated in the vicinity. One of these was adjacent to the edge of Feature 1. All four tests were negative, mostly encountering 10 cm of compact brown (10YR 5/4) sandy clay loam overlying impassably compact soil.

The artifact assemblage includes roughly 20 pieces of chert debitage, roughly 20 to 25 pieces of probable burned sandstone, a small chert or chalcedony core, and a shaped, smoothed quartzite mano fragment. No lithic artifacts diagnostic of a distinct temporal period, pottery, faunal remains, or datable organic material was noted.



Figure 7. Site 41PP420 Feature 2. View to north.

Site 41PP420 is a small, sparse open campsite that dates to the broad Prehistoric period. Cultural materials were recovered from the eroded swale surface and adjacent field surface. The research potential of the site is low, as the site is surficial, on a deflated, eroded surface in a previously plowed field. The site has no potential for datable organic remains or significant cultural deposits. Site 41PP420 is not recommended for official designation as a State Archeological Landmark (SAL), because it does not meet SAL Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). It is recommended as not eligible for listing on the NRHP under Criterion D. No avoidance is recommended for the site.

Isolated Finds

Three isolated finds were documented. The first of these is a distal-medial arrow point fragment made from black chert. Based on the parallel stem and straight base as well as the geographical location of the WMA, it is likely an Alba type point, which dates from AD 800 to 1200 (Turner et al. 2011: 177).

Isolated find #2 is a probable historic-aged livestock feeder crib, located along the south edge of the northern field near the creek (Figure 8). The crib is roughly 3-m long, 2.4-m wide, and 2-m high. It has a corrugated tin roof and wire nails were used for the construction, although a cut nail in one of the base boards suggests the use of some reclaimed wood. The footers are primarily sandstone field slabs, but also one cinder block. The crib dates to some point in the twentieth century, based on the nails. It may be less than 50 years old, as there would be little need for a livestock feeder adjacent to an agricultural field. No artifacts were identified in the vicinity.

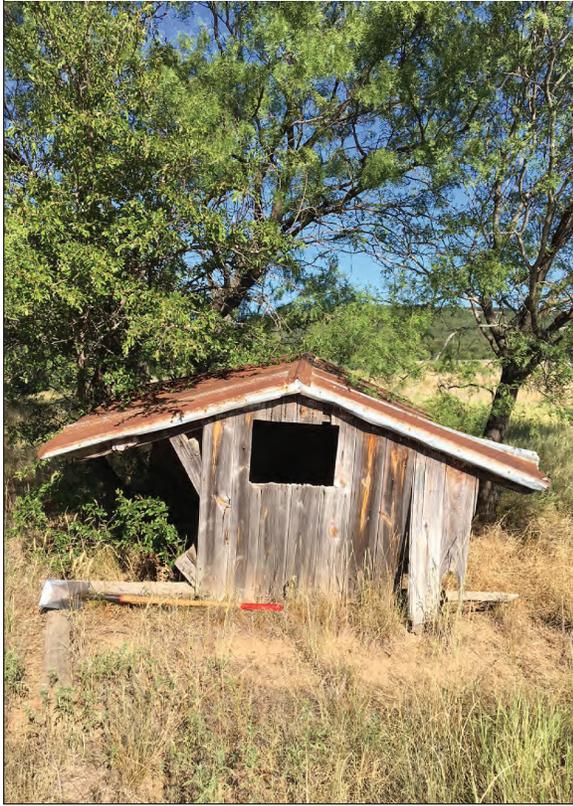


Figure 8. IF2, a possible historic livestock feeder crib. View to west.



Figure 9. IF3, a probable historic wellhead. View to west.

Isolated find #3 is an old well head, consisting of a 4.5-cm diameter pipe collared by a larger nut within a PVC pipe casing (Figure 9). The piping extends 40 cm above the ground surface. One sandstone slab in the vicinity may be an old windmill footer.

The isolated finds do not require any further work or avoidance within the project area.

CONCLUSION

The proposed project will take down dead standing honey mesquite and improve native grass and forb cover in a roughly 120 ac area in the southern part of the WMA to improve nesting and brood rearing habitat for game birds and other grassland species. The trees will be brought down utilizing a dozer/crawler tractor, with an aerator attachment on the tractor making the aeration holes in the soil.

Anticipated depth of soil disturbance during tree removal will be 15-20 cm. The work will be conducted by an experienced contractor and monitored by WMA staff.

A background review indicated that the area has not been previously surveyed, and no previously recorded archeological sites are present. Project area soils are primarily alluvial and consist largely of sandy loam and sandy clay loam soils of varying degrees of thickness over sandy, with a few areas of more shallow clay loam soils.

The intensive pedestrian survey of the 120 ac formerly plowed fields found that the project area consists of relatively shallow soils with minimal potential for cultural resources. All 52 shovel tests excavated across the survey area were negative for cultural materials.

One new archeological site and three isolated finds were documented within the project area over the course of the survey. The isolated finds include an arrow point (collected), a well head that may indicate an old windmill location, and a feed crib; the well head and crib are on the edges of the survey area would not be impacted by the proposed project.

Site 41PP420 is a small, sparse open campsite that dates to the broad Prehistoric period. Cultural materials were recovered from the eroded wash surface and adjacent field surface. The research potential of the site is low, as the site is surficial, on a deflated, eroded surface in a previously plowed field. The site has no potential for datable organic remains or significant cultural deposits. Site 41PP420 is not recommended for official designation as a SAL, because it does not meet SAL Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). It is recommended as not eligible for listing on the NRHP under Criterion D. No avoidance is recommended for the site.

TPWD recommended, and THC concurred, that the grassland habitat restoration project should have no adverse effect on the cultural resource base at the WMA. TPWD further recommended, and THC concurred, that if any additional cultural features or bones are encountered during the project then work should halt in the immediate area of the possible archeological site and a professional archeologist be called to document the nature of the unanticipated discovery. If the features or bones are determined to be of cultural origin more than 50 years old, then further consultation will be conducted with the THC to ensure that the resources have been documented and impacts mitigated.

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POST PRESCRIBED BURN METAL DETECTING SURVEY FOR ONGOING PRAIRIE RESTORATION, SAN JACINTO BATTLEGROUND STATE HISTORIC SITE (41HR277), HARRIS COUNTY

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ABSTRACT

In December 2017, a metal detecting survey was conducted on 12 ac at San Jacinto Battleground State Historic Site prior to a prairie restoration effort. A single Mexican musket ball was discovered in the western portion of the project area immediately adjacent to and slightly above a small cut nail. In the central portion of the project area, archeologists discovered a concentration of early to mid-twentieth century metal scraps. While an arbitrary boundary was given to this concentration, similar metal scraps were found strewn across much of the project area. Archeologists found the entire eastern two thirds of the 12 ac parcel to be significantly disturbed with some cultural material buried at least one foot below the modern ground surface. There were several instances of picnic garbage located beneath the early twentieth century metal debris. TPWD found that the area did not contain any integrity and permitted the project to proceed as planned. Texas Historical Commission concurred with these recommendations in March 2018.

INTRODUCTION

San Jacinto Battleground State Historic Site (41HR277) in Harris County (Figure 1) was recently the focus of a prescribed burn. Texas Parks and Wildlife Department (TPWD) proposed to plant native seed mix on roughly 79.5 ac of the recently burned area (Figure 2) to restore the tall grass prairie that existed during the time of the battle in 1836. Staff proposed to use a tractor-mounted seed drill attachment to plant approximately 12 ac. The seed drill method was selected for the 12 ac area because this location burned relatively clean which facilitated the tractor and attachment. The rest of the area burned intermittently, making the use of machinery impractical. The depth of impact in the seed drill area was 5-10 cm. There was zero impact in the rest of the burned area where seed was hand sown.

In December 2017 the 12 ac subsurface impact area was examined with metal detectors and divot excavation by TPWD archeologists. The eastern one third of the project area seemed to be somewhat intact. A Mexican musket ball, discovered in the central eastern portion of the project area, however, was found in a questionable context. A dense concentration of metal scraps was encountered in the northwestern portion of the eastern two thirds near the Habermehl cemetery. This concentration was metal detected and flagged, but artifact recovery was left for a future investigation. An arbitrary boundary was given to the concentration, but remnants of this scrap pile were found scattered throughout the rest of the eastern two-thirds of the project area. While some of the scrap iron is historic, none appears to be battle related and most seems to be early to mid-twentieth century.

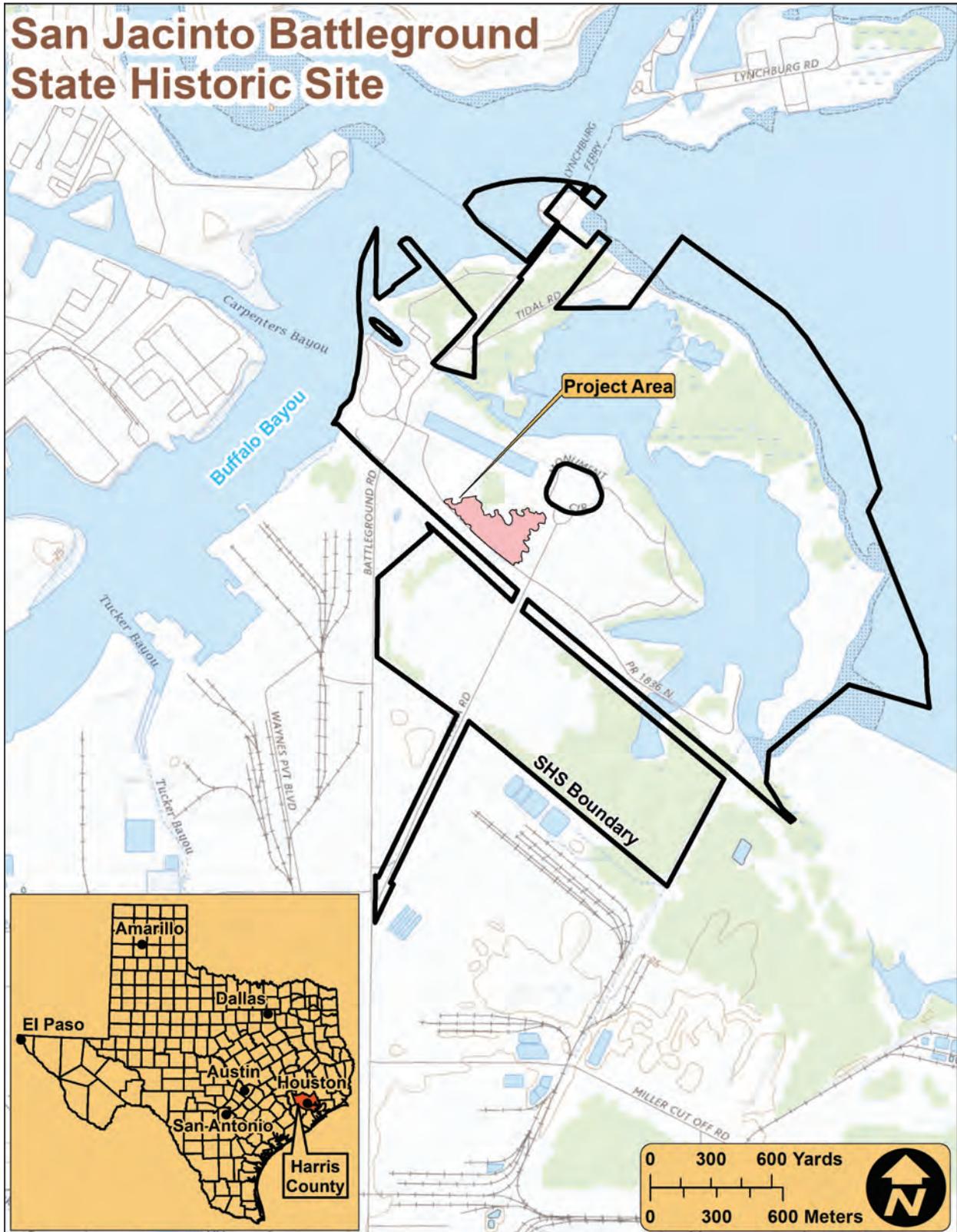


Figure 1. Topographic map showing project area.



Figure 2. Recent aerial imagery showing project area.

All work was completed by TPWD staff and volunteers. Because the project area exceeded 10 ac and a portion included subsurface impacts to a National Historic Landmark, it required a review under the Antiquities Code of Texas (Title 9, Chapter 191, Subchapter A) as specified in the MOU with the Texas Historical Commission (THC).

ENVIRONMENTAL BACKGROUND

The site exists within the West Gulf Coastal Plain physiographic area, which is comprised primarily of flat Quaternary alluvial-deltaic plains including the Pleistocene Lissie and Beaumont Formations (Blum and Aslan 2006). Multiple episodes of fluvial erosion and filling continued through the last glaciation, with little change until modern times when subsidence became apparent. Both subsidence and headward stream erosion are the products of groundwater and petroleum extractions. In the vicinity of the site, approximately 1.8 to 2.4 m of elevation have been lost to subsidence. A detailed discussion of the geomorphology, geology, hydrology and physiography of the San Jacinto River and Upper Galveston Bay can be found in Weinstein (1991) and Gadus and Howard (1990).

The general setting can be characterized as an ancient stream channel, a backswamp, coastal marsh and/or mud-flat deposits (Fisher 1982). These nearly level, clayey vertisols have a very high shrink-swell potential, and the formation of gilgais are common (Wheeler 1976). Gilgais are formed by an action known as argilliturbation, which causes the soils to shrink and crack when dry. Loosened soil spills into the crevices created by the shrinkage. When the soil is re-wetted it swells and denser, deeper clay works its way to the top, folding the upper surface soils below the crust taking, at times, artifacts with it. This creates a low mound and subsequent depression landscape.

The environmental setting at the San Jacinto Battleground was a very important component of the battle. The combination of swales, prominent landforms, bayous, marshes, bogs, and tall prairie grasses enabled the Texan forces to carry out a surprise attack on the Mexican encampment and defeat their enemy in a matter of minutes. The current project area is believed to have been the middle ground between the Texan and Mexican forces and is perceived to have been a path which Texans would have taken in their pursuit of the fleeing Mexican Army.

CULTURAL BACKGROUND

Archeological investigations along the state's upper coast have provided information that extends the prehistory of the Gulf Coastal Plains as far back as the Paleoindian period. Aten (1983), McGuff and Ford (1974), Aten et al. (1976), Patterson (1989) and Weinstein (1991) provide the best prehistoric culture chronologies and cultural explanations for the upper coast.

Usually, Texas prehistory is divided into four basic time periods, the Paleoindian, Archaic, Early Ceramic, and Late Prehistoric. The

upper coast, unlike other areas of Texas, contains more multiple component sites (Patterson 1989, Weinstein 1991). Because of this, Aten (1983) suggests that there is no definitive pattern of differential landform selection by temporal periods. Other than perhaps the Paleoindian period, there appears to be little change in the general subsistence economy despite the changes in lithic and other technologies.

The earliest sites within and near the site are Late Prehistoric shell middens, located along San Jacinto River, Buffalo Bayou, Santa Anna's Bayou, and Peggy Lake. Very few of these can be found today as most are either under a few meters of spoil or underwater, the result of dredging and subsidence.

There may have been other prehistoric sites within the current park boundary, but enormous landscape modifications conducted on the highest landforms of the battleground in the mid-1930s have eliminated any such evidence.

Even though the upper coast was under the political control of first Spain and then Mexico, there was little attempt to settle this part of Texas by either political entity. The first legitimate settlement by Anglo-American settlers were the "Old Three Hundred" (Looscan 1914). Of these settlers, Arthur McCormick and Nathaniel Lynch were most impacted by the battle at the confluence of the San Jacinto River and Buffalo Bayou. Arthur McCormick received title to his lands, which included the San Jacinto Battleground, in 1824. Around the same time that McCormick was establishing his homestead, Nathaniel Lynch began his enterprise east of the confluence of Buffalo Bayou and the San Jacinto River. In 1830, he developed the first ferry service. The small community that grew up around the ferry would become the small town of Lynchburg.

Immediately after the battle, Lynch established the town of San Jacinto at the southwest ferry terminal. The town, initially laid out along the edges of the battleground, crept southward and onto portions of the McCormick tract and the battleground by 1845. Santa Anna burned the little town of Harrisburg on his way to San Jacinto Battleground, so after Texas had won its independence the newly formed town of San Jacinto picked up a lot of Harrisburg's old business (Carter and Hole 1972:29).

San Jacinto commerce peaked around 1850. Their economy relied on a saw mill, two shipyards, blacksmith shops, mills, stores, and stables (Carter and Hole 1972:28-36). The little town hosted an armory during the Civil War, but the economy began a steady decline after the war, and the town had been abandoned by the early twentieth century. Today, any remnants of that little town are below water, another casualty of subsidence (Weed and Miller 1994).

The McCormick tract was subdivided, again and again (Carter and Hole 1972:36-47). Cattle grazing remained the primary economy during the nineteenth century. After some litigation, Conrad Habermehl ended up with the central portion of the battleground. He constructed a large home in the vicinity of the present day monument and established a family cemetery that is still in use and is located on the north-central edge of the current project area. The Habermehls also had a small dairy shed and a stable near the location of the cemetery.

Immediately after the battle, the Daughters of the Republic of Texas (DRT) began rallying for the Texas Legislature to acquire the battleground for the citizens of Texas (Cox and Tomka 2002). In 1883, the Texas acquired a 10 ac tract from Mr. J. Campbell. The overgrown tract he sold to the state

was, at the time, an active potter's field, a place to go and dig up or collect artifacts. Several other lots were acquired, and the battleground was eventually commemorated as one of the earliest public parks in Texas.

Since that eventful day in the spring of 1836, the San Jacinto Battleground became a place of pilgrimage. Soon after the battle, the battleground became a favorite picnic spot for relic hunters. Large and small monuments, placards, trees, cemeteries, cannon replicas, sculptures, and a mirror lake were all placed on the battleground to honor the fallen Texas heroes. In 1883, the State of Texas purchased the first 10 ac of what was to become the San Jacinto Battleground State Historic Site. When it became state property, picnicking continued along with continued battlefield memento hunting. The state constructed concrete picnic tables and slabs, comfort stations, dressing rooms and restrooms, roads, subsurface wastewater lines, water lines, fiber optic lines, and petroleum pipelines. There were towns plotted, homes built, pastures grazed, fields plowed, and large tractor mowing operations; all actions impacting the battlefield in their unique but destructive ways.

Previous Investigations

Mechanical trenching and auguring by Moore Archeological Consulting (MAC) was conducted across much of the site in 2003 (Mangum and Moore 2019). The primary purpose of this investigation was to determine the levels of disturbance or artificial fill in soils across the site in advance of future park operations to avoid impacting intact landscapes. There was no discussion of the metal artifact scatter, earlier roads, or the discovery of any other artifact within any of the eight backhoe trenches and sixteen auger excavations.

The data provided by the excavations helped to generate a map of the distribution of the soil conditions within the park. The map that MAC created suggested that the soil in the current project area, was, for the most part, intact. This further suggested that there was a potential to encounter in situ battle related artifacts (Mangum 2014).

METHODS

Before TPWD archeologists went into the field, the environmental setting, cultural setting, and historic impacts were researched in order to understand natural and cultural impacts to the landscape over time. The THC Archeological Sites Atlas and records housed at the TPWD archeological library were reviewed, and historic aerial photographs (e.g., Nationwide Environmental Title Research, LLC 1999) and historic topographic maps were also researched.

In December 2017, TPWD conducted a metal detecting survey of the approximate 12 ac seed drill area over a five-day period. While a 50 m grid was initially proposed for the metal detecting survey, it was abandoned when field conditions were physically observed. Even though this area was considered to be a clean burn, there were areas of dense vegetation which prohibited an expedient grid establishment. Instead, archeologists divided into groups of two. Each group, one using a metal detector and the other using the shovel, surveyed roughly 10-m wide swaths across the project area. Metal detectors used for the project included units by White, Fisher, and Minelab. The clay soils were very wet and dense. The Minelab was used to go back over heavily saturated areas when the Fisher or White did not sense any metal. The location of all artifacts was recorded with a Nikon Nivo M series total station. Due to limited time, none of the modern trash was documented but was

noted on field forms and plotted on field maps. Digital photographs were taken of in situ artifacts.

RESULTS

There were roughly 350 metal detector hits within the project area. The number of metal detector hits in the western one third of the project area was sparse. The bulk of discovered items here was modern trash and lost items. All picnic trash was collected and discarded but was not documented due to time constraints. A single Mexican musket ball was discovered in the western portion immediately adjacent to and slightly above a small cut nail (Figure 3). Ballistics research indicates that the ball probably hit something other than flesh (Scott et al. 2017).



Figure 3. One of several cut nails discovered during metal detecting survey.

In the north central portion of the project area, south and east of the Habermehl cemetery, a concentration of historic and modern metal scraps was encountered. The Minelab was used to define the metal concentration area. All metal hits were flagged but not excavated. A boundary was established around the heaviest concentration of the metal debris. The eastern two-thirds of

the project area contained a fairly constant supply of similar metal debris as well as the usual picnic trash. In a couple of instances, the picnic trash was below the historic debris suggesting significant soil disturbance. No evidence of the Habermehl stable remnant could be located.

In the southern portion of the project area, archeologists discovered the remnants of an earlier shell road. The construction and subsequent demolition of the old road systems gravely affected the integrity of those portions of the battleground. Road construction and demolition were not the only substantial modification at this location. When the 1920 topographic map is compared to a modern topographic map, the significant landscape alterations can be clearly seen. According to these comparisons, it seems that the entire project area had been leveled and the drainages filled (Figure 4). A later, 1940 photograph shows the leveled battleground (Figure 5).

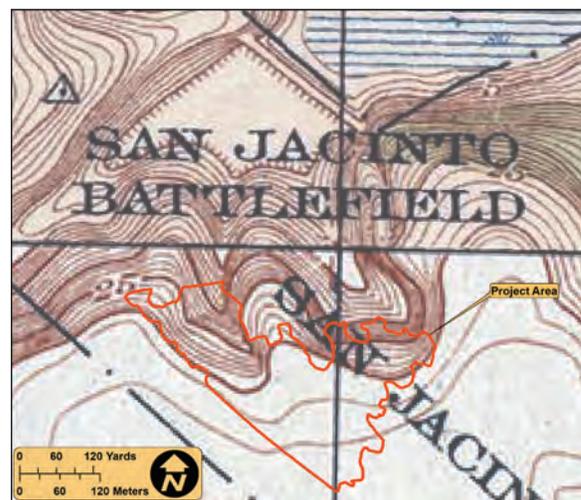


Figure 4. Portions of *La Porte* and *Burnett Bay* USGS Topographic Quadrangle maps (1916) depicting project area. Compare topography with that in Figure 1.

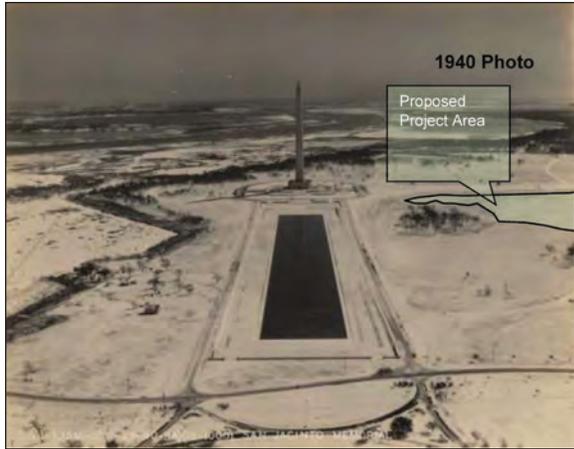


Figure 5. Historic photograph showing the leveled, park-like landscape in 1940.

The extent of the scattered metal across the eastern portion of the project area and 30-cm depth of many of these artifacts suggests the use of heavy equipment to move the original pile of scrap metal. Park staff informed archeologists that a historic homestead was rumored to have existed at that location. The artifacts present at this site, and the background review of historic topographic maps and aerial photographs, however, suggest otherwise. Not a single household artifact was encountered in any of the divots, nor were there any historic household artifacts present on the surface in or near the concentrated metal artifacts. The condition of most of the artifacts and the range in age suggests that this area was more than likely an early park operations related impact. Before cultural resources protection laws, this area, like other areas in the park, was more than likely altered to make it more park like.

This earthmoving activity may have affected the location of the discovered musket ball. Even though the area where the musket ball was discovered appeared to be more intact and contain less trash, the location of the

musket ball immediately adjacent to and slightly above a cut nail strongly suggests it is a secondary deposit rather than an in situ artifact.

While consistent with the Harris County Soils overall description (Wheeler 1976), most of the soil in the area has no real structure and contains bits of shell, modern trash buried up to 30 cm below the ground surface, and periodic encounters of mixed clay soils. The only soil that exhibited a variation from the typical black clay soil was at the location of the metal concentration. In this area, the soil was an uncharacteristic very dark brown to black clay loam. Because of the potential for the presence of a non-battled related cultural deposit or feature, the metal concentration area was avoided.

CONCLUSION

Because of previous landscape modifications, the types of artifacts discovered, the locations of their discovery, and the depths of these artifacts, TPWD believed that the discovery of, and/or the disturbance of intact cultural resources was highly unlikely in the proposed 12 ac seed drill area. The THC concurred with TPWD recommendations on 03 March 2018.

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ARCHEOLOGICAL SURVEY FOR THE OVERLOOK TRAIL PROJECT AT SOUTH LLANO RIVER STATE PARK, KIMBLE COUNTY

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ABSTRACT

Texas Parks and Wildlife Department conducted an archeological survey for a 1.4-km long trail project at South Llano River State Park in Kimble County. The entire trail corridor (0.9 ac) was subject to pedestrian survey, and one previously unrecorded archeological site, 41KM312, was recorded. The proposed trail was rerouted to avoid the site, and no significant cultural deposits or features occur within the project area. No further cultural resource investigations were recommended.

INTRODUCTION

In January 2018, Texas Parks and Wildlife Department (TPWD) Cultural Resources Program Staff conducted cultural resources investigations on South Llano River State Park located in Kimble County (Figure 1). TPWD proposes to install approximately 1.4 km of new trail totaling approximately 0.9 ac. This trail installation shall occur on lands owned and managed by TPWD. The project shall be funded, at least in part, by a National Recreational Trails Fund Grant, which is administered by TPWD under the authority of the Federal Highway Administration (FHWA) via the Texas Department of Transportation (TxDOT). Due to the federal funding component, TxDOT will conduct coordination for compliance with Section 106 of the National Historic Preservation Act with the Texas Historical Commission (THC).

The purpose of this project is to contribute to a more connective and sustainable trail network on the park. TPWD proposes to construct a new trail segment, the Overlook Trail, totaling approximately 1.4 km of new

trail. A 2.4-m wide corridor will be cleared of vegetation to accommodate a ca. 1-m wide natural surface trail tread, while the maximum depth of disturbance required for trail construction will equal approximately 50 cm.

ENVIRONMENTAL BACKGROUND

The park is located 6.4 km southwest of Junction on the right bank of the South Llano River in southwestern Kimble County (see Figure 1). The ca. 2,630 ac parcel includes 1.88 km of river frontage and over 2,000 ac of dissected limestone slopes and uplands. Elevation varies from 509 m AMSL in the northeast corner to 658 m AMSL at the south boundary.

The higher elevations in the park are underlain by Cretaceous age limestones of the Edwards Formation, locally manifested by the Segovia and Fort Terrett members (Barnes 1981). The Segovia member is a cherty limestone and dolomite, while the Fort Terrett member is limestone and dolomite with porcelaneous aphanitic limestone elements (Barnes 1981,

Robinson 1994). Below lies the Glen Rose Formation which consists of alternating layers of limestone and marl. A broad colluvial bench lies between the upland and bottomland zones of the park. The northern part of the park is underlain by Quaternary alluvial deposits (Barnes 1981).

Soils on the uplands and upland slopes are of the Tarrant and Real-Brackett map units and are described as very shallow to shallow undulating to steep, very cobbly, gravelly and loamy mollisols and inceptisols (Natural Resources Conservation Service [NRCS] 2015). Soils on the lower slopes, canyon outwash fans, and alluvial floodplains are of the Nuvalde clay loam map unit and are described as deep, nearly level to gently sloping, and loamy and very gravelly mollisols and inceptisols that developed on alluvium and colluvium (NRCS 2015).

Physiographically, the park is located within the Live Oak-Mesquite Savannah subregion of the Edwards Plateau, an area generally known as the Balconian biotic province (Blair 1950). Four general habitat types and associated plant communities occur within the area. These include alluvial terraces along the South Llano River, which support a deciduous forest dominated by pecan; toe-slopes and colluvial terraces, which support a mixed deciduous, highly disturbed woodland or shrubland; steep limestone slopes and narrow canyon bottoms, which support a deciduous or evergreen woodlands; and ridgetops, which support a mostly evergreen woodland mixed with short grassland (TPWD 1989).

CULTURAL BACKGROUND

The first professional archeological investigations within the park occurred during the TPWD master planning process between 1978 and 1991 (Ralph 1996:336-

341; 1997:207-211). Investigations included reconnaissance survey, systematic survey, subsurface testing, and monitoring of construction. In 1994, the Texas Archeological Research Laboratory (TARL), The University of Texas at Austin, completed analysis and reporting in fulfillment of the terms of Antiquities Permits 683 and 792 issued to Ron W. Ralph and Art Black of TPWD. Twenty-four historic and prehistoric sites were reported by David G. Robinson (1994).

An initial reconnaissance of the park was conducted in October 1978; isolated artifacts were observed and noted while the locations were later tested utilizing an auger (Robinson 1994). Three sites were discovered utilizing this technique: 41KM53, 41KM54, and 41KM55. Additional survey of the floodplain was conducted by Ron Ralph in October and November 1980 that resulted in the recording of sites 41KM70 and 41KM71. A boundary fence survey conducted in June 1982 resulted in the recording of 41KM72, and other small area surveys conducted in July 1984 and July 1985 resulted in no new discoveries.

In March 1988, Ron Ralph directed field investigation under Antiquities Permit 683 (Robinson 1994). These investigations included limited testing of 41KM73 in advance of park headquarters construction. Additionally, investigations and testing were conducted at 41KM90; a total of 174 artifacts was point plotted, and a prehistoric hearth was discovered and excavated ahead of construction for a camping loop.

In the spring of 1989, additional investigations and monitoring were conducted under Antiquities Permit 792 (Robinson 1994). Investigations conducted between March and May focused on the Buck Ranch Headquarters (41KM73), while

minor testing was carried out in other areas slated for development: the day-use area, the multi-use camping loop, the walk-in tent camping area, and two gas pipelines (Guy and Black 1989:2). Monitoring of park construction activities along with limited field investigations continued through July 1990 (Robinson 1994).

A pedestrian survey of the upland was conducted by Michael W. Davis in anticipation of fence and road upgrades (Robinson 1994:4). Six upland sites were recorded during these investigations: 41KM130-41KM134, 41KM136, and 41KM137.

Since park opening in 1991, approximately 25 projects have been coordinated through the TPWD Cultural Resources Program to ensure continued protection of the cultural resources at the park. The scope of these projects varied considerably, with many focused on maintenance, alteration, or repair of existing facilities. Utility line installation and upgrades comprise some of the more extensive impacts. While additional sites have been discovered and recorded, none of these later investigations have encountered new cultural deposits or features that are deemed significant.

METHODS

Prior to initiation of the field investigations, a comprehensive review of all available archeological reports and databases was conducted to identify and characterize cultural resources known to occur in the vicinity of the project area. At least in part, the compilation of known cultural resources in the South Llano River State Park area is based on the Texas Archeological Sites Atlas, Texas Historic Sites Atlas, and THC and TPWD map files. In addition, the literature and archival review inspected historic U.S.

Geological Survey (USGS) topographic maps and NRCS soil surveys (USGS 2018; NRCS 2015).

The fieldwork consisted of pedestrian survey in January 2018 in the proposed 0.9 ac project area. The pedestrian survey was performed using a single transect which was deemed adequate to assess the 2.4-m wide linear project area. Due to the surface visibility ranging between approximately 50% to 100% and the general lack of sediments in upland settings, shovel tests were deemed unnecessary.

RESULTS

A total of 0.9 ac was subject to archeological survey at the park. The purpose of the survey was to ensure that potentially significant cultural deposits or features would not be adversely impacted as a result of the proposed trail construction. The fieldwork consisted of 100% pedestrian of the proposed trail.

Background research indicated that no known prehistoric archeological sites exist within the proposed project area. One new archeological site was discovered during these investigations, 41KM312.

41KM312

The site is a lithic scatter, with evidence of lithic procurement activities that dates to the Late Paleoindian/Early Archaic periods. It is located on a bench overlooking an intermittent drainage that feeds the South Llano River (Figure 2). Vegetation on the site is sparse with long and short stem grasses, cactus, and a moderately dense cover of cedar, mesquite, and live oak. Chert and limestone cobbles and exposed bedrock are visible on the surface; ground surface visibility ranges between 50% and 100%. Site 41KM312 measures approximately 70

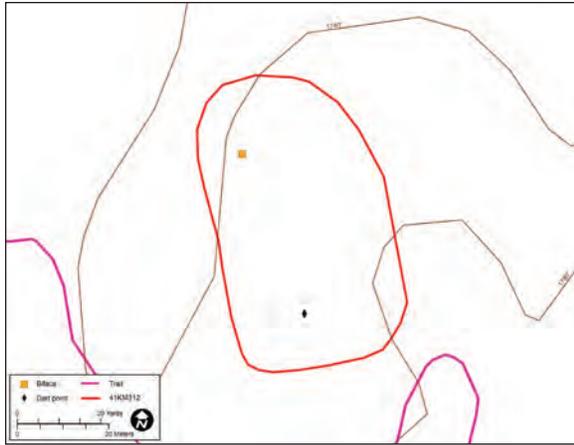


Figure 2. Sketch map of site 41KM312.

m north-south, 40 m east-west, and covers approximately 0.5 ac. It is defined by the bench landform, with the stream cutbank on the north and west sites, a steep slope to the east, and a hill on the south boundary. Artifacts observed include lithic bifaces, cores, debitage, and tested cobbles. One Late Paleoindian/Early Archaic Angostura dart point proximal fragment and a biface were collected from the surface (Figure 3).



Figure 3. Artifacts from site 41KM312.

The site is experiencing moderate erosion along the stream cutbank and moderate sheet erosion across the site; animal trampling is significant along the southeast boundary of the site. Site 41KM312 is deemed to have cultural deposits that are less than 40% intact. The site is not recommended for official designation as a State Antiquities Landmark (SAL) because it does not meet SAL Criteria 1 through 4, and it does not merit designation under Criterion 5 at this time because of its low artifact density and lack of features and intact deposits. Site 41KM312 does not appear to merit inclusion on the National Register of Historic Places (NRHP) under Criterion D. The trail segment initially proposed was rerouted to avoid further impacts to the site.

CONCLUSION

One new archeological site, 41KM312, was discovered during the survey. Although the site is not recommended for official designation as a SAL and it does not appear to merit inclusion on the NRHP, a proposed trail segment was rerouted to avoid further impacts to the site. Therefore, no known historic resources will be impacted by the proposed project. The TPWD Cultural Resources Program recommended that the proposed project be allowed to proceed without further cultural resources investigations. TXDOT/FHWA concurrence for this project was received in October 2018.

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INTENSIVE CULTURAL RESOURCES SURVEY OF 192 ACRES FOR GRASSLAND HABITAT RESTORATION AREA AT YOAKUM DUNES WILDLIFE MANAGEMENT AREA, COCHRAN COUNTY

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ABSTRACT

Texas Parks and Wildlife Department plans to reduce encroaching honey mesquite via mechanical grubbing and improve native bunchgrass and forb cover at Yoakum Dunes WMA to improve nesting and brood rearing habitat for upland game birds and other grassland species. The project area of potential effects consists of a 192 ac area in the north part of the WMA, with depths of impact anticipated to extend 30-60 cm. An intensive pedestrian survey was conducted in January and February 2018. This included the excavation of 156 shovel tests. Two archeological sites and one isolated find were documented during the survey.

INTRODUCTION

Texas Parks and Wildlife Department (TPWD) plans to use state and federal funds to enhance upland habitats for both game and non-game wildlife by reducing dense stands of woody vegetation and restoring native grassland habitats at the Yoakum Dunes Wildlife Management Area (WMA). Long-term habitat management plans on the WMA include improving upland habitats for both game and non-game wildlife, restoring grassland habitat for a suite of species including the Lesser Prairie-Chicken, Northern Bobwhite, and Blue Quail.

The WMA consists of 14,040 ac of ranch lands in Yoakum, Terry and Cochran Counties, Texas (Figure 1), acquired by the State of Texas in 2014. The primary habitat and species of interest for this new property is the Lesser Prairie-Chicken, which is under consideration for listing as a threatened species. The WMA consists of two non-contiguous parcels referred to as the GLO/Lewis and the Yoakum

Dunes Tracts. The current project area is located in the northeast and north-central parts of the Yoakum Dunes Tract (Figure 2).

The area is relatively undeveloped with few paved roads in addition to a few maintained dirt roads crossing the township/range grids along this part of the western Texas panhandle. Indeed, the only maintained roads in the main Yoakum Dunes area consists of County Road (CR) 1780, a north-south paved road near the eastern edge of the main parcel, and two unpaved east-west roads, CR 130 along the south edge, and CR 260 that winds through the north end of the Yoakum Dunes Tract. All the dirt roads are subject to rutting and periodically rendered impassible following intense rain and snow storms.

The proposed project will reduce encroaching honey mesquite via mechanical grubbing and improve native bunchgrass and forb cover in a roughly 192 ac area in the northern part of the WMA (see Figure 2) to improve nesting

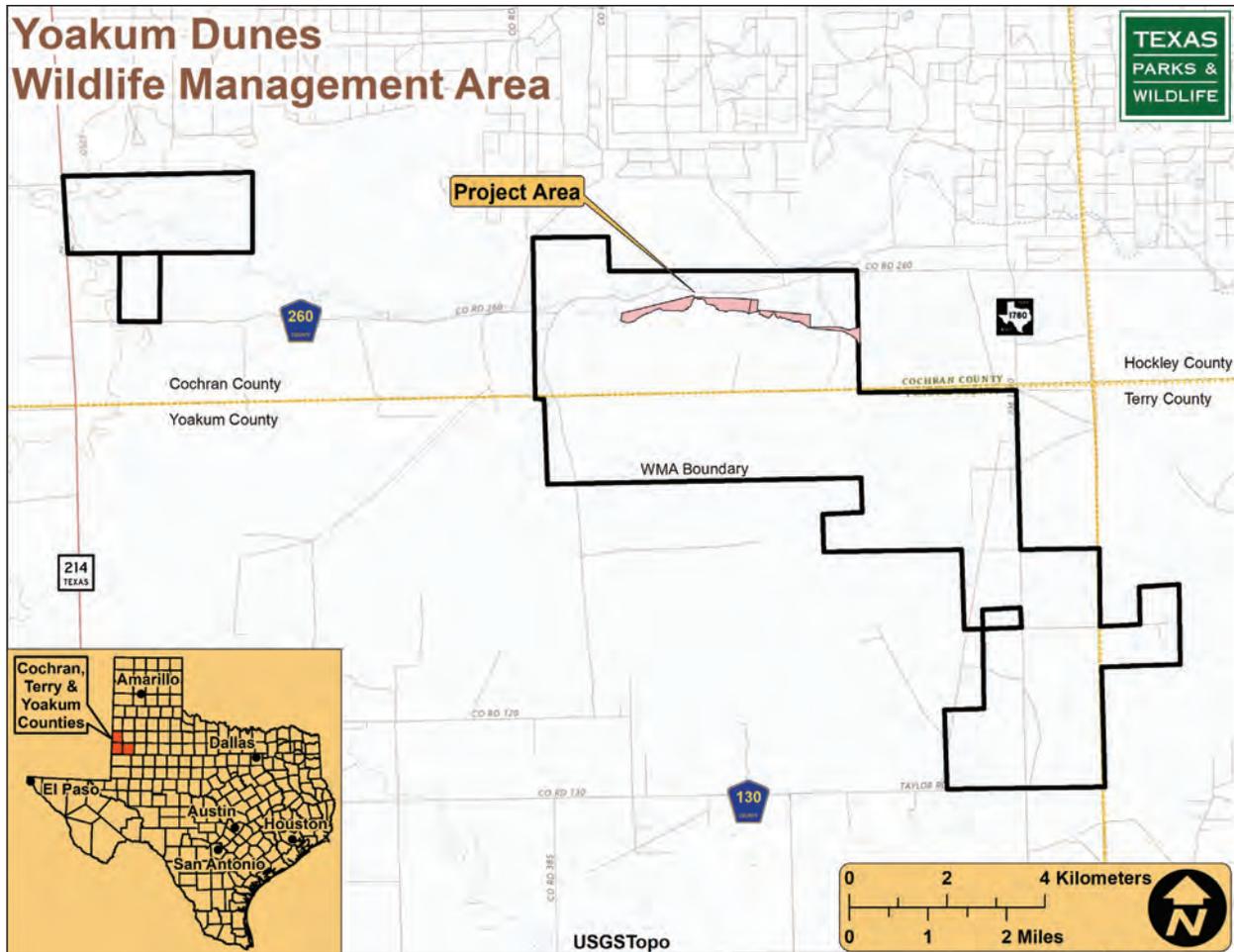


Figure 1. Location of WMA in Cochran, Terry, and Yoakum Counties.

and brood rearing habitat for upland game birds and other grassland species. The trees will be brought down utilizing an excavator equipped with a grubbing attachment. Because the soil texture is primarily fine sand, anticipated depth of soil disturbance during tree removal will be 30-60 cm. The work will be conducted by an experienced contractor and monitored by WMA staff.

A background review indicated that the area has not been previously surveyed, and no previously recorded archeological sites are present. Project area soils consist almost entirely of wind-borne fine loamy sands, and the geology indicates that these sands are

Holocene-aged deposits. No playa lakes are indicated on the geologic maps.

ENVIRONMENTAL BACKGROUND

The WMA is located some 75 km west-southwest of Lubbock on the Southern High Plains. Geologically, this region consists of gently rolling tableland that gently dips to the southeast in an area dominated by playa basins that periodically hold water. The WMA is located largely south of the South Fork of Sulphur Draw in southeast Cochran County, northeast Yoakum County, and northwest Terry County.

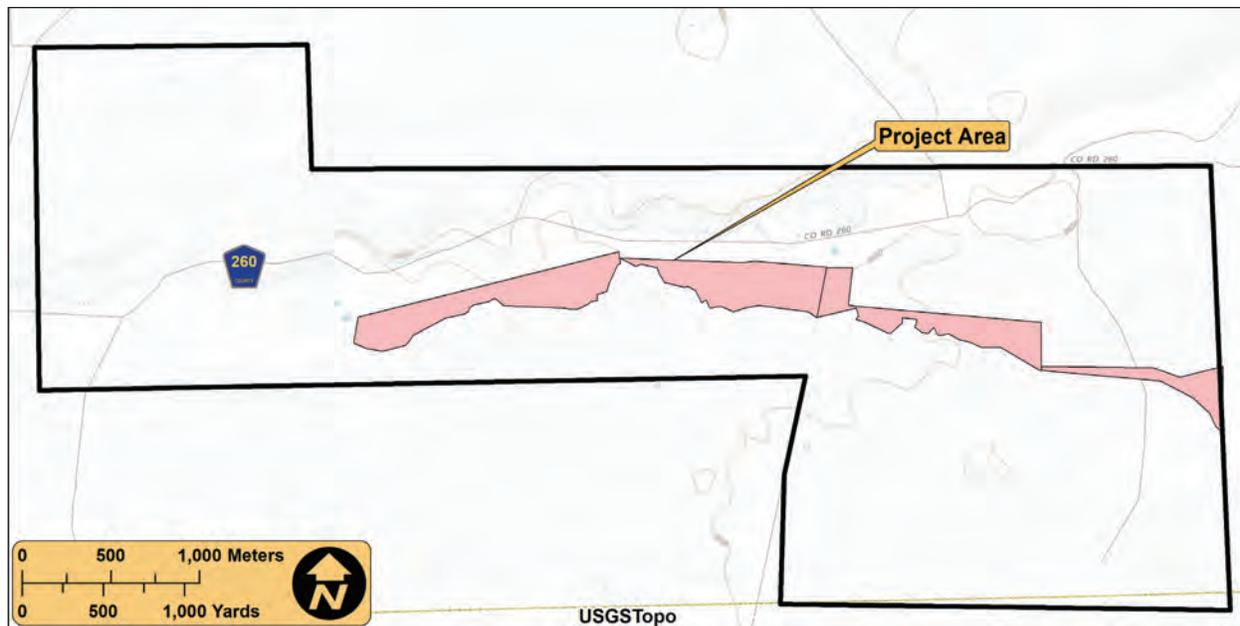


Figure 2. Topographic map showing project area in relation to tract boundary.

Existing infrastructure development on the WMA is relatively limited; one older ranch complex has been retained as a bunkhouse along the north edge of the main parcel, but the shortest access route crosses a neighboring private ranch. Several windmill complexes exist across the WMA, including one just north of the current survey area, but few areas that appear to have been plowed. Oil and gas developments are limited despite the proximity of the land to the Levelland-Slaughter Gas Field to the north and south of the WMA. A few buried pipelines cross parts of the WMA, including one that marks the northern extent of the far eastern part of the current project area. Very few power lines are available to service the facilities.

The geology of the project area is largely mapped as Holocene age sand sheets, dunes and dune ridges, undivided (U.S. Geological Survey [USGS] 2018). Some of the eastern portions of the project area are mapped as Holocene age cover sand (USGS 2018). An important geological formation that is

located just north of parts of the project area, within the draw basin, is the Pliocene age Ogallala Formation. This formation consists of fine to coarse-grain quartz sand, with silts in some parts, and some areas with caliche nodules. Gravels can be present locally, including pebbles and cobbles of quartz, quartzite, minor chert, igneous rock, metamorphic rock, and limestone. The caliche is white, gray, or pink sandy conglomerate, and comprises 4 or 5 beds up to 3.5-m thick, forming ledges and caprock (USGS 2018).

The majority of the project area, including most of the areas south of the county road, is mapped as Patricia and Amarillo loamy fine sands, 0-3% slopes (NRCS 2018). These are loamy eolian deposits from the Pleistocene Blackwater Draw formation formed on very gently sloping upland plains. The typical profile of the Patricia sections (50% of the formation) is loamy fine sand to 30 cm, two layers of sandy clay loam from 30-102 cm and 102-198 cm, and calcareous clay loam

from 198-203 cm (NRCS 2018). The typical profile of the Amarillo sections (40% of the formation) is fine sandy loam to 33 cm, followed by three layers of sandy clay loam from 33-135 cm, 135-173 cm, and 173-203 cm. The bottom two layers are highly calcareous (NRCS 2018).

Another large part of the project area, mainly in the eastern quarter, is mapped as Yoakran-Plains-Nutivoli complex, 1-12% slopes, a mixed soil formation of deep, fine sand eolian deposits formed on dunes and interdune settings (NRCS 2018). Yoakran soils, found on interdune landforms, make up 45% of the formation. The typical profile is a surface layer (A horizon) of fine sand to 13 cm, followed by an E horizon of fine sand from 13-64 cm, a Bt/E horizon of sandy clay from 64-90 cm, an E/B horizon of loamy fine sand from 90-168 cm, and a 2C horizon of fine sand from 168-203 cm (NRCS 2018). Plains soils, also formed on interdune settings, make up 30% of the complex. The typical profile is a surface layer (A horizon) of fine sand to 56 cm, followed by an E horizon of fine sand from 56-104 cm, an E/B horizon of loamy fine sand from 104-132 cm, a Bt/E horizon of sandy clay from 132-180 cm, and a 2C horizon of fine sand from 180-203 cm (NRCS 2018). Finally, Nutivoli soils are formed on dunes, have a 3-12% slope, and make up 20% of the formation. The typical profile is a surface layer (A horizon) of fine sand to 25 cm, followed by a C1 horizon of fine sand from 25-120 cm, and a C2 horizon of fine sand from 120-203 cm (NRCS 2018).

A small part of the project area within the draw basin is mapped as Midessa fine sandy loam, 3-8% slopes (NRCS 2018). These soils formed in calcareous, loamy eolian and lacustrine (pond) deposits derived from the Tahoka and Blackwater Draw Formations of Pleistocene age; they are formed on nearly level to strongly sloping plains, playa slopes,

and draws with slopes ranging from 0-12%. The typical profile is an A horizon of loamy fine sand to 18 cm, followed by three B horizons of calcareous sandy clay loam from 18-74 cm, 74-152 cm, and 152-203 cm (NRCS 2018).

These soils tend to support a native rangeland composed mainly of sand drop-seed, hooded windmill grass, black and blue grama and threeawn interspersed with stands of yucca and sagebrush. Other plants include catclaw and relatively short mesquite, and in places low, dense patches of shinnery oak (Dittemore Jr., 1964).

The large game animals of the region at present include white tail and mule deer, while bison ranged here historically. The playa basins are seasonal feeding grounds for cranes, ducks and geese, while the grasslands would be home to game birds including the Lesser Prairie-Chicken and quail. Rabbits, badgers, and ground squirrels are common as are coyotes and bobcats. Pleistocene megafauna including mammoths, extinct bison, horses, and camelids would have ranged in the region during the end of the Pleistocene and earliest part of the Holocene era and been drawn to watering holes such as the draws and playa lakes (Johnson and Holliday 2004:285-286).

CULTURAL BACKGROUND

Due to the lack of systematic investigations in the Southern High Plains along the western edge of the Texas Panhandle, the occupational cultural sequence of the WMA remains uncertain beyond the general outline of Paleoindian, Archaic, Ceramic/Late Prehistoric, Protohistoric, and Historic Periods (Johnson and Holliday 2004:284), which is largely reliant on sites and dates from areas well to the north and northeast of the WMA. The western edge of the Texas

Panhandle is within a cultural transition zone between the cultural sequences in the Southeastern New Mexico (Leslie 1978), and those in Central Texas (Prewitt 1981, 1983) and the lower Rolling Redbed Plains (Boyd 1997, 2004). Comparison of the various spear, dart, and arrow point forms from these areas indicates fairly radically different hunting assemblages were used by people living to the east and west of the present project area throughout most of prehistory.

There is increasing evidence for occupation of the Americas, including Texas, prior to 11,500 uncalibrated radiocarbon years before present (BP), or roughly 13,200 calibrated years BP (Johnson and Holliday 2004:284; note that all Johnson and Holliday dates cited below are uncalibrated). However, the widely accepted cultural sequence for the Southern High Plains begins with the Paleoindian period, starting around 11,500 BP and ending 8,500 BP. This is at the end of the Pleistocene and earliest parts of the Holocene, when the various draws and playa lakes across the southern High Plains were in the earliest stages of drying out, and still served as dependable water sources.

During the earliest parts of the Paleoindian period, now extinct megafauna including mammoth, bison, and horses ranged across the Plains, and were hunted and scavenged by the inhabitants using distinct fluted point types such as Clovis and Folsom; the Clovis type site (Blackwater Draw Locality #1) is located roughly 120 km north-northwest of the WMA. The Clovis subperiod dates from 11,500 to 11,000 BP, and is followed by the Folsom subperiod, a time of intensive bison hunting from 10,800 to 10,300 BP (Johnson and Holliday 2004:285-286). The Late Paleoindian subperiod is marked by the extinction of megafauna but continued hunting of the smaller modern bison using unfluted lanceolate points such as Plainview

(roughly 10,000 to 9,000 BP) and Firstview (roughly 9,000 to 8,500 BP; Johnson and Holliday 2004:285-288).

The environmental changes over the course of the Paleoindian period were significant, as the Late Pleistocene Ice Age ended. A warming, drying trend that began during Folsom times intensified, decreasing the effective precipitation and increasing maximum summer temperatures; periodic droughts ensued, surface water sources became less reliable and more seasonal, and vegetation began to shift. The drying trend also resulted in the onset of eolian sediments in draws and the formation of dunes on the uplands (Johnson and Holliday 2004:287). These changes resulted in a drastically different environmental setting in the Southern High Plains at the end of the Paleoindian period than when the earliest occupants arrived.

The Archaic period, which dates from 8,500 to 2,000 BP in the southern High Plains, is relatively poorly known. This is especially applicable to the Early Archaic, 8,500 to 6,500 BP, with data from only two excavated sites (Johnson and Holliday 2004:290). Subsistence activity seems to have changed little from the preceding Late Paleoindian other than projectile point styles (although no temporally diagnostic types were recovered from these sites), with a continuation of the hunting of small herds of bison.

The warming and drying trend of the Late Paleoindian period continued throughout most of the Archaic, with desiccation of draws, reduced surface water, and eolian sedimentation of valleys and playas resulting in an increasingly harsh landscape. Peak aridity occurred between 6,500 and 4,500 BP in a period known as the Altithermal. This hot, dry, dusty time coincides with the Middle Archaic period in the Southern

High Plains. A number of Middle Archaic occupation sites have been excavated. At the Blackwater Draw Locality #1 Site and Mustang Springs site, multiple wells were discovered, indicating both the falling water tables and the Middle Archaic response to the harsh conditions (Johnson and Holliday 2004:291; Allday and Tinsley 2011:21). The Lubbock Lake site, situated at a spring-fed locality and with occupations dating back to the Clovis period, yielded at least 28 activity areas. Among these was a large pit oven capped with burned caliche cobbles, radiocarbon dated to 4,800 BP. This feature, along with a worn sandstone metate found among the caliche cobbles, is evidence of the processing of vegetal materials as part of subsistence (Johnson and Holliday 2004:291).

The Late Archaic (4,500 to 2,000 BP) sees a gradual return to cooler and more moist conditions, resulting in more extensive surface water sources, more stable mixed-grass prairie vegetation, and improved range conditions. An increase in site densities during the Late Archaic is interpreted as an expanding population, likely in part due to the improved conditions allowing more effective exploitation of the landscape and long-term occupations rather than a highly mobile population (Johnson and Holliday 2004:291; Allday and Tinsley 2011:21). Occupations continue to include burned caliche scatters, lithic reduction activities using raw materials from both local and non-local sources, and grinding implements related to vegetal processing. Bison kill sites are also present (Johnson and Holliday 2004:292; Allday and Tinsley 2011:21). One site near Palo Duro Canyon yielded a wide variety of stone tools, including scrapers, gouges, graters, and drills. Projectile point types included Ellis, Refugio, Palmillas, and Lange. This site also yielded two shell pendant fragments

(Allday and Tinsley 2011:21), which are also a distinctive material trait of the Late Archaic in Central Texas (Collins 2004:121-122).

The Ceramic period begins around 2,000 BP and is characterized by the adoption of pottery, bow-and-arrow technology, and (in some places) horticulture, although there is a fairly long transitional period from the traditional Archaic lifeways and dart point technology (Johnson and Holliday 2004:292; Allday and Tinsley 2011:22). Researchers have divided the Ceramic period into two cultural complexes. The first of these, the Palo Duro complex, extends until roughly 1,000 BP and includes sites with dart points, Deadman and Scallorn arrow points, and Mogollon brownware pottery from southern New Mexico (Johnson and Holliday 2004:292; Allday and Tinsley 2011:22). The second is the Antelope Creek phase, dating from roughly 1,000 to 500 BP, and characterized by Berger cordmarked ceramics, slab-lined structures, and small triangular arrow points, a mixture of Puebloan pottery types and Plains lithic tools (Johnson and Holliday 2004:293; Allday and Tinsley 2011:22). Sites include both temporary campsites and more permanent village sites, particularly in Palo Duro Canyon; several burials from this period have also been identified in rockshelters in Palo Duro Canyon (Allday and Tinsley 2011:22).

Around 500 years BP, an influx of Apache into the region and a drought resulted in the displacement of the Antelope Creek people. The Apache were largely nomadic bison hunters, with only a few groups living in villages with limited horticulture. Diagnostic artifacts include pottery similar to that of the eastern and northern Pueblos, obsidian, turquoise, and other trade items from New Mexico, tiny triangular arrow points, and small end scrapers (Allday and Tinsley 2011:22).

The Protohistoric-Historic Indian period begins with the Apache entrance into the region discussed above, roughly AD 1450, through the initial European contact of the Coronado expedition in AD 1541, and continues until AD 1874, when the final battle of the Red River War resulted in the defeat of the Comanche and Kiowa and their resettlement onto reservations in the Indian Territory (Johnson and Holliday 2004:293-294; Allday and Tinsley 2011:22-24). Several different regional complexes are present during the earliest part of this period, including the Edwards complex in west-central Oklahoma, the Tierra Blanca Complex along the Prairie Dog Town Fork of the Red River, and the Garza complex east of Lubbock (Allday and Tinsley 2011:23). There are few distinctions in the arrow point assemblages from these complexes, with Fresno, Washita, and Harrell types common at all; Garza and Lott arrow points are one marker of sites from the Garza Complex. Of the three, the Garza complex lacks evidence of permanent structures, and has the strongest affiliation with Puebloan groups in the Southwest, based on artifact assemblages. The Garza complex sites would be the closest to the WMA.

By the early 1700s, the Comanche had forced the Apache out of the region, pushing them to the south. The Comanche came from the north, and were extremely proficient horsemen, a notable advantage over other groups. They also were likely able to cut the Apache off from trade routes with French and English traders to the north and east, limiting the Apache supply of guns (Allday and Tinsley 2011:23). Comanche sites are identifiable in part by the presence of both Native and European/American goods, including metal tools and European glass seed beads, as well as horse remains (Johnson and Holliday 2004:293; Allday and Tinsley 2011:23).

Traders known as Comancheros became active in the region in the early 1800s and set up some trading posts to acquire buffalo hides and horses from the Comanche in exchange for guns and other European goods (Allday and Tinsley 2011:23).

After years of raids by the Comanche against Spanish/Mexican/Texian settlers, battles with Texas Rangers and the US Army, and negotiated and broken treaties, the Red River War of 1874 resulted in the final defeat of the Comanche and their resettlement into the Indian Territory (Allday and Tinsley 2011:24). Following this, Euro-American occupation of the Southern High Plains began in earnest.

The first wave of settlement was by Hispanic shepherders from New Mexico, known as pastores. They built sheep camps and corrals across the region and began settling in and along the Canadian River valley in the early 1870. Within a few years, they had established small settlements, including along tributaries to the Red and Brazos Rivers. These were short-lived, and by the mid-1880s the pastores returned to New Mexico (Johnson and Holliday 2004: 293; Allday and Tinsley 2011:24).

The ultimate settlement of the Southern High Plains by Anglo-Americans included cattlemen and sheepmen, some of whom established large ranch holdings, including Charles Goodnight's JA Ranch in Palo Duro Canyon and surroundings (Allday and Tinsley 2011:24-25) and the 3-million ac XIT Ranch, which included much of Cochran County (Leffler 2017).

Small dry-land farmers also moved into the Southern High Plains establishing homesteads, although the large ranch holdings in Cochran County made homesteading difficult. The 1900 census showed only 25 residents of Cochran County,

and even by 1920 there were only 14 ranches and farms and only 67 residents (Leffler 2017). In 1921, when the large Slaughter ranch was dissolved and land sold to farmers, the population began to grow, and as farmers began to tap groundwater sources to irrigate fields in the dry climate, there was a small population boom. By 1930, there were 285 farms and ranches and 1,963 residents of the county. Several towns were also established during this decade (Leffler 2017).

Oil was discovered in Cochran County in 1936, helping the area economy weather the Great Depression and the Dust Bowl; by the end of World War II, the oil business was booming and continues to be a major factor in the county and the region. Agriculture also grew, although over time the land has been consolidated into larger farming concerns resulting in population loss despite continued agricultural production. The population of the county peaked at 6,417 residents in 1960 and stood at 2,935 as of 2014 (Leffler 2017).

Previous Investigations

Few archeological sites are recorded from the four counties surrounding the WMA. According to the Texas Archeological Sites Atlas electronic site files, two previously recorded archeological sites are present in Hockley and Yoakum Counties, three in Cochran County, and 31 sites are present in Terry County, mostly reported by a single avocational collector. The recorded sites range from an unpublished Paleoindian (Clovis affiliation) site in Hockley County to a historic period Native American burial in Yoakum County (Suhm 1962). The nearest recorded archeological site to any of the WMA properties is site 41CQ1, a Late Ceramic campsite with brownware pottery and side notched (Harrell type) arrow points located only some 2.5 km east of the HQ.

Many of the archeological sites recorded in Terry County reflect a concentration of prehistoric occupations around the edges of playa lake basins. However, site occurrences along the margins of draws and arroyos crossing the Southern High Plains have been documented by Kibler (1991) for Gaines County to the south. Kibler's settlement pattern might apply to the south fork of Sulphur Draw that crosses the northwestern portion of the WMA in Cochran County near the current project area.

Few professional archeological survey or excavation projects have occurred in the four counties in and around the WMA, and little information is available beyond the date and federal/state agency requiring the survey work. Most archeological projects conducted by contracting firms were conducted in compliance with Federal Energy Regulatory Commission (pipelines and well pads), with a few projects that comply with Federal Highway Administration (road improvements) or more recently Environmental Protection Agency (storm water run-off; perhaps associated with wind turbine farms). No substantial excavations have occurred on sites within the four counties adjacent to the WMA, with the exception of the salvage of a historic Native American burial in Yoakum County (Suhm 1962).

Five projects have been conducted by professional archeologists within the limits of the WMA. The first was a 2008 intensive pedestrian survey of the Roadrunner Pipeline project crossing the western edge of the Yoakum Dunes Tract (Goar 2008), prior to the land acquisition by TPWD. No archeological sites were documented in the WMA portion of the pipeline right-of-way.

In 2015, Chris Lintz surveyed 1.13 ac along the eastern boundary of the WMA adjacent to CR 1780, for a proposed WMA

headquarters complex (Lintz 2016). No cultural resources were encountered during the intensive pedestrian survey of this area, which included five shovel tests (Lintz 2016). This proposed HQ area was subsequently deemed unsuitable due to proximity to important Lesser Prairie-Chicken mating grounds. A new HQ location, located roughly 8 km north of the WMA proper, was then identified. An intensive pedestrian survey of this parcel identified a small Early Ceramic campsite, 41CQ2, on a disturbed well pad site along the southern boundary of the parcel. Two shovel tests were excavated within the artifact scatter, but both were negative for cultural materials. Temporally diagnostic artifacts included a Scallorn arrow point fragment made from Alibates agate and a gray, polished, quartz tempered ceramic body sherd of unknown origin. Other artifacts included three burned sandstone and two burned caliche chunks, a chert graver, two Edwards chert edge modified flakes, two Edwards chert flakes, a Potter chert flake, a black quartzite flake, and a red quartzite tested cobble (Lintz 2016). No recommendation of eligibility was made for the site, which was avoided by the project. The site continues onto privately held lands.

In March 2017, the author conducted two large area surveys at the WMA. The larger of these was an intensive pedestrian survey of 185 ac for a proposed 173 ac grassland habitat restoration aeration area in the northeast corner of the WMA (Lowe 2017a). A total of 106 shovel tests was excavated across the survey area, including one within an archeological site; all were negative for cultural materials. Site 41CQ3, a small prehistoric open campsite with a possible hearth feature, was recorded during the survey. The small artifact assemblage from the site includes seven pieces of lithic debitage, the dart point fragment (which was

collected), and roughly 30 pieces of probable lightly burned mudstone rock, mainly in the feature cluster. Six of the flakes and the dart point fragment are mainly Edwards chert, while the other piece of debitage is Alibates agate. The site was not recommended for official designation as a State Antiquities Landmark (SAL), because it does not meet SAL Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). It was recommended as not eligible for listing on the National Register of Historic Places (NRHP) under Criterion D. No avoidance was recommended for this site (Lowe 2017a).

The smaller area survey project consisted of an intensive pedestrian survey of 65.4 ac of proposed grassland habitat restoration grubbing area, south of the larger aeration project area. All 43 shovel tests excavated across the survey area were negative for cultural materials, and no cultural resources were encountered within the project area (Lowe 2017b). The easternmost 22 ac of the current project area are immediately south of this area, while another portion of the current project area is directly to the west.

During the same March 2017 field visit, Lowe also conducted an intensive pedestrian survey for a proposed new access road. The proposed project APE included a 2.7-km long, 18-m wide area along a fenceline; at the time of the survey, the access road APE was privately held, and the landowner had agreed to allow Lowe to access the property for the survey. Over the course of the survey, 27 shovel tests were excavated; all were negative for cultural materials.

METHODS

TPWD conducted an intensive pedestrian survey of roughly 192 ac of proposed grubbing project area over two sessions,

from 23-27 January and 06-09 February 2018. The author walked 30 m interval transects in varying directions due to the oddly shaped project area. In many cases, transects were north-south or a few degrees off north-south, following fence lines within the larger WMA. Shovel tests were excavated arbitrarily across the project areas to assess potential for buried cultural deposits, with priority on higher-probability locations close to or within the draw basin and depressions depicted on the topographic map.

Shovel tests measured 30 cm x 30 cm and were dug to a target depth of 50 cm, generally meeting the anticipated depths of impact, which will rarely exceed 50 cm. All sediments were screened through ¼" mesh screen. The soil colors, textures, and inclusions from each shovel test were recorded on a shovel test log. Each shovel test location was recorded using a Trimble GeoXT GPS unit. All shovel tests were backfilled following recording.

Over the course of the pedestrian survey, 156 shovel tests were excavated across the project area. The THC minimum survey standards for a project of this size (101-200 ac) calls for one shovel test for every three acres, or 64 total tests. The current investigations significantly exceeded this standard, and TPWD made a good faith effort to identify and focus testing on areas with the highest likelihood for cultural deposits.

All sites, isolated finds, and features were documented using photographs, field notes, and a GPS point. Due to the limited amount of previous work in the area, a low threshold for distinguishing a site from an isolated find was in use for this project. A density of one artifact per square meter, with a minimum of six artifacts, was selected as the requirement for determining a site. The presence of burned rock, chipped stone tools or a variety of artifact types could also

be a determining factor. Non-diagnostic isolated historic artifacts and prehistoric lithic debitage, following an examination of the ground surface in the vicinity, were noted but not documented. Temporally diagnostic artifacts, artifacts believed to be at risk of uncontrolled collection, and artifacts recovered from shovel tests were collected and curated in the TPWD Archeology Lab curatorial facility.

RESULTS

The winter weather was generally cold and sunny, with mornings starting below freezing and warming into the 50s; this time period was specifically selected for the survey in order to avoid the multiple encounters with rattlesnakes that occurred during the March 2017 surveys. Despite the limited development at WMA, access to most all portions of the survey area was available via dirt ranch and fenceline roads, allowing for reasonably efficient transect survey.

The survey was conducted in 30 m interval transects, in varying directions due to the oddly shaped project area. In many cases, transects were north-south or a few degrees off north-south, following fence lines within the larger WMA. Shovel tests were excavated arbitrarily across the project areas to assess potential for buried cultural deposits, with priority on higher-probability locations close to or within the draw basin and depressions depicted on the topo map. All told, the current survey investigated roughly 192 ac.

The survey area is largely on a gently rolling, mostly level upland prairie (Figure 3). A few low dunes were present in the southern part of the survey area, although the project area is seemingly designed to avoid the dune settings. The elevation difference was marginal, no more than 2 m. Coyote burrows were very common in these settings. Much



Figure 3. Typical prairie overview in project area. View to east.

of the project area is within or adjacent to the draw basin, which has mainly gently sloping valley walls (Figure 4). There are no playa lakes in or adjacent to the survey area, although there are several minor depressions within or adjacent to the project area. As noted above, most archeological sites in the region have been recorded within or along the margins of arroyos and draws, or of playa lakes, indicating a relatively good potential for cultural materials.



Figure 4. Typical valley margin slope. View to south.

Vegetation was consistent with the modern Southern High Plains, described above. On the ground, three general types of vegetation groupings were encountered. These were areas with low, dense shinnery oak and honey mesquite scrub, thick clumps of bunchgrasses, or most commonly mixed grasses and forbs, mesquite, and occasional yucca (Figure 5). These generally reflected



Figure 5. Representative mixed vegetation setting with grasses, shinnery oak, and honey mesquite. View to north.

the sandiness and level of erosion of the areas. Ground visibility varied with the vegetation. In the areas of dense shin oak or thick clumps of bunchgrass, visibility was in the 20% range, with patchier areas of high visibility as well as burrow spoil. In the mixed vegetation areas, generally along the upland edge and side slopes, surface visibility was much higher, commonly 50-85%.

Disturbances within the project area were common and primarily related to bioturbation by rodents, rabbits, and coyotes. Erosion was evident in some places, likely resulting from previous vegetation clearing, ranching activities, old roads, and game trails. In

some areas, erosion led to large blowouts. The dirt roads within the project area have been graded in some areas to depths as great as 50 cm and have also undergone some erosion. A maintained pipeline corridor is present in the southeastern-most portion of the project area.

Over the course of the survey, 156 shovel tests were excavated (Figure 6); all but seven of these were negative for cultural materials. The seven positive tests are associated with two archeological sites. Tests were excavated at somewhat arbitrary intervals, with a general goal of staggering tests across transects to ensure few gaps in shovel test coverage. Shorter intervals were used in areas closer to the drainage basin, particularly where the mapped drainage channel was in relative proximity.

basin encountered brown (7.5YR 4/4 to 7.5YR 5/4) soils with caliche pebbles; caliche pebbles were often observed in the lowest parts of the drainage basin. This is consistent with the Midessa soils referenced above, and proximity to the Ogallala geological formation.

Two archeological sites, 41CQ4 and 41CQ5, and one isolated find were documented during the survey.

41CQ4

Site 41CQ4 is a small prehistoric open campsite located in the northern part of the WMA. The site is situated on the edge of the southern valley margin of the south branch of Sulphur Draw; the draw is dry and has been so for a long time.



Figure 6. Recent aerial imagery showing detail of survey area.

The results were remarkably consistent with the geology and soil descriptions for the survey area. Most tests encountered reddish brown (5YR 4/3 to 5YR 5/4) sandy loam to depths ranging from 40 to 50 cm below surface (cmbs). Below this was a reddish brown (2.5YR 4/4 to 2.5YR 5/4) sandy clay loam that became increasingly compact (Figure 7). Note that soil colors may differ from the official soil surveys due to the long-term drought. A few tests in the drainage

Vegetation consisted of sparse short grasses in the eroded areas, with mixed grasses, shin oak, and mesquite scrub on the surrounding intact areas. Ground surface visibility was generally high, ranging from 40 to 100%. Soils were largely absent in the main part of the site. In the areas adjacent to the eroded section, the soils were reddish brown sandy loam to between 40 and 50 cmbs, overlying roughly 10 cm of reddish brown sandy clay loam, terminating at red sandy clay.



Figure 7. Erosional cut profile showing representative soils encountered in shovel tests.



Figure 8. Site 41CQ4 FCR scatter in erosional wash floor and wall. View to southeast.

Site 41CQ4 was initially discovered when a large caliche cobble was observed on the surface in an erosional cut/wash. An extensive inspection of the surface in the area was conducted, and additional artifacts were identified. This included a number of angular caliche chunks, including a cluster that was designated as a feature (Figure 8). A single shovel test (G59) was excavated in a less eroded area just above the feature, near where possible in situ rocks were observed in the cut profile. This test was positive, with a small chunk of probably burned caliche recovered at 10-20 cmbs; it should be noted that this test was in a spot roughly 30 cm below the more intact natural surface level to the southeast. Additional tests were excavated in the intact areas to the southeast and northwest of the cultural materials in the wash. One of these (G78), roughly 10 m northwest, was positive for a chert flake at 20-30 cmbs. The other two (G79 and G80) were negative and used to delineate the site boundaries.

The site measures 23 m north-south and 19 m east-west, based on the extent of the artifact scatter (Figure 9). The artifact assemblage includes nine pieces of chert debitage and roughly 20-25 pieces of burned caliche. Most of the artifacts were on the ground surface in a heavily eroded context. All the flakes are chert, mainly of a color and quality generally associated with material from the Edwards Plateau. There is no evidence of modification or utilization on any of the flakes. The materials are non-local and

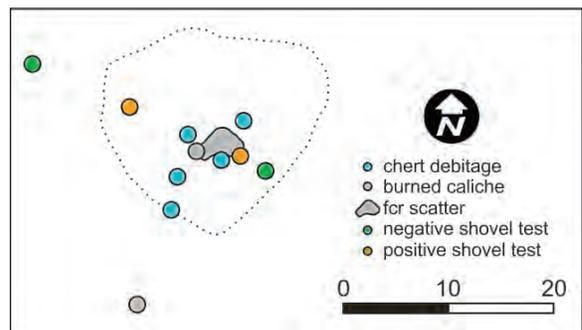


Figure 9. Site 41CQ4 sketch map.

originated at least 250 km southeast of the site. No lithic artifacts diagnostic of a distinct temporal period, pottery, faunal remains, or datable organic material was noted.

Site 41CQ4 is a small, sparse open campsite that dates to the broad Prehistoric period, although likely to the Archaic based on the lack of pottery. Cultural materials were primarily recovered from the eroded wash surface, but two of the four shovel tests excavated within the site were also positive for cultural materials. The research potential of the site is considered to be moderately low, as much of the site is badly eroded; although, some buried deposits exist within an eolian sandy matrix. However, the site has a limited, only broadly diagnostic artifact assemblage and little potential for datable organic remains or significant cultural deposits. Site 41CQ4 is not recommended for official designation as a SAL, because it does not meet SAL Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). It is recommended as not eligible for listing on the NRHP under Criterion D. However, avoidance by heavy equipment is recommended for this site in order to protect the limited buried material. Hand cutting of mesquite to ground surface would be permissible, if suitable for the project.

41CQ5

Site 41CQ5 is a large, somewhat diffuse prehistoric open campsite located in the northern part of the WMA. The site is situated on the edge of the southern valley margin of the south branch of Sulphur Draw. Site 41CQ4 is along the same valley margin less than 1.6 km to the east.

Vegetation consisted of mixed grasses and forbs, honey mesquite, and some shin oak scrub. Ground surface visibility was mixed,

alternating between areas of relatively dense grasses and brush with 10-30% visibility to eroded areas along the landform edges and in blowouts with more sparse grass and brush and high (50-100%) visibility. Soils also varied throughout the site. On the main landform, most tests encountered reddish brown sandy loam at depths of 30-60 cmbs overlying 10-15 cm of dark reddish brown sandy clay loam, terminating at compact red clay. Along the upland edge and on the side slopes, erosion has resulted in the sandy loam topsoil being only 10-20 cm thick, overlying 10-20 cm of sandy clay loam.

The site is primarily on a slight rise at the edge of the valley margin (Figure 10), although materials are also present in a blowout southeast of the rise. A dirt ranch road crosses the site, starting at the northeast corner and running west to southwest. Vegetation is largely mixed grasses and honey mesquite. Some erosion is present, primarily on the northern edge of the landform/site and the southeast blowout area.



Figure 10. Site 41CQ5 slight rise overview. View to east.

Site 41CQ5 was initially discovered when several flakes were observed on the surface in a blowout (Figure 11); these would eventually be recorded as Feature 1. An extensive inspection of the surface in the blowout was conducted, and additional artifacts were identified, including two prehistoric potsherds. At this time, the author decided to continue with the transect survey, in order to identify additional artifacts associated with the site outside of the blowout, and to facilitate completion of the survey.



Figure 11. Site 41CQ5, Feature 2 artifact concentration in blowout. Artifacts flagged in foreground are southernmost artifacts in scatter. View to north.

As the survey continued, additional artifacts were observed on the surface and marked with orange flagging for future recording. Shovel testing was intensified slightly across the rise, and several positive shovel tests were excavated as part of the transect survey, along with several negative shovel tests. After the survey of the project area was completed, the author returned to the site area to fully document the finds and conduct additional shovel testing.

Sixteen shovel tests are within or adjacent to the site 41CQ5 boundaries. Five of these were positive for cultural materials, including three transect tests and two of seven site-specific tests (G102-G104, YD3-4, YD3-6). Artifacts recovered from shovel testing include six chert flakes (two tests had two flakes each) and one decorated potsherd. Two of the flakes were recovered at 0-10 cmbs, the sherd and one flake at 10-20 cmbs, a flake at 20-30 cmbs, and two flakes at 30-40 cmbs. All were recovered from the eolian sandy loam layer. Additional tests were not excavated due to the high level of ground visibility, shallow soils, perceived level of erosion, and having established the site boundaries.

The site measures 220 m northeast-southwest and 100 m southeast-northwest based on the extent of the artifact scatter and shovel testing (Figure 12). The observed artifact assemblage includes an estimated 35-40 pieces of lithic debitage (including flakes and shatter), 2 cores, 4 potsherds, and roughly 20 pieces of fire-cracked caliche, primarily small chunks associated with a feature. Except for the seven artifacts described in the previous paragraph, all artifacts were on the ground surface, and many may have been dispersed by previous land use activities and erosion.

Three features were delineated at the site, all in the eastern part.

Feature 1 is a lithic concentration that covers an area 5 m north-south and 3.5 m east-west, within a blowout in the southeast corner of the site. The concentration includes at least a dozen flakes, half of which are chert microdebitage (Figure 13), a gray quartzite biface thinning flake, two Alibates agate flakes, and a coarse quartzite shatter. The artifacts were on the eroded base and sloping edges of the blowout; some were partially covered in fine windblown sand.

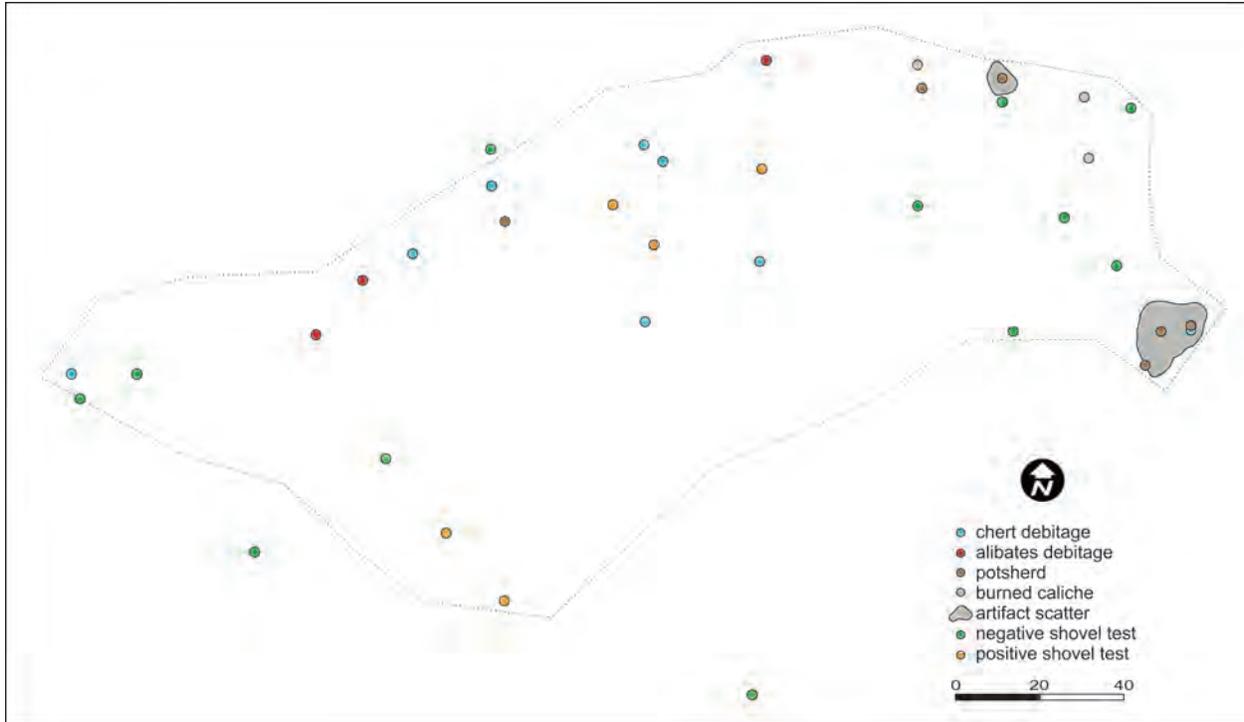


Figure 12. Sketch map of site 41CQ5.

Feature 2 is a larger, more dispersed artifact scatter within the blowout (see Figure 11); Feature 1 is a part of this larger feature. The feature measures 16.5 m north-south and 14 m east-west and covers much of the blowout area. In addition to the artifacts associated with Feature 1, the observed assemblage includes 10-12 additional pieces of chert debitage, a burned caliche chunk, a quartzite probable core, and two potsherds. The potsherds were collected and are discussed below.



Figure 13. Sample of chert microdebitage from Feature 1 at 41CQ5.

Feature 3 is a FCR and lithic scatter measuring 8.5 m north-south and 5 m east-west. The feature consists of a dozen or so fire-cracked caliche, mostly 5 cm or less, somewhat diffusely scattered but more on the upslope side of an eroded upland edge. The chipped stone artifacts include 8-10 flakes, mainly chert along with a couple quartzite, more in the downslope part of the eroded upland edge.

The observed lithic artifact assemblage includes 30-40 flakes, primarily in the artifact concentration features. The majority of these are chert, likely from the Edwards plateau, and includes several pieces of microdebitage, suggesting late stage tool reduction and/or resharpening. Other raw material types include six pieces of Alibates agate debitage, including a shatter, and four pieces of quartzite, including a possible core, and a chalcedony core and flake. No tools were observed. There is no evidence

of modification or utilization on any of the flakes. The materials are non-local, excluding perhaps the quartzite. The majority of the raw material comes from non-local sources, including from the Edwards Plateau, located roughly 250 km to the southeast, and the Alibates agatized dolomite source 280 km to the northeast.

More significantly, four potsherds were recovered from the site, with three coming from the surface and one from a shovel test (Figure 14). Two of the sherds are brushed/

corrugated/cordmarked with smoothed opposite sides, and one has some white that may be eroded slip. One is plain brownware, with a smoothed exterior, and the final sherd is heavily eroded. The potsherds are likely from vessel types associated with the Jornada Mogollon brownware, although expert identification and analysis is needed. This type of ware is associated with the Ceramic Period Palo Duro complex, which extends from roughly 2,000 to 1,000 BP.



Figure 14. Site 41CQ5, prehistoric pottery assemblage. Top: Exterior face; Bottom: Interior face. Note brushing on leftmost and rightmost sherds, possible slip on leftmost exterior.

No lithic artifacts diagnostic of a distinct temporal period, faunal remains, or datable organic material were noted.

Site 41CQ5 is a large but dispersed open campsite that may represent a group campsite, or several small occupations, at least one of which dated to the Palo Duro Complex era from 2,000 to 1,000 BP. The upland soils are eolian sand sheets, and extensive surface artifacts reflect both erosion and bioturbation (primarily animal burrowing). The research potential of the site is moderate to moderately low. Much of the site is badly eroded, although some buried deposits exist within an eolian sandy matrix, including temporally diagnostic artifacts. However, due to the nature of the sandy matrix, there is less potential for datable organic remains or significant cultural deposits. Site 41CQ5 is recommended as unknown for official designation as a SAL, as further testing would be required to determine if the site meets SAL Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). Likewise, the eligibility for listing on the NRHP under Criterion D is unknown. More shovel testing and possibly limited Phase II testing would be needed to further evaluate the site deposits for integrity and research potential. For this reason, avoidance is recommended for this site, including a 5 m buffer around the site boundaries. No hand-cutting is permitted, to prevent/slow further erosion from loss of ground cover and tree roots.

Isolated Find

Isolated Find (IF) 2 is a white chalcedony flake scraper. The lateral edges on both sides of the dorsal face have been retouched along essentially the entire margin. The edge angles are relatively steep. Examination with

a 30x loupe shows use-wear on the ventral surface along both margins and the distal section, suggesting that this may have been a multi-purpose tool. No additional items were in association with the object. This isolated find does not require any further work or avoidance within the project area.

CONCLUSION

The proposed grassland restoration project will reduce encroaching honey mesquite via mechanical grubbing and improve native bunchgrass and forb cover in a 192 ac area in the northern part of the WMA to improve nesting and brood rearing habitat for upland game birds and other grassland species. The trees will be brought down utilizing an excavator equipped with a grubbing attachment. Because the soil texture is primarily fine sand, anticipated depth of soil disturbance during tree removal will be 30-60 cm. The work will be conducted by an experienced contractor and monitored by WMA staff.

The file searches and intensive pedestrian survey of 192 ac of proposed grassland habitat restoration area found that the soils of the project area are relatively uniform sandy loam to varying degrees of depth. Much of the project area is within a moderate probability area for cultural resources, due to being within or adjacent to a drainage basin.

Over the course of the survey, 156 shovel tests were excavated; all but seven of these were negative for cultural materials. The seven positive tests are associated with two archeological sites. Tests were excavated at somewhat arbitrary intervals, with a general goal of staggering tests across transects to ensure few gaps in shovel test coverage. Shorter intervals were used in areas closer to the drainage basin, particularly where the mapped drainage channel was in relatively close proximity.

Two archeological sites and one isolated find were documented during the survey. The isolated find is a white chalcedony flake scraper.

Site 41CQ4 is a small, sparse open campsite that dates to the broad Prehistoric period; although, it likely dates to the Archaic based on the lack of pottery. Site 41CQ4 is not recommended for official designation as a SAL, because it does not meet SAL Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). It is recommended as not eligible for listing on the NRHP under Criterion D. However, avoidance by heavy equipment is recommended for this site to protect the limited buried material. Hand cutting of mesquite to ground surface would be permissible, if suitable for the project.

Site 41CQ5 is a large but dispersed open campsite that may represent a group campsite, or several small occupations, at least one of which dated to the Palo Duro Complex era from 2,000 to 1,000 BP. The research potential of the site is considered to be moderate to moderately low. Much of site is badly eroded, although some buried deposits exist within an eolian sandy matrix, including temporally diagnostic artifacts. However, due to the nature of the sandy matrix, there is less potential for datable organic remains or significant cultural deposits. Site 41CQ5 is recommended as unknown for official designation as a SAL, as further testing would be required to determine if the site meets SAL Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). Likewise, the eligibility for listing on the NRHP under Criterion D is unknown. More shovel testing and possibly limited Phase II testing would be needed

to further evaluate the site deposits for integrity and research potential. For this reason, avoidance is recommended for this site, including a 5 m buffer around the site boundaries. No hand-cutting is permitted, in order to prevent/slow further erosion from loss of ground cover and tree roots.

THC concurred that, by following the cultural resources avoidance recommendations above, the grassland habitat restoration project should have no adverse effect on the cultural resource base at the WMA. TPWD further recommended, and THC concurred, that if any additional cultural deposits or features are encountered during the project then work should halt in the immediate area of the possible archeological site and a professional archeologist be called to document the nature of the unanticipated discovery. If the cultural deposits or features are determined to be more than 50 years old, then further consultation will be conducted with the THC to ensure that the resources have been documented and impacts mitigated.

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Appendix

Texas Historical Commission
Coordination Documentation

INTRODUCTION

At the request of Texas Historical Commission (THC), this appendix includes coordination documentation for individual projects that required their external review. Three exceptions are for those projects where Texas Department of Transportation (TxDOT) reviewed the project in lieu of THC per a programmatic agreement among Federal Highway Administration (FHWA), TxDOT, Texas State Historic Preservation Office, and the Advisory Council on Historic Preservation regarding projects that receive FHWA funds. In these instances, a verification memo from TxDOT is presented.

It was determined the best way to provide proof of project coordination was to present the response email for projects that were submitted via the new online submission manner. Each project, then, is represented by a single page with a heading for the TPWD property and the response email below the heading. As in the body of the report, the TPWD properties are presented in alphabetical order:

Cedar Hill State Park

Chaparral Wildlife Management Area

Colorado Bend State Park

Government Canyon State Natural Area

Guadalupe River State Park

McGillivray and Leona McKie Muse Wildlife Management Area

Nannie M. Stringfellow Wildlife Management Area

Roger R. Fawcett Wildlife Management Area (1)

Roger R. Fawcett Wildlife Management Area (2)

Roger R. Fawcett Wildlife Management Area (3)

Roger R. Fawcett Wildlife Management Area (4)

San Jacinto Battleground State Historic Site

South Llano River State Park

Yoakum Dunes Wildlife Management Area

CEDAR HILL STATE PARK



MEMO

October 3, 2018

To: 850 File, Various Road Projects, Various CSJs, Various Districts

From: Scott Pletka, Ph.D.

Subject: Internal review under the First Amended Programmatic Agreement Among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU), and internal review under the Memorandum of Understanding (MOU) Between the Texas Historical Commission and the Texas Department of Transportation

Listed below are the projects reviewed internally by qualified TxDOT archeologists from 9/27/18 to 10/3/18. The projects will have no effect on archeological historic properties. As provided under the PA-TU, consultation with the Texas State Historic Preservation Officer is not necessary for these undertakings. As provided under the MOU, the proposed projects do not require individual coordination with the Texas Historical Commission.

CSJ	DISTRICT	COUNTY	ROADWAY	DESCRIPTION	WORK PERFORMED
2222-17-032	Bryan	Freestone	Big Brown Trail	Trail Improvements	Background Study
2222-17-033	Dallas	Dallas	Talala Trail Project	Trail Construction	Survey
2222-17-034	San Angelo	Kimble	Overlook Trail Project	Trail Construction	Survey
0432-01-065	Yoakum	Calhoun	SH 185 @ Dow Chemical	Turn Lanes	Background Study
0139-05-043 0139-06-022	Odessa	Reeves	US 285	Roadway Rehabilitation, Add passing Lanes	Background Study

Signature _____

For TxDOT

cc: ECOS-Data Entry, PD, ENV_ARC: PA File

Table Template for Weekly List Memo.doc

Date: 10 / 03 / 2019

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

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OUR MISSION: Through collaboration and leadership, we deliver a safe, reliable, and integrated transportation system that enables the movement of people and goods.

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CHAPARRAL WILDLIFE MANAGEMENT AREA

John Lowe

From: noreply@thc.state.tx.us
Sent: Wednesday, July 18, 2018 11:25 AM
To: John Lowe; reviews@thc.state.tx.us
Subject: Project Review: 201810742



TEXAS HISTORICAL COMMISSION
real places telling real stories

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 8278

201810742

Chaparral WMA - 2 New Staff Residences Project
64 Chaparral WMA Drive
Cotulla, TX 78014

Dear John D. Lowe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff led by Tiffany Osburn has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- No historic properties present or affected. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: tiffany.osburn@thc.texas.gov.

Sincerely,

For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

COLORADO BEND STATE PARK

From: info_tech@the-state.tx.us [mailto:info_tech@the-state.tx.us]
Sent: Tuesday, May 22, 2018 9:57 AM
To: Michael Strutt <Michael.Strutt@trowd.texas.gov>; jrowww@the-state.tx.us
Subject: Project Review: 201809390



Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Parish 8378
201809390
Colorado Bend Septic System
P. O. Box 118
Bend, TX 76824

Dear Michael Strutt:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the Executive Director of the Texas Historical Commission (THC), pursuant to review under the Antiquities Code of Texas.

The review staff led by Tiffany Osburn and Justin Kockritz has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Program Division at 512-463-3833 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- THC SHPO concurs with information provided.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: tiffany.osburn@the.texas.gov, justin.kockritz@the.texas.gov.

Sincerely,



For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

GOVERNMENT CANYON STATE NATURAL AREA

From: info_tech@thc.state.tx.us (mailto:info_tech@thc.state.tx.us)
Sent: Friday, February 16, 2018 12:46 PM
To: Michael Strutt <Michael.Strutt@trwd.texas.gov>; reviews@thc.state.tx.us
Subject: Project Review: 201806295



Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit S278
201806295
Joe Johnston Trail repairs
12861 Galm Rd
San Antonio, TX 78254

Dear Michael Strutt:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the Executive Director of the Texas Historical Commission (THC), pursuant to review under the Antiquities Code of Texas.

The review staff led by Casey Hanson and Justin Kockritz has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties present or affected

Archaeology Comments

- THC SHPO concurs with information provided

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: casey.hanson@the.texas.gov, justin.kockritz@the.texas.gov.

Sincerely,



For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

GUADALUPE RIVER STATE PARK

CSJ: 2222 17 027, Comal and Kendall Counties 3

May 1, 2018

inclusion in the National Register of Historic Places. The site is also not recommended for formal designation as a State Antiquities Landmark (SAL). The site does not satisfy the eligibility criteria due to its low artifact density, lack of features and intact deposits, and poor integrity.

Findings and Recommendations

While 41KE284 is not recommended as eligible for inclusion in the National Register of Historic Places or for formal SAL designation, the trail alignment in the vicinity of 41KE284 was re-routed to avoid any direct effects to the site. Based on these factors, TxDOT proposes that no archeological historic properties (36 CFR 800.16(l)) would be affected by this proposed undertaking. TxDOT recommends that the proposed project proceed to construction. If you do not object that the proposed findings and recommendations are appropriate, please sign below to indicate your concurrence. In the event that further work discloses the presence of archeological deposits, we will contact your office to continue consultation.

Thank you for your consideration of this matter. If you have any questions or have need of further information regarding this project, please contact me at (512) 416-2631.

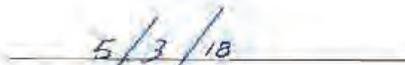
Sincerely,



Scott Pletka, Deputy Section Director
Cultural Resources Management Section
Environmental Affairs Division



Concurrence by:



Date:

Enclosure

cc w/ enclosure: ENV-ARCH ECOS

OUR GOALS
MAINTAIN A SAFE SYSTEM • ADDRESS CONGESTION • CONNECT TEXAS COMMUNITIES • BEST IN CLASS STATE AGENCY

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MCGILLIVRAY AND LEONA MCKIE MUSE WILDLIFE MANAGEMENT AREA

John Lowe

From: noreply@thc.state.tx.us
Sent: Friday, January 18, 2019 10:49 AM
To: John Lowe; reviews@thc.state.tx.us
Subject: Project Review: 201903315



TEXAS HISTORICAL COMMISSION
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Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 8278

201903315

Muse WMA 2018 Brush Units
13549 Co Rd 478
Other City, TX 76857

Dear John D. Lowe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff led by Tiffany Osburn and Caitlin Brashear has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- THC/SHPO concurs with information provided.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: tiffany.osburn@thc.texas.gov, caitlin.brashear@thc.texas.gov.

Sincerely,

For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

NANNIE M. STRINGFELLOW WILDLIFE MANAGEMENT AREA

John Lowe

From: noreply@thc.state.tx.us
Sent: Wednesday, December 12, 2018 3:13 PM
To: John Lowe
Subject: Section 106 Submission



TEXAS HISTORICAL COMMISSION
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Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
201902546
Nannie Stringfellow WMA fenceline replacement 2317 CR 316
Brazoria, TX 77422

Dear John D. Lowe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the Executive Director of the Texas Historical Commission (THC), pursuant to review under the Antiquities Code of Texas.

The review staff, led by Jeff Durst and Caitlin Brashear, has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- No effect on archeological sites. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided .
- Draft report acceptable. Please submit another copy as a final report along with shapefiles showing the area where the archeological work was conducted. Shapefiles should be submitted electronically to Archeological_projects@thc.texas.gov.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Jeff.Durst@thc.texas.gov, caitlin.brashear@thc.texas.gov.

ROGER R. FAWCETT WILDLIFE MANAGEMENT AREA (1)

John Lowe

From: noreply@thc.state.tx.us
Sent: Thursday, September 13, 2018 2:47 PM
To: John Lowe; reviews@thc.state.tx.us
Subject: Project Review: 201812908



TEXAS HISTORICAL COMMISSION
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Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 7898

201812908

Fawcett WMA Bunkhouse Replacement Project
FM 2962
Gordon, TX 76453

Dear John D. Lowe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff led by Arlo McKee and Caitlin Brashear has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- No effect on archeological sites. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- No sites recorded.
- Draft report acceptable. Please submit another copy as a final report along with shapefiles showing the area where the archeological work was conducted. Shapefiles should be submitted electronically to Archeological_projects@thc.texas.gov.

We have the following comments: Regarding above-ground resources, a survey of the of the structures will need to be submitted (as stated in the interim report) before a review of those resources can be completed. Editorial Comment: Please replace all references to "Pertulla" with "Pertula."

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Arlo.McKee@thc.texas.gov, caitlin.brashear@thc.texas.gov.

Sincerely,

ROGER R. FAWCETT WILDLIFE MANAGEMENT AREA (2)

John Lowe

From: noreply@thc.state.tx.us
Sent: Thursday, September 13, 2018 2:30 PM
To: John Lowe; reviews@thc.state.tx.us
Subject: Project Review: 201812558



TEXAS HISTORICAL COMMISSION
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Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 7898

201812558

Fawcett WMA New Office Building
FM 2692
Gordon, TX 76453

Dear John D. Lowe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff led by Arlo McKee and Caitlin Brashear has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- No historic properties present or affected. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided
- Draft report acceptable. Please submit another copy as a final report along with shapefiles showing the area where the archeological work was conducted. Shapefiles should be submitted electronically to Archeological_projects@thc.texas.gov.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Arlo.McKee@thc.texas.gov, caitlin.brashear@thc.texas.gov.

ROGER R. FAWCETT WILDLIFE MANAGEMENT AREA (3)

John Lowe

From: noreply@thc.state.tx.us
Sent: Monday, October 22, 2018 8:16 AM
To: John Lowe; reviews@thc.state.tx.us
Subject: Project Review: 201901064



TEXAS HISTORICAL COMMISSION
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Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 8278

201901064

Fawcett WMA New office building
FM 2692
Gordon, TX 76453

Dear John D. Lowe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff led by Arlo McKee has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- No historic properties present or affected. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided
- Draft report acceptable. Please submit another copy as a final report along with shapefiles showing the area where the archeological work was conducted. Shapefiles should be submitted electronically to Archeological_projects@thc.texas.gov.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Arlo.McKee@thc.texas.gov.

Sincerely,

For Mark Wolfe, State Historic Preservation Officer

ROGER R. FAWCETT WILDLIFE MANAGEMENT AREA (4)

John Lowe

From: noreply@thc.state.tx.us
Sent: Friday, January 4, 2019 11:48 AM
To: John Lowe; reviews@thc.state.tx.us
Subject: Project Review: 201902870



TEXAS HISTORICAL COMMISSION
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Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 8278

201902870

Fawcett WMA Dove Habitat Restoration Project
FM 2692
Gordon, TX 76453

Dear John D. Lowe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the Executive Director of the Texas Historical Commission (THC), pursuant to review under the Antiquities Code of Texas.

The review staff led by Arlo McKee and Caitlin Brashear has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- No effect on archeological sites. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided.
- Property/properties are not eligible for designation as State Antiquities Landmarks.
- Draft report acceptable. Please submit another copy as a final report along with shapefiles showing the area where the archeological work was conducted. Shapefiles should be submitted electronically to Archeological_projects@thc.texas.gov.

We have the following comments: In the final report, please correct the incorrect site number of "41CQ4" in the fourth paragraph of the Summary and Recommendations section. This statement should reference site 41PP420 instead.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective

SAN JACINTO BATTLEGROUND STATE HISTORIC SITE

From: Info_Tech@thc.state.tx.us [mailto:Info_Tech@thc.state.tx.us]
Sent: Tuesday, March 06, 2018 3:30 PM
To: Michael Strutt <Michael.Strutt@tpwd.texas.gov>; reviews@thc.state.tx.us
Subject: Project Review: 201806783



Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 8278
201806783
San Jacinto prairie seeding
1836 Juan Seguin Blvd
La Porte, TX 77571

Dear Michael Strutt:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the Executive Director of the Texas Historical Commission (THC), pursuant to review under the Antiquities Code of Texas.

The review staff led by Bill Martin, Justin Kockritz and Lydia Woods has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- Property/properties are eligible for listing or already listed in the National Register of Historic Places
- No adverse effects on historic properties

Archeology Comments

- No effect on archeological sites. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: bill.martin@thc.texas.gov, justin.kockritz@thc.texas.gov, lydia.woods@thc.texas.gov.

SOUTH LLANO RIVER STATE PARK



MEMO

October 3, 2018

To: 850 File, Various Road Projects, Various CSJs, Various Districts

From: Scott Pletka, Ph.D.

Subject: Internal review under the First Amended Programmatic Agreement Among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU), and internal review under the Memorandum of Understanding (MOU) Between the Texas Historical Commission and the Texas Department of Transportation

Listed below are the projects reviewed internally by qualified TxDOT archeologists from 9/27/18 to 10/3/18. The projects will have no effect on archeological historic properties. As provided under the PA-TU, consultation with the Texas State Historic Preservation Officer is not necessary for these undertakings. As provided under the MOU, the proposed projects do not require individual coordination with the Texas Historical Commission.

CSJ	DISTRICT	COUNTY	ROADWAY	DESCRIPTION	WORK PERFORMED
2222-17-032	Bryan	Freestone	Big Brown Trail	Trail Improvements	Background Study
2222-17-033	Dallas	Dallas	Talala Trail Project	Trail Construction	Survey
2222-17-034	San Angelo	Kimble	Overlook Trail Project	Trail Construction	Survey
0432-01-065	Yoakum	Calhoun	SH 185 @ Dow Chemical	Turn Lanes	Background Study
0139-05-043 0139-06-022	Odessa	Reeves	US 285	Roadway Rehabilitation, Add passing Lanes	Background Study

Signature _____

For TxDOT

cc: ECOS-Data Entry, PD, ENV_ARC: PA File

Table Template for Weekly List Memo.doc

Date: 10 / 03 / 2019

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

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OUR MISSION: Through collaboration and leadership, we deliver a safe, reliable, and integrated transportation system that enables the movement of people and goods.

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YOAKUM DUNES WILDLIFE MANAGEMENT AREA

John Lowe

From: Info_Tech@thc.state.tx.us
Sent: Monday, March 26, 2018 3:14 PM
To: John Lowe; reviews@thc.state.tx.us
Subject: Project Review: 201807647



TEXAS HISTORICAL COMMISSION
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Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 8278

201807647

Yoakum Dunes WMA Grubbing Phase II
CR 260
Sundown, TX 78744

Dear John D. Lowe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff led by David Camarena has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- No adverse effects on historic properties
- THC/SHPO concurs with information provided
- Draft report acceptable. Please submit another copy as a final report along with shapefiles showing the area where the archeological work was conducted. Shapefiles should be submitted electronically to Archeological_projects@thc.texas.gov.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: david.camarena@thc.texas.gov.

Sincerely,

For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.



State Parks Division
Cultural Resources Program
4200 Smith School Road
Austin, Texas 78744

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